

**MENTAL HEALTH PROBLEMS AND PSYCHOLOGICAL
WELL-BEING OF PEOPLE WITH HEARING DISABILITIES:
A STUDY AMONG AIMOL TRIBE OF MANIPUR**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

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A STUDY AMONG AIMOL TRIBE OF MANIPUR**

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SUBMITTED

**In partial fulfillment of the requirement of the degree of
Doctor of Philosophy in Psychology of Mizoram University, Tanhril,
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Certificate

This is to certify that the present dissertation titled, “**Mental Health Problems and Psychological Well-Being of People with Hearing Disabilities: A Study among Aimol Tribe of Manipur**” is the bonafide research conducted by Lanu Wanboy Aimol under my supervision. He worked methodologically for his dissertation which is submitted for the degree of Doctor of Philosophy under Mizoram University.

(Prof. Zokaitluangi)

Supervisor

DECLARATION

I, Lanu Wanboy Aimol, hereby declared that the subject matter of this thesis is the record of the work done by me, that the contents of this thesis did not form the basis for the award of any previous degree to me or the best of my knowledge of anybody else, and that the thesis has not been submitted by me for any research degree in any other University or Institute.

This is being submitted to Mizoram University for the Degree of Doctor of Philosophy in Psychology.

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CHAPTER- I: INTRODUCTION

Introduction:

Persons with a hearing disability ever practically encounter individual problems as well as social problems which are not experienced by normal-hearing persons that are burdened by their disabilities leaving them at risk of developing mental health problems. Research evinced enormous physical and consequences of mental problems resulting in chronic individual and social problems in their everyday life reducing their activity level (Chwalisz & Vaux, 2000; Tate et al., 1994). A person with a hearing disability undergoes psychological, physical and social consequences of being a burden to the community with high prevalence worldwide (Dalton et al., 2003; Stevens et al., 2013).

The Global Burden of Disease study estimated that the prevalence of hearing loss was 1.4 billion (18.7% of the population) in 2017 (GDB, 2017). The WHO ranked hearing loss as the third most common cause of years lost due to disability (WHO, 2020). About 2.21% of the Indian population was afflicted with a disability (2011 Census of India), and the three most common disabilities were locomotors at 20%, vision at 19% and hearing at 19% (MOSPI, 2016).

Community-based studies on all age groups demonstrated that the hearing loss prevalence rate was between 6% and 26.9%, with a significantly greater burden in the rural population, and a higher proportion of elderly subjects (Guleria et al., 2017; Bright et al., 2019). The deaf and hard of hearing (DHL) prevalence in Indian studies ranged from 4.5% to 18.3%, and the prevalence was 25% to 50% among those aged above 60 years (Roth et al., 2011).

Early-life hearing loss or deafness has more impact on a child's ability to communicate, critical thinking, and social and emotional function (Basilier, 1964, 1973; Fellingner et al., 2005a; Hintermair, 2006; Smith & Gooi, 2014); around 1 to 2 out of every 1,000 newborns and 2 out of every 1,000 young children have hearing loss (Chadha et al., 2009; Nance, 2003; Smith, Bale, & White, 2005; Smith & Gooi, 2014), and dealing with hearing difficulties that increase their risk of mental disorders (Carvill, 2001; Cooper, 1976; Hindley, 1997; Kitson & Fry, 1990).

It was expected that a large number of undiagnosed or unidentified hearing loss presented in the population, only a few evidence-based studies are currently accessible, and a crucial need for clinically sound and genuine research on deafness and how it affects physical and mental health (Connolly, Rose, & Austen, 2006) for suggesting appropriate treatment.

The disabilities due to hearing loss contributed to the loss of personal potential and a financial strain not only for an individual but much more for the family, society & the country. The availability of screening programmes for newborns, the high prevalence of chronic ear infections in the young and the lack of resources or treatment facilities for the elderly are much more common with high prevalence in low-income group countries and worse in urban slums and rural areas where the least access to tertiary healthcare have the highest prevalence of hearing disability. Ignorance regarding the problems, lack of access to facilities and financial constraints caused delayed or no treatment, and prevention of Hearing loss. Robust programmes addressing the populations at risk of Hearing loss and a streamlined implementation with accountability are much needed to avoid a crisis (Verma et al., 2021).

Hearing Disability

World Health Organization (2021) mentioned that a person who is not able to hear or has normal hearing thresholds of 20 dB or better in both ears is a hearing loss. It could be a different level of hearing disability such as - mild, moderate, severe, or profound, and can affect one ear or both ears, resulting in difficulty in hearing conversational speech or loud sounds.

Right of Persons with Disabilities, 2016 defines two terms i.e. Deaf and Hard of Hearing. (a) "Deaf" means persons having 70 DB hearing loss in speech frequencies in both ears; (b) "Hard of hearing" means a person having 60 DB to 70 DB hearing loss in speech frequencies in both ears. A minimum of 40% hearing disability is required to be considered as a minimum criterion for availing benefits from the government of India.

'Disabling' or *'Hearing loss'*; is another issue with hearing loss that refers to any person whose hearing loss is greater than 35 decibels (dB) in a better hearing ear (WHO, 2023) and further reports that about 80% of people with disabling hearing loss living are from low- and middle-income countries, seems its prevalence increases with age, especially among older than 60 years as more than 25% are affected by disabling hearing loss.

"Hard-of-hearing" and *"late-deafened"* are used to describe the deafness that occurs after the development of spoken language, slowly occurring with ageing, the result of prolonged noise exposure resulting in loss of functional hearing ability.

'Disabling Hearing Loss' (DHL) refers to bilateral moderate Hearing Loss (HL) or worse. The audiological criteria are HL in the better ear of >40 dB for adults and >30 dB for children (WHO, 2018).

'Hearing impaired' is used to describe people with any degree of hearing loss including those who are deaf, hard of hearing, and from mild to profound (www.washington.edu/doi).

People living with hearing loss is also been used to refer exclusively to persons with long-term hearing impairments and not to harm their feelings and the rights of the person, especially human activists who have a preference for this term.

The 75th National Sample Survey (NSSO, 2018) report defined *'Hearing Disability'* as difficulty in hearing day-to-day conversational speech but excluded unilateral hearing impairment.

"Decibel" and "Hertz" meaning

The ears receive sound waves, change them into signals, and send them to the brain; then analyze the signals, recognize them as sounds and interpret them as speech, music, or noise.

The volume or loudness of a sound is measured in decibels (dB) and was invented by Alexander Graham Bell. The highness or the pitch of a sound is measured in hertz (Hz), named after the German physicist Heinrich Rudolf Hertz;

how many vibrations in per second e.g. 20 hertz means 20 vibrations per second. A person with normal hearing should be able to hear volumes as low as -10dB to 15dB and frequencies of 250 through 8000 Hz in the audiometric testing.

The following list shows examples of the volume of familiar noises. Most people perceive a 10-decibel increase in volume to be “twice as loud.”

The Severity of Hearing Loss

WHO-proposed grades of hearing impairment and presumed functional consequences (Stevens et al. (2013).

Grade & corresponding audiometric ISO Performance in Quiet and Noise value

0-No impairment, better than 20 dB	No or very slight hearing problems.
1-Mild 20–34 dB	No problems in quiet but may have real difficulty following conversation in noise.
2-Moderate 35–49 dB	May have difficulty in quiet hearing a normal voice and has difficulty with conversation in noise
3-Moderately severe 50–64 dB	Needs loud speech to hear in quiet and has the great difficulty in noise.
4-Severe, 65–79 dB	In quiet, one can hear loud speech directly in one’s ear, and, in noise, has very great difficulty.
5-Profound impairment, 80–94 dB	Unable to hear and understand even a shouted voice whether in quiet or noise.

Hearing loss measured in decibels (dB) indicates functional hearing disability but does not always precisely provide information about either the person’s subjective experience of reduced ability to hear or their preferred language or cultural and social identity (Grønlie, 2005; Hindley, 1997; Israelite et al., 2002;

Maxwell-McCaw & Zea, 2010). There is an instant when measured hearing thresholds are the same for patients but the ability to comprehend & understand verbal communication remains different for every hearing-disabled person.

The reasons for hearing loss differ for each individual based on the underlying causes in their respective regions of parts of the ear. Likewise, psychological effects will vary accordingly.

Among children diagnosed with congenital or childhood (≤ 8 years) hearing loss, moderate hearing loss has been reported in 34-50% of cases, severe hearing loss in 17-34% of 18 cases, and profound hearing loss in 20-30% of cases, depending on definitions and samples (Holzinger, Weishaupt, Fellingner, Beitel, & Fellingner, 2016; Wake, Poulakis, Hughes, Carey-Sargeant, & Rickards, 2005). The degree of hearing loss has not been found to predict the quality of life or psychosocial outcome (Dammeyer, 2010; Fellingner et al., 2008).

Signs of hearing loss

Some of the common signs of hearing loss are (www.nia.nih.gov):

- 1) Have trouble understanding what people are saying over the telephone
- 2) Find it hard to follow conversations when two or more people are talking
- 3) Often ask people to repeat what they are saying
- 4) Need to turn up the TV volume so loud that others complain
- 5) Have a problem understanding speech because of background noise
- 6) Think that others seem to mumble
- 7) Can't understand what's being said when children and people with higher-pitched voices speak to you.

Types of hearing loss

Hearing loss comes in many forms, ranging from mild loss to total loss of hearing, and may broadly categorize as follow (www.nia.nih.gov):

(1) **Sudden hearing loss:** ‘Sudden hearing loss’ also known as ‘sudden sensorineural hearing loss’ is a rapid loss of hearing that happen to any person at all time and at once or short period span.

(2) **Age-related hearing loss:** ‘Age-related hearing loss’ is also called ‘Presbycusis’ and gradually appears as a person grows older.

(3) **Tinnitus:** Tinnitus is described as ringing in the ears like roaring, clicking, hissing, or buzzing in one or both ears, and loud or soft, and a symptom of something wrong in the auditory system, and causes include - earwax blocking the ear canal, Noise-induced, sinus infections, heart or blood vessels problem, Ménière’s disease, brain tumor, hormonal changes in women, thyroid abnormalities as a sign of hearing loss.

Hearing Loss can also be categorized into three types (www.hopkinsmedicine.org):

- 1) Conductive Hearing Loss (Problems lie in the outer & middle ear)
- 2) Sensorineural Hearing Loss (Problems lie in the inner ear)
- 3) Mixed Hearing Loss (combination of outer, middle & inner ears)

Risk Factors of Hearing Loss

There can be many reasons causing hearing Loss, some of the common risk factors are:

- 1) **Ageing.** Deterioration of hearing can occur over time with an increase in age.
- 2) **Loud noise.** Loud sounds may be short or long-term exposure that may damage the function of the ear.
- 3) **Heredity.** Genetic makeup may cause more susceptibility to ear damage from sound or deterioration from ageing.

- 4) **Occupational noises.** Loud noise from the working environment such as construction or factory work can damage the ear.
- 5) **Recreational noises.** Explosive noises like firearms, snowmobiling, motorcycling and loud music can damage hearing.
- 6) **Medications.** Drugs like antibiotics, gentamicin, sildenafil (Viagra) and certain drugs, can damage the inner ear if taken at a very high dose or allergic to that medicine.
- 7) **Some illnesses.** Diseases or illnesses such as meningitis may damage the cochlea.
- 8) **Genetic:** Inherited forms of hearing loss may be evident at birth or can show up in later life like otosclerosis.

Causes of Hearing loss and deafness:

Deaf and hard of hearing loss (DHH) are not the same and can be distinguished by several factors on the cause of the hearing loss, severity, age of onset, and cultural identity (Austen & Coleman, 2004; Israelite et al., 2002). Mostly, “Deaf” people have profound hearing loss, very little or no hearing at all, often use sign language to communicate, and may benefit from Cochlear Implants (World Health Organization, Fact sheet No 300, 2015).

Deafness and hearing loss may be caused by heredity and environmental factors. Nonhereditary includes damaged cochlea caused by intrauterine infection (cytomegalovirus, herpes simplex virus, toxoplasmosis, rubella and syphilis), medication or exposure to toxins.

Hereditary (genetic) causes are congenital, progressive from birth or develop in childhood such as autosomal recessive (80%), autosomal dominant (15%), X-linked (2- 3%) or mitochondrial, Connexin deafness and recessive mutations (Carlsson et al., 2012; Nance, Lim, & Dodson, 2006).

Hyperbilirubinemia (due to Rhesus or ABO blood group incompatibility), preterm, childhood bacterial meningitis, ototoxic medicines (antibiotics, chemotherapeutic agents), noise exposure, trauma, tumours, dysfunction of the central auditory nervous system, central auditory processing disorder, and auditory neuropathy/auditory neuropathy spectrum disorder (Smith & Gooi, 2014).

Some of the mentioned etiologies of hearing loss specifically intrauterine infections and bacterial meningitis a heightened risk for developing additional mental disorders, and prenatal exposure to rubella (Brown, Cohen, Greenwald & Susser, 2000) are also associated with non-affective psychosis in adulthood; childhood meningitis is one of the factors which increase the risk of psychosis in adulthood (Gattaz et al., 2004a, 2004b); children with meningitis are at greater risk for impairment in intellectual, academic and executive ability (Anderson et al., 2004).

Studied evince of the long-term suffering from pneumococcal meningitis in childhood reduced cognitive function, and quality of life (Christie et al., 2017). The aetiology of deafness is often unknown as such many DHHs not knowing the cause of their hearing loss (Black & Glickman, 2006; de Bruin & de Graaf, 2004/2005; Haskins, 2004; Picard, 2004; Vartiainen, Kempainen, & Karjalainen, 1997).

Hearing Disability and Communication Problems

The majority of people who are deaf from birth or at a young age, some are severely hard of hearing, use sign language, and some utilize mechanical or sign-supported speech (Austen & Coleman, 2004). Deaf and hard of hearing (DHH) uses hands and faces that are visually perceived, deciphered, and clearly understood (Klima & Bellugi, 1979; Stokoe, 1960). Sign languages carry linguistic characteristics of spoken languages though but have specific characteristics (Emmorey & Lane, 2013; Klima & Bellugi, 1979; Stokoe, 1960). People who were with congenital, early acquired deafness and hearing loss have been struggling with written texts on fundamental differences between signed and written language in

modality and syntax (Hendar & O'Neill, 2016; Marschark et al., 2011; Steinberg, Lipton, Eckhardt, Goldstein, & Sullivan, 1998).

The majority of DHH people who use sign language prefer spoken language, written communication, or an interpreter, especially when engaging with those who don't use sign language as they rely on residual hearing, speech-reading skills, and conventional hearing aids or CIs (Austen & Coleman, 2004; Barnett, 2002; Middleton et al., 2010). DHH individuals who use sign language and use spoken language have differences in social identity, life circumstances, perceived stressors, and experiences, (Andersson & Lawenius, 1997; Israelite et al., 2002). It is crucial a good communication and language skills while they are young, and good communication with their parents and other primary caregivers (Brown & Cornes, 2015; Dammeyer, 2010) that difficulty in communication results in a risk factor for mental health problems (Brown & Cornes, 2015; Wallis, Musselman, & MacKay, 2004).

Due to communication/language barriers with their parents, many DHHs go through traumatic events such as being taken to residential schools at the age of seven (Fundudis, Kolvin, & Garside, 1979; Grnlie, 2005), and feel very traumatised (e.g., Kvam, 2004; Kvam & Loeb, 2010); that ameliorated distress resulting from the separation from parents and siblings (Breivik, 2007; Ladd, 2003).

DHH individuals from minority cultures meet other students at school and often experience psychosocial issues with mental discomfort such as attachment problems (Jambor & Elliott, 2005; Newman, Lohman, & Newman, 2007) that communicating with the majority of people who don't understand sign language very difficult (Fellinger et al., 2005a) and also being classed as marginal in society and being disabled (Widell, 1993). The signing population are regarded as a linguistic and cultural minority (Breivik, 2007; Ladd, 2003; Widell, 1993), identified as deaf culture (Maxwell-McCaw & Zea, 2011; Meadow-Orlans & Erting, 2000), and separation from other signers leads to social isolation and mental suffering while they want to interact and mix with other (Breivik, 2007; Ladd, 2003), especially in metropolitan areas without schools or other institutions or organizations (Basilier,

1964/1973); new communication technologies such as the Internet, telecommunication and videophone and other media reduce the consequences of geographic isolation (Power & Power, 2009) faced by the DHH person.

The DHH people who use spoken language neither their parents nor their teachers can recognize their need for using the same language but not in schools or other institutions (Dalton, 2011; Herheim, 2015), frequently experience bullying and mockery from peers outside (Fellinger, Holzinger, Beitel, Laucht, & Goldberg, 2009; Herheim, 2015) not their parents aware of their child's social isolation and physical complaints (Fellinger et al., 2008), and high expectation to perform spoken language (Wake et al., 2004) that may deteriorate their mental well-being due to not being able to meet the social expectation.

Communication difficulties make people more susceptible to both internal (emotional states, thoughts, assumptions) and external (visual and auditory) distractions that obstruct communication messages leading to the misunderstanding that has an impact on their physiological and psychological stress levels and increased muscle tension, headaches, and fatigue (Eriksen & Ursin, 2004; Fellinger, Holzinger, Gerich, & Goldberg, 2007; Israelite et al., 2002).

It is very difficult for Hearing loss to identify as deaf or hard of hearing due to fear of stigmatization and social isolation (Dalton, 2011) causing more restrictions and leading to less satisfaction than signing deaf people (Fellinger et al., 2007).

Psychological Impact of hearing disability.

Hearing loss has a profound impact on physical and psychological functions but the present study will look at the selected psychological function as per the objectives of the study, the selected psychological functions are:

- 1) Somatization
- 2) Obsessive-compulsive

- 3) Interpersonal sensibility
- 4) Depression
- 5) Anxiety
- 6) Anger-hostility
- 7) Phobic-anxiety
- 8) Paranoid ideation
- 9) Psychoticism

Somatization: Somatization is a bodily experience and communicates psychological distress as organic symptoms, and an inclination to seek medical help (Lipowski, 1988) which is commonly expressed with physical symptoms of a psychiatric condition like anxiety. The term was introduced by Wilhelm Stekel (Stekel, 1922; Woolfolk & Allen, 2007); the psychodynamic theory conceptualized as an ego defence, a hypothetical process whereby a deep-seated conflict causing bodily disorder, the unconscious repressed emotions convert into somatic symptoms as a form of symbolic communication (Sutker & Adams, 2001), its spectrum can be identified include at one extreme somatization disorder.

Somatic symptom disorder arises when a person has significant physical symptoms like pain, weakness or shortness of breath resulting in major distress or problems functioning and accompanied by excessive thoughts, feelings and behaviours symptoms. The physical symptoms may or may not be associated with a medical condition but believe that they are sick (not faking the illness). A person with somatization is not solely a somatic symptom disorder because a medical cause for physical symptoms is difficult to identify, and accompanied thoughts, feelings and behaviours are excessive and out of proportion.

Somatization is one or more physical symptoms that distress or disrupt daily life due to excessive thoughts, feelings or behaviours of at least one of the following: out of proportion with the seriousness of symptoms, high level of anxiety about health, excessive time and energy spent on health concerns, and at least one symptom are constantly present; and usually begins by age 30. Somatization can have comorbidities with Illness anxiety disorder, Conversion disorder, factitious disorder, Body Dysmorphic Disorder, and Pain disorder (APA 2013; www.psychiatry.org).

Research evinced that bodily complaints receive special attention and will be more used somatization as a defense in later life (Woolfolk & Allen, 2007). Research reviews suggested treatment for the somatic disorder is regular, scheduled outpatient visits focusing on the therapeutic alliance, legitimizing the somatic symptoms, and referral to specialists (Gordon-Elliott & Muskin, 2010). Somatization reveals distress arising from bodily perceptions mostly focused on cardiovascular, gastrointestinal, respiratory, and other systems with autonomic mediation and has a high prevalence in disorders with suggested functional etiology (Derogatis & Savitz, 2000).

Obsessive-compulsive Disorder: Obsessive–compulsive disorder (OCD) is a mental and behavioural disorder, intrusive thoughts or an obsession and feeling the need to perform certain routines/compulsions repeatedly to alleviate the distress caused by the obsession, which impairs general function (APA, 2013). It is on thoughts, impulses, and actions that are experienced by an individual as irresistible an ego-alien or unwanted nature, and cognitive attenuation (Derogatis & Savitz, 2000). Obsession is constant unwanted thoughts, mental images, and urges that generate feelings of anxiety, disgust, or discomfort that include fear of contamination, fixation with symmetry, the fear of acting blasphemously, own sexual orientation, and unusual fear of possibly harming others or themselves.

Obsessive-compulsive disorder is a psychiatric condition including distress and repetitive thoughts (obsessions) that often urge one to do action with compulsion

until feeling at ease. Obsessions and compulsions can vary from person to person but the most common are:

- (i) Organization - things being precisely in the right place or symmetrical, and not performing might result in experiencing distress or even thoughts;
- (ii) Contamination- thought that people can spread non-viral illnesses through touch or proximity that urge to wash their hands repeatedly and clean items frequently to avoid spreading the perceived contamination;
- (iii) Intrusive Thoughts pop at random- saying something aloud, violent or harmful thoughts;
- (iv) Ruminations intrusive thoughts stuck in- on a specific topic and feeling unsatisfied or empty after thinking for so long;
- (v) Checking- checking something multiple times until they can feel at ease ([www. stlukeshealth.org](http://www.stlukeshealth.org)).

Common examples of compulsions are excessive hand washing, cleaning, counting, ordering, avoiding triggers, hoarding, neutralizing, seeking assurance, praying, and checking things at least one hour per day and impairing one's quality of life. The cause of OCD is not known, could be genetic components, and environmental factors that can be a history of child abuse, stress-inducing events, and drug/ medical causes (APA, 2013). Its symptoms are related to generalized anxiety disorder, major depressive disorder, eating disorders, tic disorders, and obsessive-compulsive personality disorder; common treatments used for OCD are psychotherapy such as cognitive behavioural therapy (CBT), pharmacotherapy such as antidepressants, or surgical procedures such as deep brain stimulation (Grant, 2014; Pittenger & Bloch, 2014).

Obsessive-compulsive disorder may affect about 2.3% of people at some point in their lives (Goodman et al., 2014), may begin to appear the symptom after age 35, and around 50% of patients experience detrimental effects to daily life before age 20; males and females are equally affected (APA, 2013).

Interpersonal sensibility: It is feelings of personal inadequacy and inferiority in comparison with others, self-deprecation, uneasiness, and discomfort during interpersonal interactions (Derogatis & Savitz, 2000), and excessive awareness of both the behaviour and feelings of others (Masillo et al., 2012). Interpersonal sensitivity (emotional and social) is the ability to accurately assess others' abilities, states, and traits from nonverbal cues (Carney & Harrigan, 2003), an excessive and expanded awareness of the behaviour and emotions of others.

Individuals having high interpersonal sensitivity are usually sensitive to interpersonal relationships, self-deficiencies, low self-esteem and feelings of insecurity (Mushtaq et al., 2017). Interpersonal sensitivity is associated with psychological distress, poor interpersonal relationships affecting mood, difficulty in initiating relationships, difficulty maintaining relationships, difficulty expressing one's feelings within relationships, difficulties communicating one's needs, and lack of social support/social withdrawal (www.citcassociates.com).

An interpersonal problem is poor quality interpersonal relationships that can predict individuals' depressive symptoms (Huprich et al., 2016). The need theory states humans have an intrinsic need for social connection, unmet needs may affect the individual's behaviour and cognition, and physical and mental health can be damaged (Baumeister et al., 2007). Impaired interpersonal relationships are a manifestation of the unmet need for social connections (Chen et al., 2020). Interpersonal sensitivity is integral to human well-being (Hames et al., 2013) which needs to be managed for better interpersonal relationships in daily life.

The symptom of interpersonal sensitivity is paying too much attention to own relationships with others due to fear of the rejection or criticism of others in social interactions; being extremely sensitive to the feelings of others and any feelings of discomfort during interpersonal interactions, negative self-cognition due to their feelings of personal inferiority in comparison to other persons (Otani et al., 2018). Interpersonal sensitivity represents a set of symptoms that may lead to the development of depression (Derogatis et al., 1976). Being sensitive to others' perceptions, due to fear of rejection and criticism may lead to modifying own

behaviour for less rejection and criticism (Boyce & Parker, 1989). Research indicated that interpersonal sensitivity can predict depression (Chahar et al., 2020) and that interpersonal stress in social interactions serves as the most significant predictor of depression (Vrshek-Schallhorn et al., 2015).

Depression: Hearing loss seems negatively affect communication between family members, health professionals and others, which may lead to social isolation and subsequent symptoms of depression (Linssen et al., 2013). A person above 50 years with hearing loss, not rehabilitated reports higher depression, anxiety, anger, frustration, emotional instability and paranoia, and is less likely to participate in organized social activities than those that were rehabilitated and individuals aged between 61 to 75years develop higher anxiety than normal hearing of the same age suggesting that hearing loss with age can increase and developing depressive symptoms and anxiety (Bernabei et al., 2011). It is a dysphoric mood and effects, withdrawal of life interest, lack of motivation, loss of vital energy, feelings of hopelessness, thoughts of suicide, and cognitive and somatic correlates of depression (Derogatis & Savitz, 2000).

Depression is a negative affective state, ranging from unhappiness, and discontent to an extreme feeling of sadness, pessimism, and despondency that interferes with daily life, changes in various physical, cognitive, and change in social life and withdrawal from social activities, altered eating or sleeping habits, lack of energy or motivation, difficulty concentrating and making decisions as being symptomatic of mental health disorders. Depression may categorize - as major depressive disorder, chronic depression, severe depression, classic depression, and unipolar depression. Depressive symptoms correlated with poorer functioning (Goldney et al., 2004; Backenstrass et al., 2005).

There are several factors for depression:

- (i) Biochemistry- differences in chemicals in the brain may contribute to symptoms of depression;
- (ii) Genetics- eg. Depression run in the family and may be associated with others having the illness sometime in life among the family members;

- (iii) Personality - low self-esteem who are easily overwhelmed by stress, who are generally pessimistic are more likely to experience depression; and
- (iv) Environmental factors – people exposed to violence, neglect, abuse, and poverty are more vulnerable to depression (www.psychiatry.org).

Anxiety: Anxiety is an emotion characterized by an unpleasant state of inner turmoil which includes feelings of dread over anticipated events (Davison, 2008; Miceli & Castelfranchi, 2014), an anticipation of a future threat (Crocq, 2015), accompanied by nervous behaviour such as pacing back and forth, somatic complaints, and rumination (Seligman et al., 2001), a feeling of uneasiness, worry, overreacting to a situation (Bouras & Holt, 2007), accompanied by muscular tension (APA, 2013), restlessness, fatigue, inability to catch one's breath, tightness in the abdominal region, nausea, and problems in concentration, withdraw from situations which have provoked anxiety in the past (Barker, 2003).

Anxiety disorder is with specific clinical definitions (Evans et al., 2005), persists 6 months or more, and is one of the most persistent mental problems and often last decades (Hovenkamp-Hermelink et al., 2021).

Anxiety may cause behavioural effects including withdrawal from situations, changes in sleeping patterns, changes in habits, increase or decrease in food intake, increase in motor tension (Barker, 2003), trouble concentrating, feeling tense or jumpy, anticipating the worst, irritability, restlessness, mind's gone blank' (Smith, 2008), "nightmares/bad dreams, obsessions about sensations, scary, vague experience and feeling of helplessness (Milfayetty et al., 2020), fear of dying (Folk, 2021), and the most frequent of all abnormal distressing effects (Kraepelin, 1909). Paul Tillich describes anxiety as the state in which a being is aware of its possible nonbeing and suggests three categories: ontic- fate and death, moral -guilt and condemnation, and spiritual- emptiness and meaninglessness (Tillich, 1952)

Anxiety may cause also physiological symptoms may including headache, paresthesias, fasciculation, vertigo, abdominal pain, nausea, diarrhoea, indigestion, dry mouth, shortness of breath or sighing breathing, palpitations, tachycardia, chest pain, fatigue, tremors, perspiration, or itchy skin, frequent urination, urinary urgency,

dyspareunia, impotence, chronic pelvic pain syndrome (WHO, 2009; Testa et al., 2013).

Freud creates many terms for various anxiety disorders such as panic disorder, GAD, and PTSD used in DSM-I and DSM-II. DSM-III (APA, 1952, 1968, 2000) and groups together in DSM 5 (APA, 2013):

- (i) a grouping of anxiety disorders into three spectra (anxiety, OCD, and trauma- and stressor-related disorders) based on the sharing of common features, and
- (ii) the grouping of developmentally connected disorders; the prevalence of anxiety disorders in women is approximately twice as high as in men disorders and is associated with an enormous economic burden for society (Marc-Antoine, 2015).

Anxiety disorders are considered the most prevalent psychiatric disorders; one-third of the population is affected by an anxiety disorder during their lifetime, more common in women and has the highest prevalence in middle life, and is an enormous economic burden for society (Bandelow & Michaelis, 2015). Even Robert Burton (Burton, 1962) describes the trouble caused by anxiety at an individual and societal level. The common types of anxiety are; separation anxiety disorder, specific phobia, social phobia, agoraphobia, panic disorder, and generalized anxiety disorder (Beesdo et al., 2009). The female sex consistently emerges as a risk factor about twice as likely as males to develop each of the anxiety disorders (Wittchen et al., 1998) with higher rates of anxiety disorders among lower education, and a degree of urbanization (rural/urban) does not correlate of anxiety disorders (Vega et al., 1998).

Anxiety prevalence was higher in hearing-impaired people in 8/10 studies with a comparator non-hearing disabled group (Shoham et al., 2019), and quality-of-life score was associated with lower anxiety (Bruggemann et al., 2017).

Anger-hostility: Anger-hostility can include mistrust, cynicism, and negative beliefs and attributions concerning others (Smith, 2003). and classified under Type A behaviour along with (high) neuroticism and (low) agreeableness Some studies have

found a close association between hostility and coronary heart disease (CHD) (Chida & Steptoe, 2009) around 19 %, predict a higher likelihood of recurrent myocardial infarction (Chaput et al., 2002) with cardiovascular-related death (Matthews, Gump, Harris, Haney, & Barefoot, 2004), and cancer-related mortality (Tindle et al., 2009).

High hostility relates to lower levels of social support (O'Neil & Emery, 2002), more interpersonal conflict (Siegler et al., 2003), more negative, and fewer positive interpersonal interactions (Brondolo et al., 2003), less recognition of positive responses from others (Kahler et al., 2012). Hostile people are more anxious, and receive lower support (Holt-Lunstad et al., 2008) with a constellation of psychosocial vulnerability (Smith, 2003). Hostility is associated with more smoking, alcohol use, physical inactivity, and poor eating habits (Appleton et al., 2016; Chida & Steptoe, 2009; Siegler et al., 2003).

Hostility appears more in men and is largely explained by behavioural factors such as smoking and physical activity. Hostility has been linked to stress reactivity, exaggerated autonomic function, reduced heart rate variability, inflammation, and platelet aggregation. Mental stress is reported to enhance the risk of cardiovascular disease (Sandrini et al., 2020).

High hostility person is prone to more interpersonal conflict (Siegler et al., 2003), more negative, and fewer positive interpersonal interactions (Brondolo et al., 2003), hostility was greater in men than in women (Fava et al., 1995), and was greater among the subjects belonging to the urban areas than the subject belonging to the rural areas (Bisht & Sharma, 2021). Hostility impairs health (Brydon et al., 2006), employment (Timothy et al., 2006), and quality of life (Shen et al., 2006).

Phobic-anxiety: A phobia is one type of anxiety, an overwhelming fear of an object, place, situation, feeling or animal, more pronounced than fear, an exaggerated or unrealistic sense of danger in a situation or object causing a feeling of unsteadiness, dizziness and lightheadedness, nausea, sweating, increased heart rate, palpitations, shortness of breath, trembling or shaking, and upset stomach (www.nhs.uk).

There is a variety of phobias classified into two main categories:

(i) Specific or simple phobias - phobias centre around a particular object, animal, situation or activity such as animal (dogs, spiders), environmental phobias (heights, deep water and germs), situational phobias (flying, climbing), bodily phobias (blood, having injections), sexual phobias (fear of getting a sexually transmitted infection)

(ii) Complex phobias - develop during adulthood, associated with a deep-rooted fear of a particular situation or circumstance which include agoraphobia (thought of as a fear of open spaces), and social phobia (afraid of speaking in front of people for fear of embarrassment and humiliation)

Paranoid ideation: Paranoia is a thought process that includes persecutory beliefs or beliefs of conspiracy concerning a perceived threat towards oneself, irrational fear, false accusations and the general distrust of other people, and a central theme of psychosis. A paranoid person usually believes an incident is intentional while most people view it as an accident or coincidence (Green et al., 2008).

A common symptom of paranoia is an attribution bias (Bentall & Taylor, 2006), feeling powerless, depressed, isolating oneself, relinquishing activities (Freeman et al., 2005), erotic, persecutory, litigious, and exalted (Deutsch & Fishman, 1963). Hearing disability affects the development and severity of psychosis, the presence of paranoia and persecutory delusions, sensory deprivation (Daniel et al., 2014), social differentiation (Hoffman, 2007), and misinterpretation of communication (Linszen et al., 2016). Cooper et al. (1974) describe a significantly higher level of paranoid psychosis in patients with conductive hearing loss than in patients with affective illness (Cooper et al., 1974).

Research evinced a significant association between paranoid illness and bilateral conductive deafness with earlier age of onset, longer duration and greater (Cooper & Curry, 1976).

There is a positive relation between paranoid ideation and stressful life events or perceived stress (Ohayon, 2000; Cohen et al., 2004; Johns et al., 2004), psychotic symptoms correlate with depression which leads to feelings of hopelessness (van Os et al., 2000; Stefanis et al., 2002; Cohen et al., 2004; Hafner et al., 2005; Krabbendam et al., 2005), psychotic symptoms are associated with impulsivity among the low-income group (Compton & Kaslow, 2005). Studies psychoticism associated with panic attacks (Goodwin et al., 2004) and impulsivity (Compton & Kaslow, 2005).

Psychoticism: Psychoticism is one of the three traits used by Hans Eysenck in his model of personality (Eysenck, 1993), which may be divided into narrower traits such as impulsivity and sensation-seeking. Psychoticism is an unsocialized sensation-seeking (Zuckerman et al., 1991), caused by levels of dopamine (Lester, 1989) monoamine oxidase; beta-hydroxylase, cortisol, norepinephrine in cerebrospinal fluid.

Psychotic symptoms have a continuum from normality to psychotic disorder (van Os et al., 1999), and variation in psychosis phenotype is evident from several studies in the general population (Peters et al., 1999; van Os et al., 1999; Krabbendam et al., 2005), have a lifetime prevalence of 10% in men and 15% in women (Tien, 1991) comorbidity with paranoia at 9.1% and hallucinations at 4.2% (Claridge et al., 1996) in Britain. A study reported a rate of 8.7% for delusions and 6.2% for hallucinations in the Netherlands (van Os et al., 2000).

Theories of Psychopathology

Some important theories explained the causes of pathology differently as follows:

Biomedical Theory: The Medical model of psychopathology is based on the assumption that if the brain, neuroanatomy and related biochemical work together to mediate psychological processes, any malfunctioning resulting in psychopathology

and the causes are believed to be physical/biological bases. This theory stems from research findings on the neurotransmitter eg low serotonin shows major psychological illnesses that lead to bipolar disorder and anorexia nervosa and reduced levels of Serotonin in the brain (Cardwell et al., 2008). The model suggested that psychological illness should be treated like any physical illness (being caused by a chemical imbalance or physical stress, and also can be treated with surgery or drugs as mental pathology is accompanied by physical pathology).

Psychodynamic Theory: Psychodynamic theory was created by Freud and evolved significantly over the years, and many theorists have contributed to it. They believed that human behaviour could be explained by intra-psychic processes, interpersonal patterns, and childhood experiences.

The psychodynamic theory tries to explore a person's deeply rooted drives, needs and desires, and can be understood through four schools of thought:

- (i) Drive theory- behaviour is based on several drives including sex, self-preservation and destruction/aggression (death) drive; any pathological behaviour is a conflict between the drives and the superego or the ego.
- (ii) Ego psychology- a person's environment and reality are important for personality development;
- (iii) Object relations theory - behaviour based on object seeking, and relationships with significant others around them;
- (iv) Self-psychology - a person's perception of himself concerning their social environment for a healthy sense of self and resilient;
- (v) Object relations focused on the unconscious issues of an individual's thoughts, emotions and behaviours (Goldstein, 2001; Mitchell & Black, 1995); a constant interplay ("dynamic") of the unconscious and an imbalance results in emotional disorder.

Behavioural Theory: This theory assumed all maladaptive behaviour is essentially acquired through one's environment and the main solution to psychological illness is

aversion therapy where the stimulus that provokes the dysfunctional behaviour doesn't focus on the cause of the illness or problem; the individual and cultural differences be taken into account to regard the behaviour as a mental disorder; and the environment was solely responsible for all behaviour (Watson, 1913); so, the mental illness and the persistence behaviours can be understood through learning theory.

Cognitive Theory: The cognitive model focuses on cognitive distortions, dysfunctions in the thought processes and cognitive deficiencies in thinking and planning (Dobson & Kendall, 1993); the psychological disorders explain abnormality in irrational and negative thinking which determines all behaviour (Galton, 1883). It emphasizes the evaluation of internal mental processes such as perception, attention, memory, and problem-solving to explain the development of mental disorders; and the link between cognition and brain function especially to develop therapeutic techniques and interventions (Ellis, 1982).

Mental disorder is created by errors of thinking and dysfunctional thinking in response to stimuli. Impaired modular processes are

- 1) Amnesia -deficit in learning new information;
- 2) Aphasia- loss or impairment of language;
- 3) Alexia -dysfunction in the comprehension of written language;
- 4) Agraphia- Disturbances in writing;
- 5) Acaculia - Impairment in numerical computations;
- 6) Apraxia -Disorders of skilled movement that cannot be reduced to more elementary factors, such as motor weakness and impaired comprehension; and
- 7) Agnosia - Failure of recognition that cannot be explained by impaired perception, comprehension, and so on;
- 8) Neglect - Difficulty in reporting (Trivedi, 2006; Stuss et al., 2008).

Social Learning Theory

Social learning lies in diverse fields: social psychology, psychiatry, and experimental psychology (Hollands, 1961; Sullivan, 1965; Thibaut & Kelley, 1959; Skinner, 1957) can be attributed to Bandura (e.g., Bandura, 1969, 1977; Bandura & Walters, 1963) stem from his theoretical work from modelling and aggression studies among normal behaviour. Albert Bandura (1961; 1963) conducted a series of experiments on social behaviours (aggression) by observation and imitation and developed the social learning theory (Bandura, 1977) which postulates that learning takes place in a social framework with the interaction between the people in the social environment. The assumption of Social Learning Theory is

- 1) Learning through observation and acquiring new behaviour and knowledge by merely observing the model;
- 2) Reinforcement and punishment have indirect effects on behaviour and learning from the expectations about the potential consequences of future responses based on current reinforced or punished;
- 3) Meditational processes influence behaviour that contributes to acquiring new behaviour or not. Social learning theory is the most evident behaviour of children, as they imitate family members, other significant persons, and even television characters.

Psychopathology in Hearing Disability:

The DHH population has a higher mental problem than the general community (Carvill, 2001; Cooper, 1976; de Graaf & Bijl, 2002; Fellingner et al., 2012; Hindley, 1997; Kitson & Fry, 1990), many factors can contribute as rightly mentioned in the developmental psychopathology and diathesis-stress model (Monroe & Simons, 1991) that mental disorders result from individual vulnerability and also an environmental risk on the other (Cicchetti & Cohen, 2006; Horowitz, 1987; Sameroff, 2014).

Most mental disorder among adult seems to set at an early age (Kessler, Chiu, Demler, & Walters, 2005) like anxiety disorders, depressive disorders and disorders resulting from psychoactive substance use (Kessler et al., 2005; Kringlen, Torgersen, & Cramer, 2001; Sheehan et al., 1998).

Several studies revealed mental disorder cannot be separated from the social context in which it occurs (Bronfenbrenner, 1977), viewed as part of the dynamic relationship between the individual and his or her context (Sameroff, 2014) that communication and language form the basis for the conceptual and emotional experiences and play a crucial role in preventing mental disorders (Pynoos, Steinberg, & Piacentini, 1999).

The deaf and hard-of-hearing populations speak the language of the culture to which they belong and rely on their residual hearing, hearing aids, or cochlear implants, and their vision for lip-reading (Barnett, 2002; Middleton et al., 2010) while congenitally deaf and severely hard-of-hearing use the national sign language. People with combined sensory loss (deaf-blindness) also communicate with tactile sign language (Austen & Coleman, 2004), and most congenitally deaf adults today received education in special schools for deaf and hard-of-hearing children.

Problems with language and communicative ability are linked to the development of psychopathology in DHH people (Basilier, 1964, 1973; Black & Glickman, 2006; Connolly et al., 2006; de Graaf & Bijl, 2002; Hindley, 1997).

A disabling hearing loss may have negative effects on language and communication and makes it more difficult to perceive and interpret actions and situations correctly (Greenberg & Kusché, 1998), such as the actions of a potential perpetrator (Schild & Dalenberg, 2012).

Hearing loss is restricted access to information and limits opportunities for sharing adverse experiences and receiving treatment in the language that they use (Anderson & Kobek Pezzarossi, 2012; Johnston-McCabe, Levi-Minzi, van Hasselt, & Vanderbeek, 2011).

Hard of hearing will have difficulty detecting what is happening and reacting adequately in a situation like a natural disaster or motor accident as a normal person could do it properly (Schild & Dalenberg, 2012), that information deprivation trauma denotes traumatization as a result of lack of adequate and sufficient information in deaf individuals.

Development cannot be separated from the social context in which it occurs (Bronfenbrenner, 1977) and the development of mental disorders may be viewed as part of the dynamic relationship between the individual and his or her context (Sameroff, 2014). With this in mind, a deaf or hard-of-hearing child whose family members are all hearing may be at risk as communication and language form the basis for the conceptualization and emotional processing of such experiences and events that play a crucial role in preventing mental disorders (Pynoos, Steinberg, & Piacentini, 1999).

The quality of parent-child communication may have far-reaching consequences for parent-child emotional bonding and the child's emotional, cognitive, and social development. Problems with language and communicative ability have been linked to the development of psychopathology in DHH people (Basilier, 1964, 1973), and studies of clinical DHH samples report a high proportion of signers (Black & Glickman, 2006).

Psychological Wellbeing (PWB): Psychological well-being is far behind the knowledge of psychological dysfunction/ disorder. If a person not having anxiety, depression, or other forms of psychological symptomatology are usually understood as mentally sound.

No clear definition of psychological well-being, despite the forgotten or untouched psychological well-being, much has been written within and outside, the field of psychology. Much attention has been paid to the concept of Psychological well-being which is widely researched in adolescent studies.

Researchers framed a combination of indicators including self-esteem, life satisfaction and affect status to indicate adolescents' psychological well-being (Armsden & Greenberg, 1987), hopelessness, purpose in life and general psychiatric morbidity (Shek, 1997), hope (Ryzin et al., 2009), anxiety, and depression (Wong et al., 2009). It seems psychological well-being has been used as an umbrella term than a theoretical construct of psychological well-being.

Well-being can be used in different fields with different meanings (McLellan et al., 2012). Psychology defined well-being as an optimal psychological functioning and experience in life (Ryan & Deci, 2001), and have two philosophical stances - hedonism which underscores being happy and eudaimonism which places more emphasis on being meaningful (Deci & Ryan, 2008).

Hedonism proposed that subjective well-being (SWB) refers to an individual's affective and cognitive evaluations of life (Diener, 2000). Eudaimonic theorists give importance to an individual's sense of fulfillment in life (Deci & Ryan, 2008).

Ryff (1989) proposed a theoretical model of psychological well-being based on human function which comprises six different aspects - positive functioning, namely autonomy, environmental mastery, personal growth, purpose in life, positive relations with others and self-acceptance. This model has been adopted in many empirical studies in various contexts (Ryff, 2013), originally developed for adults' positive functioning (Ryff, 1989) seems. Nevertheless, Ryff's theoretical model has been utilized and benefits in adolescents' psychological well-being research.

Ryff's model has been widely used and influential in the field of positive psychology, as it provides a comprehensive and integrative approach to understanding well-being beyond the absence of psychological distress. Accordingly, the present study attempted to validate the SPWB in a sample of hearing loss samples and to investigate their psychological well-being.

Dimension of the Psychological Well-Being (Ryff, 1989) shown below:

Figure-1: Showing the six dimensions of Psychological well-being (Ryff, 1989).



Dimension	Characteristics of a high scorer	Characteristics of a low scorer
Self-Acceptance	Possess a positive attitude toward self; acknowledge and accept multiple aspects of self including both good and bad qualities; and feel positive about past life.	Feels dissatisfied with self; is disappointed with what has occurred in a past life; and wishes to be different than what he/she is.
Positive relations with other people	Has warm, satisfying, trusting relationships with others; is concerned about the welfare of others; is capable of strong empathy, affection, and intimacy; and understands the give and take of human relationships.	Has few closes, trusting relationships with others; finds it difficult to be warm, open, and concerned about others; is isolated and frustrated in interpersonal relationships; and is not willing to make compromises to sustain important ties with others.

Autonomy	Is self-determining and independent; can resist social pressures to think and act in certain ways; regulate behaviour from within; and evaluate self by personal standards.	Is concerned about the expectations and evaluations of others; relies on judgments of others to make important decisions; and conforms to social pressures to think and act in certain ways.
Environmental mastery	Has a sense of mastery and competence in managing the environment; controls a complex array of external activities; makes effective use of surrounding opportunities; and can choose or create contexts suitable to personal needs and values.	Has difficulty managing everyday affairs; feels unable to change or improve surrounding contexts; is unaware of surrounding opportunities; and lacks a sense of control over the external world.
Purpose in life	Has a goal in life and a sense of directedness; feels there is meaning to present and past life; holds beliefs that give life purpose; and has aims and objectives for living.	Lacks a sense of meaning in life; has few goals or aims, lacks a sense of direction; does not see the purpose of past life; and has no outlook or beliefs that give life meaning.
Personal Growth	Has a feeling of continued development; sees self as growing and expanding; is open to new experiences; has the sense of realizing potential; sees improvement in self and behaviour over time	Has a sense of personal stagnation; lacks the sense of improvement or expansion over time; feels bored and uninterested in life; and feels unable to develop new attitudes or behaviours.

Psychological well-being has a negative relation with degrading and unrewarding work environments, unfulfilling obligations and unsatisfying relationships. Social interaction is strongly related to well-being (Rook, 1984) traumatic experiences and perceived stigma diminish psychological well-being and psychological resilience (Nurius et al., 2015) especially stigma relate to obesity and physical ailments or disabilities (Jackson et al., 2015).

Meta-analytic research shows that neuroticism is the predictor of psychological well-being, openness relate to personal growth, agreeableness and extraversion related to positive relations, and conscientiousness related to environmental mastery and purpose in life (Anglim et al., 2020).

Eudaimonia is identified with self-control, and heritable as the four subsidiary biological mechanisms enabling the psychological capabilities of purpose, agency, growth, and positive social relations (Archontaki et al., 2012).

Wellness has been used in developmental psychology, especially life-span developmental psychology as progressions of ongoing growth over the length of a person's life in Neugarten's descriptions of personality change in ageing, Erikson's stages of psychosocial development, Buhler's formulation of fulfillment of life, and Buhler's formulation of basic life tendencies, Maslow's conception of self-actualization, Rogers's fully-functioning individual, Jung's formulation of individuation, and Allport's conception of maturity.

These perspectives have had little impact on empirical research on psychological well-being due to the lack of operational definitions, measures and diversity of these characterizations of Wellness.

Subjective Well-being (SWB):

Subjective well-being (SWB) is an individual's aspects of positive judgment, pleasant emotions and moods, and the absence of unpleasant emotions with negative moods (Diener 1984 b; Diener & Lucas. 1985). Life satisfaction is a cognitive

judgment on own quality of life (Diener et al. 1999). On the other side, Subjective Well-being (SWB) is an affective component that promotes happiness by enhancing good effects and decreasing negative affect (Lyubomirsky et al. 2005; Lyubomirsky et al. 2005).

Social Well-being Theory

Keyes (1998) did not accept the concept of SWB and its focus on the psychological aspect of well-being. He proposed social well-being as "the appraisal of one's circumstance and functioning in society." He mentioned that individual is a part of social institutions and groups, and deal with a variety of social tasks and issues, such as:

- a) *Social integration*: quality of one's relationship to the society and community;
- b) *Social acceptance*: the construal of society through the character of an individual and categorization as trustworthy, capable of kindness etc;
- c) *Social contribution*: one's social value as one member of society with something to give to the world;
- d) *Social Actualization*: the potential and the Trajectory of Society;
- e) *Social Coherence*: the perception of the social world. Social Well-being theory focuses on the individual's capacity for adaptation and integration into society.

In the early 19th century, Economics raise interest in the study of the economics of well-being. The economics of well-being focuses on the aspect of society or individual behaviour that is closely linked to obtaining and making use of the material necessities of well-being. Economic welfare is a measurable aspect of social welfare expressed in monetary terms; improves living conditions resulting in higher growth rates of financial and higher rates of life satisfaction (Easterlin et al., 2010).

The Well being new model include health, energy, creativity, fulfillment, and resilience to describe the thriving and flourishing of the mind, body, society, and

environment as a whole, not only concentrating on cognitive and emotive processes but harmonious interaction. The Indian approach to well-being refers to Maitri, Karuna, Mudita and Upeksha which can be explained as relatedness, compassion, pleasant disposition and avoidance of conflict and negating the ego. Well-being is a mixture of survival, well-being, freedom and identity.

Psychological well-being refers to an experience of positive emotions and feelings of happiness. PWB may also refer to subjective well-being (Diener, 2000). Subjective well-being is a necessary part of overall PWB but on its own, it is not enough.

The term “Hedonic” well-being is normally meaning the subjective feelings of happiness and the less well-known term is “Eudaimonic”. Well-being is used to refer to the purposeful aspect of PWB.

The psychologist Carol Ryff has developed a very clear model that breaks down Eudemonic well-being into six key parts (Ryff et al., 2004). The psychological Well-Being Scale (Ryff, 1989), includes six dimensions Self-Acceptance, Positive Relationships, Autonomy, Environmental Mastery, Purpose in Life and Personal Growth.

The Six-factor Model of Psychological Well-being theory developed by Carol Ryff includes six factors which contribute to an individual's psychological well-being or happiness (Seifert, 2005) and can be attained by achieving a balance of challenging and rewarding life events (Dodge et al., 2012). It consists of self-acceptance, positive relationships with others, autonomy, environmental mastery, a feeling of purpose and meaning in life, and personal growth and development (Ryff, 1989).

Psychological well-being is attained by achieving a state of balance affected by both challenging and rewarding life events (Dodge et al., 2012).

Autonomy indicates the independent behaviour of a person under social pressure (Seifert, 2005). Environmental Mastery refers to the effective use of opportunities and a sense of mastery in managing environmental factors, managing

everyday affairs and benefit to personal needs (Seifert, 2005). Personal Growth: Individual developing with new experiences, and recognizes improvement in behaviour over time (Seifert, 2005). Positive Relations with Others: Engaging in meaningful relationships with others that include reciprocal empathy, intimacy, and affection (Seifert, 2005). Purpose in Life: Strong goal orientation and conviction holding life meaning (Seifert, 2005). Self-Acceptance: Positive attitude toward own self (Seifert, 2005).

Positive psychological well-being may emerge from numerous sources including a satisfying job, meaningful relationship with others (Diener, 1994), positive behaviour (forgiveness, optimistic expectations, positive thoughts about one's spouse, kindness) that improves psychological well-being (McNulty & Fincham, 2012).

A propensity to optimism especially important when an individual receives threatening negative feedback, to protect psychological well-being and self-confidence (Taylor & Brown, 1988), helps to cope with stresses to their well-being

Sub-areas of Psychological well-being:

Self-acceptance- High in self-acceptance possesses a positive attitude toward the self; acknowledges and accepts multiple aspects of self, including good and bad qualities; feels positive about past life. Low in self-acceptance feels dissatisfied with self; is disappointed with what has occurred in a past life; is troubled about certain personal qualities; wishes to be different from what he or she is.

Hearing loss children usually show lower self-esteem than hearing peers based due to the physical appearance of wearing devices and physical differences with the syndrome, and communication difficulties (Bat-Chava, 1993; Bat-Chava & Deignan, 2001; Huber, 2005; Tambs, 2004; Weisel & Kamara, 2005); early identified of hearing loss are better self-esteem than later identified of hearing loss (Leigh, Maxwell-McCaw, Bat-Chava, & Christiansen, 2009).

Children with hearing loss have speech, language, and perceptual skills almost like their hearing peers have a higher positive self-esteem than poorer than

their peers in children, adolescents, and adults (Blood, Boyle, Blood, & Nalesnik, 2010; Boyle, 2013; Huber, 2005). Good communication skills promote higher social competence and increased self-esteem (Leigh et al., 2009) through successful communication for active participation in social environments, and help social relationships outside of the home that strengthens self-esteem (Leigh, 1999; Stinson & Kluwin, 2003).

Positive relations with others- High in Positive relations likely have warm, satisfying, trusting relationships with others; more concerned about the welfare of others; have strong empathy, affection, and intimacy; and have a good understanding of the give and take of human relationships.

Low in positive relations with others use to have a few close and trusting relationships with others; finds difficulty to be warm, open, and concerned about others; isolated and frustrated in interpersonal relationships; not willing to make compromises to ties with others. Research evinced that person with acquired hearing loss is high in psychological distress due to isolation, loneliness, withdrawal (Meadow-Orlans, 1985), manifested high anxiety, depression, and sleeping disturbance (Hallberg & Barrenas, 1995; Hetu, Riverin, Getty, Lalande, & St-Cyr, 1990) that significantly impact to the family or significant others (Schein, Bottum, Lawler, Madory & Wantuch, 2001).

Psychological distress resulting in adjustment difficulties, communication stress, social isolation, and unsupportive supervisors are constantly encountered by many deaf and hard-of-hearing workers (Schroedel & Geyer, 2000).

Autonomy- high autonomy is characterized by self-determining and independence; the ability to resist social pressures including thinking and acting in certain ways; the ability to regulate own behaviour from within; and the ability to evaluate self by personal standards.

Low Autonomy is worried about the expectations and evaluations of others; relying on the judgments of others in making important decisions; conforms to social pressures in their way of thinking and acting. Hearing loss limits their communication due to evidence of negative consequences in their daily life (Olusanya et al., 2014) resulting in higher unemployment rates than the rest of the population. That limitation in hearing and understanding speech leads to fatigue and the need for more recovery time (Kramer et al., 2006; Nachtegaal et al., 2009), and facing significant physical and social challenges that contribute to their social isolation and loss of autonomy coupled with associated anxiety, depression, cognitive deficits and dementia (Lin et al., 2013)

Environmental mastery- High environmental mastery is a sense of mastery and competence in managing their environment; the ability to control a complex array of external activities; make effective use of their surrounding opportunities; ability to choose or create contexts suitable to personal needs and values.

Low environmental mastery is difficulty in managing everyday affairs; feeling of inability to change or improve their surrounding context; lack of awareness about surrounding opportunities; lack of sense to control their external world. Hearing disability is connected with poorer physical functioning (Reuben et al., 1999; Viljanen et al., 2009), slower gait speed (Li et al., 2012), and evinced among individuals with hearing loss (Loprinzi, 2013).

The purpose in life- High in purpose life is having a goal in life and a sense of directedness; feeling the meaning to present and past life; holding beliefs of life purpose; and having aims and objectives for a living.

Low purpose in life is a lack of sensing the meaning of life, having few goals or aims, lacking a sense of direction, not seeing the purpose of past life, no outlook or beliefs to have life meaning. Several studies demonstrated that Presbycusis harms the quality of life and psychological well-being due to social isolation; depression,

anxiety, and even cognitive decline have been reported in people with hearing loss (Dalton et al., 2003; Gates & Mills, 2005; Heine & Browning, 2002)

Personal growth- high in personal growth is a feeling of continuing development, seeing self as growing and expanding, being open for new experiences; realizing own potential; observing improvement in self and behaviour over time, and changing to reflect more self-knowledge and effectiveness.

Low personal growth is a sense of personal stagnation, lack of sensing about improvement or expansion over time, feeling bored and uninterest in life, and feeling of inability to develop new attitudes or behaviours.

An individual with hearing loss is most likely having trouble with hearing including background noise in the classroom and communication often less than clear that affecting access to education resulting in high need for Social Security Disability Insurance and Supplemental Security Income (SSI) than normal hearing (Clarcq & Walter, 1997-1998).

Research revealed that the worrisome problem of hearing loss was a 44 % high school dropout rate among deaf students (Blanchfield, Feldman, Dunbar, & Gardner, 2001) compared with 19 % in the general population. Many employers have a higher resistance to hiring deaf individuals, and that problem was added that automation of many work functions has disadvantaged the unskilled deaf worker (Buchanan,1999) resulting in lower educational achievement for deaf persons and persist to contributing to vocational difficulties.

Psychopathological symptoms are negatively correlated with psychological well-being in Argentina (Casullo & Castro, 2002), Mexico (Pérez et al, 2010), Australia (Winefield, Gill, Taylor, & Pilkington, 2012) samples, and those who perceive more psychological well-being showed lower symptoms of psychopathology that affects overall development and prevent psychopathological consolidation (Winefield et al., 2012).

A higher level of general psychological well-being is associated with a lower level of distress and psychopathological symptoms in Mexican (Pérez et al., 2010) and Australian (Winefield et al, 2012) college students.

Psychological well-being is related to the high quality of interpersonal relationships that help the development of a sense of self-determination throughout life (Casullo & Castro, 2002).

CHAPTER- II: REVIEW OF LITERATURE

Review of Literature:

Hearing loss is one of the important issues in public health. Globally, as much as, 5% of the world's population has a hearing loss disability (Eide et al., 2016) and it is estimated that about 900 million people, will be hearing loss persons by 2050 (WHO, 2016). As of now, approximately one-third of people over 65 years of age were having hearing loss (Eide et al., 2016). Most of them are from low and middle-income countries, with the identified causes being a lack of access to health services and the use of some drugs having the potential to cause ototoxicity (Cianfrone et al., 2011). Hearing loss is recognized as the third source of long-term disability in the Global Burden of Disease. Among American people, around 2-3% at 12 years or older were affected by moderate unilateral (single-sided) hearing loss and 1 in 7 % had bilateral (double-sided) hearing loss (Goman & Lin, 2016).

Noise-induced, is one of the common causes of hearing loss among the residents of cosmopolitan cities (Kumar et al., 2017) at the age ranges of 21-30 yrs (Kumar et al., 2017; Wang et al., 2020). Hearing Loss is usually accompanied by stigmatizing and heavily expensive assistive technology of hearing aids and cochlear implants (Blazer & Tucci, 2019; Powell et al., 2019). Hearing loss is known to affect mental health, well-being, and social interaction. Negative consequences of hearing loss include impairment in education, family life, and employment hardship in life (Newman & Newman, 2016). The social function theory stated that the diagnosis of hearing loss embarrassed young and middle-aged adults (Blazer & Tucci, 2019), affecting their way of thinking relating to personal growth in the social world (Newman & Newman, 2016). People diagnosed with hearing loss at a young age exhibit more emotional distress and feeling of stigmatization (Baldrige & Kulkarni, 2017).

Early-onset of hearing loss in children can cause hindrance in speech development and language skills (WHO, 2013) and such difficulties, can severely affect emotional and social development, family interconnectedness, social inclusion and impairment in overall perceived quality of life (Adigun, 2017). Additionally, early-onset hearing loss individuals usually experience social isolation, low self-

esteem and depression (Fellinger et al., 2008) which subsequently leads to cognitive and functional impairments (Johannes et al., 2012).

Hearing loss invites, anxiety, stress, fatigue, social alienation, and low social-emotional well-being (Arslan et al., 2018), adverse attitudes and actions that always happened when diagnosed with hearing loss in young adults with DHH (Newman & Newman, 2016). Common negative consequences of hearing loss include financial tension, low social-emotional well-being and intensified feeling to access audiologists (Kochkin, 1993; Powell, Jacobs, Noble et al., 2019).

Hearing disability has an impact on psychological, emotional and social well-being, social interaction (Lucas et al., 2018), mental health (Lawrence et al., 2019), social communication uncomfortable, isolation from social obligations, sense of alienation, and depression (Weinstein & Ventry, 1982). Such impaired communication limits their social interactions, diminishing social roles (Kramer et al., 2002), leading to depression and emotional disturbance (Kramer et al., 2002). This may lead to difficulty in dealing with their everyday life functions, resulting in a decrease in social interactions and psychosocial well-being (Andersson et al., 1996).

Mental Health Problems in Hearing Loss

Hearing loss is known to be related to many Mental Health Problems. However, the scope of the present study is limited to the following Mental Health Problems. The psychological symptom profile, which was evaluated using the Symptom Check List 90-Revised Form (SCL-90-R), revealed a significantly higher level of Somatization, Interpersonal sensitivity, Depression, Phobic anxiety and other psychological variables. Also lower levels of Quality of life (QoL), in terms of physical role difficulty, general health perception, social functioning, and mental health are evident in persons with mild or moderate Hearing Loss (Bakir et al., 2013).

Hearing Loss and Somatization: The degree of hearing loss and outcomes did not differ between adults who lived in rural or urban settings but the income was associated with other types of social support (Hay-McCutcheon et al., 2018). People in rural settings having hearing loss do not have facilities or no access to hearing healthcare due to long distance to hearing healthcare professionals including financial constraints, lack of awareness of having a hearing loss, lack of time to see a hearing healthcare provider, and not knowing how to access a provider (Hay-McCutcheon et al., 2021). Age group difference in mental health among hearing loss was found that 40-49 talk more on distress and somatization, 50-59 years old more complain about self-efficacy, depression and anxiety, somatization whereas no specific characteristic stood out in the 60-70 year age group, somatization increased by 2% for each dB of hearing loss, the impact of hearing disability was more before 70 years than after in elderly people.

Hearing status association distress, depression, somatization and loneliness in young and middle-aged adults are different in different age groups (Nachtegaal et al., 2009). Community surveys revealed the prevalence of hearing disability in the adult population varies between 10% and 20% (Davis, 1989).

Females reported higher levels of somatic symptoms and emotional distress than males also females reported more somatic symptoms at each level of emotional distress (Piccinelli & Simon, 1997). Somatic symptoms do not vary according to geography or level of economic development; and cultures did not differ markedly in the pattern of these associated features (Gureje et al., 1997). Rural residence was not associated with somatization and was more common among urban residents. Urban and rural differences were greatest among women and also associated with age difference and being separated, widowed, or divorced (Swartz et al., 1989).

Children with hearing aids had significantly higher levels of psycho-pathological symptoms and the device was related to internalizing symptoms, and communication skills predicted less psycho-pathological symptoms (Theunissen et al., 2015).

Somatic presentations are prominent in routine clinical practice and usually, when physicians cannot find a pathological basis for them, they are referred to as somatization or somatoform disorders, medically unexplained symptoms or functional somatic symptoms (Barsky & Borus, 1999). The functional somatic symptom is of psychological problem that cannot be explained in terms of a conventionally defined medical disease (Wessely et al. 1999). At least one-third of all physical symptoms in the general population (Kroenke & Price, 1993) and general medical-care settings (Kroenke et al., 1993) are medically unexplained. Different medical specialities tend to define their variants of such somatic syndromes, for example, Irritable Bowel Syndrome, Premenstrual syndrome, chronic pelvic pain, Fibromyalgia, Non-cardiac chest pain, Hyperventilation syndrome, Chronic (post-viral) fatigue syndrome and Atypical facial pain (Wessely et al. 1999).

Hearing Loss and Obsessive-compulsive- Neuro-psychological studies consistently found cognitive impairment in patients with Obsessive Compulsive Disorder (OCD). Such as anxiety, lack of confidence, indecisiveness, and associated clinical symptoms of OCD, along with impaired memory and attention (Deckersbach et al., 2000; Muller & Roberts., 2005). Psychopathological symptoms were more present in the tinnitus patients than in controls at 37.9% of depression, 47% of anxiety and 40% of OCD. Positive associations between depression, and anxiety with the concurrence of more than one psychopathological symptom; and the degree of tinnitus showed a strong correlation with anxiety, depression, and obsessive and mental health quality of life (Geocze et al., 2018).

The severity of tinnitus is associated with anxiety depression, and quality of life (Cho et al., 2013), and is proportional to the severity of tinnitus (Nondahl et al., 2002). The high degree of discomfort leads to obsessive thoughts and compulsive behaviours (Folmer et al., 2008). Tinnitus disorder involves the perception of sounds without a detectable external source (Cima et al., 2019) in about 30% of adults or ranging from 5.1 to 42.7% (McCormack et al., 2016).

Approximately one-third of adults with tinnitus experience and feel impaired in their daily performance (Tunkel et al., 2014). Studies focused on gender and tinnitus distress show conflicting results (Meric et al., 1998; Erlandsson and Holgers., 2001; Pinto et al., 2010; Seydel et al., 2013), and show gender differences regarding coexisting psychopathologies. There were gender differences in depression, anxiety, and stress among patients with tinnitus (Gomaa et al., 2014).

Research evinced that higher scores of depression and anxiety among female patients with tinnitus (Bashir et al., 2017), severe levels of tinnitus distress were more frequent in women (Gallus et al., 2015) and higher suicide attempts in women with more tinnitus complaints than men (Lugo et al., 2019). Gender is a relevant factor to determine OCD resulting from both biological and psychosocial factors such as sex-linked genetic features and hormonal differences; gender-related social roles may result in obsessions and compulsions as portrayed in a family history of OCD which may influence by hormonal characteristics. So the Gender differences in obsessive-compulsive disorder were there in the literature (de Mathis et al., 2011).

A study by Geocze and colleagues (2018) shows a significant correlation between various psychopathological conditions and tinnitus severity such as depression, anxiety and OCD; and the presence of more than one psychopathological symptom due to worsening tinnitus grade.

Hearing disability is 21.7% among U.S. adults (Li et al., 2014) and is more prevalent in rural areas—twice as common by one estimate (Brennan-Jones et al., 2015), and the prevalence associated with poverty (Brennan-Jones et al., 2015) and more prominent in rural communities. Adults with hearing loss are more than twice as likely to be unemployed or partially unemployed, and 25% experience a decrease in wages compared to those without hearing loss (Jung & Bhattacharyya, 2012), severe to profound hearing loss cost a very high expenditure over their lifetime due to decreased work productivity (Hjalte et al., 2012). Disability and economic impact adversely affect rural communities with higher poverty rates and unemployment. Hearing problems are more likely to have mood disorders social inferiority (Monzani et al., 2008) poorer quality due to hearing disability (Dalton et al., 2003).

Hearing Loss and Interpersonal Sensitivity - Hearing loss is more prone to depression, anxiety, interpersonal sensitivity, and hostility than subjects with no hearing problems (Monzani et al., 2008). People with hearing loss disturb having a barrier of communication and physical barriers, and negative attitudes toward coworkers (Punch et al., 2004) that communication stress, social isolation and uncooperative are complications constantly encountered by hearing loss person (Schroedel Geyer., 2000), negatively affecting social interaction and social relationships. People with hearing loss are rejected and isolated with an inability to education and leading to mental illness (Dammeyer, 2010). Four out of ten university students have problems with the poor sound environment resulting in difficulty in concentration, remembering and hearing what the lecturers and others say.

People with hearing loss have difficulty in interpersonal relationships which leads to having fewer friends than a normal hearing person with lower quality (Kouwenberg, 2013). Communication problems create difficulty in establishing friendships with hearing people leading to misunderstandings and intolerance, and to have fewer social relations (Bat-Chava et al., 2014)

Interpersonal sensitivity is a stable personality trait (Boyce & Parker, 1989), more sensitive to interpersonal relationships such as criticism and rejection. Interpersonally sensitive individuals are to meet the expectations of others and avoid the risk of rejection or criticism (Boyce & Parker, 1989) and can be described as a feeling of personal inadequacy, resulting in frequent misinterpretation of other people's interpersonal behaviour which, leads to discomfort, interpersonal avoidance, and insecure behaviour (Boyce & Parker, 1989; Davidson et al., 1989).

Interpersonal sensitivity may lead to depression (Boyce et al., 1991), social anxiety disorder (Harb et al., 2002; Kumari et al., 2012), anxiety (Vidyanidhi & Sudhir, 2009) and psychotic symptoms (Masillo et al., 2012). Women invest more time and effort in their interpersonal relationships than men (Kendler et al., 2001), and showed a higher preference for emotional and close communication, perceptiveness, and intimacy within interpersonal relationships (Cyranowski et al.,

2000) whereas some do not found any significant difference in interpersonal sensitivity between men and women.

Many contemporary studies indicated gender differences that women are more interpersonally sensitive than men (Hall et al., 2006), more emotionally sensitive than men (Bloise & Johnson., 2007) that women are associated with interpersonal sensitivity such as depression, anxiety, and social phobia (Boyce et al., 1991; Harb et al., 2002; Kumari et al., 2012; Masillo et al., 2012; Sakado et al., 1999; Vidyanidhi & Sudhir, 2009). Interpersonal sensitivity is reported to correlate with attachment insecurity and is found more frequently in women, this explains that women are more interpersonally sensitive than men (Chopik et al., 2013; Del Giudice., 2011; Magai et al., 2000).

Hearing-loss adults wait many years to seek assistance (Davis et al., 2007) due to a shortage of hearing healthcare specialists in rural regions (Windmill & Freeman, 2013), lack of diagnostic and intervention services results in rural patients being at a high risk of delayed treatment (Brach et al., 2003), limited access to speciality care for their hearing loss (Bush et al., 2014) that serve as barriers to rural adults compared with urban adults.

Hearing loss and Depression - One-tenth of older adults with hearing loss have depression that affected their hearing, vision, cognition, and mobility (Xiang et al., 2020). These rates are based on both clinical interviews and medical records (et al. 2009b); depression lifetime prevalence is at 26%; (Fellinger et al., 2009b) but depression and anxiety disorders differences were found in deaf inpatients who used ASL compared to hearing counterparts (Black & Glickman, 2006).

Tinnitus Hearing loss causes psychological pain that includes depression, anxiety, stress and mood swings (Abbas et al., 2019); social communication uncomfortable, isolation from social obligations, a sense of alienation, and depression (Strawbridge et al., 2000; Weinstein & Ventry., 1982). Research findings evinced that deaf or hard of hearing deal with the anxiety that impairs their lives

beyond day-to-day tasks (Ariapooran, 2017), disturb sleep habit (Clarke et al., 2019), high occupational stress, social anxiety, depression, agitation (Shoham et al., 2019).

People with hearing loss have a risk of depression (Knutson, Johnson, & Murray, 2006); hearing inability they cope with physical, behavioural, social, and emotional problems (Akram et al., 2018), may lead to depression reducing their quality of life (Ahmed et al., 2020). Research provided more internalizing symptoms among girls (Vostanis et al. 1997; van Eldik 2005; van Eldik et al. 2004; Dammeyer 2010) whereas boys experience more externalizing symptoms (Theunissen et al. 2013); mixed results about the relationship between psychopathology and socioeconomic status (van Eldik et al. 2004; van Gent et al. 2007; Theunissen et al. 2012), and more symptoms of psychopathology in families with lower SES (Barker et al. 2009; Theunissen et al. 2014).

Hearing Loss and Anxiety- Hearing loss invites anxiety, stress, fatigue, social alienation, and low social-emotional well-being (Arslan et al., 2018), adverse attitudes and actions that always happened when diagnosed with hearing loss in young adults with DHH (Newman & Newman, 2016). Anxiety is part of the human experience and prepares us to fight or flee from a situation hazard has a relationship with depression as both are constituted as two different constructs (Pais-Ribeiro et al., 2004).

Research provided that adults with hearing loss show more signs of anxiety than normal hearing (Shoham et al., 2019) but corrective surgery significantly decreases anxiety levels (Shoham et al., 2019), hearing loss anxiety results in more risk of severe mental health disorders (Abbas et al., 2019). Research findings evinced that deaf or hard of hearing deal with the anxiety that impairs their lives beyond day-to-day tasks (Ariapooran., 2017), disturb sleep habit (Clarke et al., 2019), high occupational stress, social anxiety, depression, agitation (Shoham et al., 2019), social anxiety/social phobia (Eleuteri et al., 2010), low social functioning, higher paranoia, phobic anxiety, paranoid ideation, social phobia, hard concern for self-appearance and interpersonal insensitivity (Eleuteri et al., 2010).

Hearing loss and tinnitus causes psychological pain that includes depression, anxiety, stress and mood swings (Abbas et al., 2019; Chepesiuk, 2005) and substantial impact isolation in older people (Pronk et al., 2014).

Several studies demonstrated that Presbycusis harms psychological well-being due to social isolation, depression, anxiety and cognitive decline in hearing loss-affected persons (Dalton et al., 2003; Heine et al., 2002). Research findings revealed hearing loss reduces normal social activities, and relationships with family or friends, and greater emotional difficulties in the work setting invite higher levels of anxiety, depression, interpersonal sensitivity and hostility (Baraldi et al, 2007).

Hearing loss effect on psychological function has been described as an unseen handicap with an enormous effect on self-esteem, communication, and everyday activities in combination with loneliness, depression, distress, anxiety, somatization, and decreased social functions (Mehboob et al., 2019; Nachtegaal et al., 2009).

A person's perceived social disability serves as a mediator between hearing disability and psychological distress including aggression (Ilyas & Muazzam., 2015), depression, anxiety, psychological distress, and emotional sensitivity as compared to people with normal hearing (Iwagami et al., 2019) but these individuals may not develop the symptoms of clinical depression and anxiety if under proper social support (Chen & Most, 2009). Acquired hearing difficulties are high on the level of general psychological distress due in part to isolation, loneliness, and withdrawal (Meadow-Orlans, 1985) manifested in heightened anxiety, depression, and sleep disturbance (Hallberg & Barrenas, 1995; Hetu et al., 1990).

Cross-sectional studies reported a wide variation in an overlap of depression and anxiety in somatic symptoms ranging from 23% to 66 % (Shidhaye et al., 2013), in Pakistan, it was estimated that 25% to 66% of women suffered from anxiety and depressive disorders whereby the complaints predominantly were somatic (Mumford et al. 1996; Mumford et al. 1997; Mumford et al. 2000). In Turkey it is determined that, about 23% of patients diagnosed with conversion disorder had some form of depressive disorder (Deveci et al. 2007).

Somatic complaints are the hallmark presentations of depression and anxiety in routine care, in particular in LMIC (Katon & Walker 1998). The prevalence of mood and anxiety disorders in the deaf population reports a significant difference in mood and anxiety disorders between deaf inpatients and hearing inpatients (Black & Glickman, 2006; Diaz et al. 2013) whereas others find no significant differences (Landsberger & Diaz, 2010; Pollard, 1994) but depression and anxiety disorders difference were found in deaf inpatients who used ASL compared to hearing counterparts (Black & Glickman., 2006).

Depression and anxiety in deaf adults were significantly higher and younger compared to hearing adults; the environmental factors such as information deprivation in the deaf like lack of understanding or access to information may increase vulnerability to trauma, and/or exacerbate traumatization of a particular event (Schild& Dalenberg, 2015); child maltreatment and poverty are linked to poorer psychological health outcomes later in life (Maniam et al., 2014) that adverse experiences during childhood alter brain functioning in stress response to cope effectively with stressors later in life (Chen & Baram, 2014; Kuhlman et al., 2015).

Deaf individuals experienced a more severe and chronic life experience in different forms like the inability to communicate with or participate in family conversations, being deprived of access to information, and linguistic neglect can potentially contribute to an earlier manifestation of mental health problems and reduced quality of life outcomes (Kushalnagar et al., 2017). Childhood hearing difficulty has an impact on adult mental health that is substantially associated with anxiety and low self-esteem which was found among women aged 20-39 years of age (Istad et al., 2019) but not among males.

Hearing Loss and Hostility - Hostility is thoughts, feelings, or actions characteristic of the negative affective state of anger resulting in aggression, irritability, rage, and resentment. Hostility is associated with occupational health behaviour like the use of hearing protection devices (HPDs) that negatively related to hostility as hostility

correlated highly with Low frustration tolerance due to the mediating role of perceived barriers, and low self-efficacy (Rabinowitz et al., 1996).

Research revealed a close association between hostility and anger with increased coronary heart disease (Chida & Steptoe, 2009) as around 19 % of prognosis heart diseases in population studies that predict a higher likelihood of recurrent myocardial infarction (Chaput et al., 2002) with cardiovascular-related death (Matthews et al., 2004), and predicts an incident Alzheimer's disease (Terracciano et al., 2014) and cancer-related mortality (Tindle et al., 2009).

High hostility relates to lower levels of social support (O'Neil & Emery, 2002), more interpersonal conflict (Siegler et al., 2003), more negative, and fewer positive interpersonal interactions (Brondolo et al., 2003), less recognition of positive responses from others (Kahler et al., 2012). Hostile people are more anxious, and receive lower support (Holt-Lunstad et al., 2007) with a constellation of psychosocial vulnerability (Smith, 2003). Hostility is associated with more smoking, alcohol use, physical inactivity, and poor eating habits (Siegler et al., 2003).

Hostility appears more in men and is largely explained by behavioural factors such as smoking and physical activity. Hostility has been linked to stress reactivity, exaggerated autonomic function, reduced heart rate variability, inflammation, and platelet aggregation. Mental stress is reported to enhance the risk of cardiovascular disease (Sandrini et al., 2020).

High hostility person is prone to more interpersonal conflict (Siegler et al., 2003), more negative, and fewer positive interpersonal interactions (Brondolo et al., 2003), hostility was greater in men than in women (Fava et al., 1996), and was greater among the subjects belonging to the urban areas than the subject belonging to the rural areas (Bisht & Sharma, 2021). Hostility impairs health (Brydon et al., 2010), employment (Judge et al., 2006), and quality of life (Shen et al., 2006).

Hearing loss and Phobic-anxiety- A phobia is an overwhelming, irrational, and persistent fear resulting in avoiding the object or situation, or fear of a specific thing or social setting (APA, 2013). Anxiety disorder includes generalized anxiety

disorder, panic disorder, and social anxiety disorder. The causes are uncertain and might include genetics, culture, and life events (Eaton et al., 2018), and the environmental or genetic influences have a more significant role varies by condition, with social anxiety disorder and agoraphobia having around a 50% heritability rate (Penninx et al., 2021). Whatever the cause may be but treatable and overcome with cognitive-behavioural therapy (CBT). It can occur through exposure to the feared object or situation, or sometimes merely by thinking about it resulting in dizziness, trembling and increased heart rate, breathlessness, nausea, sense of unreality, fear of dying, preoccupation with the feared object, and panic attack.

The prevalence rates of some common phobias can be explained as a social anxiety disorder that is a fear of social situations with unfamiliar people, scrutinizing, embarrassment, and humiliation. Specific phobias include five major categories—animal, natural environment, situational, blood-injected-injury, and "other" type; and the most common specific phobias are of closed-in places, heights, escalators, tunnels, highway driving, water, flying, dogs, animals, insects, thunder, public transportation, injuries involving blood, and dental and medical procedures (APA, 2013). It appears in early childhood, around age 7, and 9.1% of Americans have a specific phobia, and many people have more than one specific phobia.

Agoraphobia is the fear of situations that are difficult to escape like being alone outside the home in a crowded place or travelling by car, bus, or aeroplane. It is commonly associated with panic disorder, affecting only 0.9% of the American population (www.nimh.nih.gov); more than 40% are severe cases and less than half of the people with this condition receive treatment, the average age of onset is 20 years old, the highest prevalence in adolescent from ages 13 to 18 is 2.4%.

Hearing loss and Paranoid ideation-Paranoia is an instinct or thought process including anxiety and fear often accompanied by delusion and irrationality, beliefs of conspiracy threat towards oneself, making false accusations, and distrust of other people. A paranoid person has thought of the incident was intentional even an accident or coincidence. It is a central symptom of psychosis (Green et al., 2008),

and common characteristics are a biased perception of reality and the exhibition of hostile beliefs (Bentall & Taylor, 2006), feeling powerless, depressed, isolating themselves and relinquishing activities (Freeman et al., 2005), erotic, persecutory, litigious, and exalted (Deutsch & Fishman, 1963); and most tend to be of a single symptom.

Some research suggested a hierarchy of paranoia least is social anxiety and the most frequent exhibition of paranoia (Deutsch & Fishman, 1963). Paranoids seem associated with feelings of powerlessness, victimization, and a sense of being under external control. People living in a lower socioeconomic status are in less control of their own lives resulting in mistrust of others, and females have a higher tendency to believe in external control at a higher rate than males which leads to more susceptibility to mistrust with the effects of socioeconomic status on paranoia (Mirowsky & Ross, 1983).

It was also believed that parenting style can invite paranoia on account of being very disciplined, stringent, unstable, indulging, and pampering (Deutsch & Fishman, 1963). Experiences likely to enhance or manifest the symptoms of paranoia include increased rates of disappointment, stress, and a hopeless state of mind. (Deutsch & Fishman, 1963). It appears more in older patients and migrants who experienced higher levels of discrimination throughout their lives (Bentall & Taylor, 2006). They have low moods, grandiosity and guilt accompanied the functional paranoia (Lake, 2008).

Paranoid may be defined in cognition in terms of persecutory delusions and false beliefs as being harassed, threatened, harmed, subjugated, persecuted, accused, mistreated, wronged, tormented, disparaged, vilified, and so on by others (Izard & Masterson, 1981). It was suggested that the three components of paranoid cognition, suspicions that others are exploiting, harming, or deceiving them without any basis, preoccupation with unjustified doubts about loyalty, or trustworthiness to friends or associates and reluctance to confide in others with an unwarranted fear that the information will be used maliciously against him.

The "hierarchy" of paranoia exists, ranging from mild social evaluative concerns to persecutory beliefs concerning mild, moderate, and severe threats (Freeman et al., 2005). At least 50% of the diagnosed cases of schizophrenia experience delusions of reference and delusions of persecution (Sartorius et al., 1986). Paranoia perceptions and behaviour are a part of many mental illnesses such as depression and dementia but are more prevalent in paranoid schizophrenia, delusional disorder (persecutory type), and paranoid personality disorder.

Individuals with paranoid delusions always have a tendency to take action based on their beliefs (Bentall & Taylor, 2006) more than half have taken action or behaved as a result of these delusions and more common among offensive prisoners (Wessely et al., 1993). Such abusive behaviours and violent behaviours in psychotic individuals could be a result of their inability to cope with aggression, especially to potential threats in their environment (Bentall & Taylor, 2006).

A mild form of paranoid cognition seems to originate in social determinants than intra-psychoic conflict (Fenigstein & Venable, 1992; Kramer, 1994). People exhibit self-centred thoughts such as they are being talked about, suspiciousness about others' intentions, and assumptions of ill-will or hostility as an adaptive response to cope with a disturbing and threatening social environment (Kramer, 1994). Self-consciousness conduces to a hyper-vigilant and ruminative mode that stimulates social misperception and misjudgment (Kramer, 1998).

Social identity theory (Turner, 1998) explains gender, ethnicity, age, or experience appropriately explains people's behaviour as attributes making them unique in a social group. A dysphoric self-consciousness is an aversive form of heightened 'public self-consciousness' characterized by the feeling that one is under intensive evaluation or scrutiny (Kramer, 1995a; Sutton & Galunic, 1996) that can happen in paranoia. People experiencing hypervigilance and rumination of self-consciousness in an aversive psychological state, are highly motivated which promotes an elevated level of arousal, fear, anxiety, and threat perception (Lazarus & Folkman, 1984, 1998), it can increase negative thinking about negative events, and evoke a pessimistic explanatory style.

A common symptom of paranoia is an attribution bias (Bentall & Taylor, 2006), feeling powerless, depressed, isolating oneself, relinquishing activities (Freeman et al., 2005), erotic, persecutory, litigious, and exalted (Deutsch & Fishman., 1963). Hearing disability affects the development and severity of psychosis, the presence of paranoia and persecutory delusions, sensory deprivation (Daniel et al., 2014), social differentiation (Hoffman, 2007), and misinterpretation of communication (Linszen et al., 2016).

Cooper and colleagues (1974) describe a significantly higher level of paranoid psychosis in patients with conductive hearing loss than in patients with affective illness (Cooper et al., 1974). Research evinced a significant association between paranoid illness and bilateral conductive deafness with earlier age of onset, longer duration and greater (Cooper & Curry, 1976).

There is a positive relation between paranoid ideation and stressful life events or perceived stress (Johns et al., 2004), psychotic symptoms correlate with depression which leads to feelings of hopelessness (van Os et al., 2000; Hafner et al., 2005), and psychotic symptoms are associated with impulsivity among the low-income group (Compton & Kaslow, 2005). Studies psychoticism associated with panic attacks (Goodwin et al., 2004) and impulsivity (Compton & Kaslow, 2005). Research reported the association between acquired deafness and paranoia in elderly hearing loss. Patients with paranoid psychosis have a more severe degree of hearing loss (Cooper et al., 1974).

Hearing loss and Psychoticism- Studies have evinced that hearing disability is a risk factor for the development of psychosis or schizophrenia but mostly focused on elderly populations (Almeida et al., 1995), a significant hearing disability at the age of 18 years is a risk factor for the development of schizophrenia (David et al., 1995).

Research evidenced that hearing disability increases the risk for psychosis (Stefanis et al., 2006; van der Werf et al., 2007), more in young people (David et al. 1995; Thewissen et al. 2005). Psychosis may be caused by exposure to perinatal

infections affecting the central nervous system like as rubella and meningitis (Brown et al., 2000; Leask et al., 2002; Dalman et al., 2008) which can be used as an explanation of the hearing disability associated with psychosis as the direct or indirect consequence of processes triggered by hearing loss. Studies have demonstrated psychotomimetic effects induced by sensory deprivation (Leff, 1968) increase psychosis risk through social defeat stress (Selten & Cantor-Graae., 2007) and that early hearing disability has an impact on risk for psychosis by interfering with critical developmental phases for language, cognition and social skills (Bess et al. 1998).

Some factors may affect hearing acuity, resulting in transient or permanent impairment during childhood (Olusanya & Newton, 2007; Tharpe & Sladen, 2008) such as birth trauma (Herrgard et al. 1995), prenatal and postnatal exposure to infections (Dalman et al. 2008; Zammit et al. 2009) rubella and meningitis affect the central nervous system resulting in increased risk for hearing deficits (Fortnum & Davis, 1993) and psychosis (Brown et al., 2000; Leask et al., 2002; Dalman et al., 2008) that rubella increased the risk for non-affective psychotic disorder independent of hearing disability (Brown et al., 2000).

Research provided evidence that sensory deprivation, mimicking profound hearing loss, induces feelings of paranoia and hallucinations (Leff, 1968). Sensory restriction produces patterns of nerve impulses that give rise to hallucinatory experiences (Schultz & Melzack, 1991) and result in reality-testing failures that could be the underlying mechanism of experience of hallucinations (Leff, 1968; Bentall, 1990), social adversity moulding the risk for psychosis (Boydell et al., 2004) as all hearing disabled regardless of the time of onset and factors suffered from social isolation, low self-esteem and increased feelings of loneliness and stress (RomansClarkson et al., 1990; Bess et al., 1998; Paykel et al., 2000; Kramer et al., 2002).

The adverse emotional and social consequences of HI give rise to social defeat stress (Selten & Cantor-Graae, 2007) and are an underlying biological mechanism of psychosis (Selten & Cantor-Graae., 2007; van Winkel et al., 2008).

The early onset of hearing disability hampered the development of language, cognition and social skills (Bess et al., 1998), giving rise to developing psychotic symptoms later in life (Cannon et al., 2002).

Hearing Disability and Psychological Well-being:

Psychological well-being has been classified as having six categories, not much research has been done and the available research findings were put together under the following.

Self-acceptance- High in self-acceptance possesses a positive attitude toward the self; acknowledges and accepts multiple aspects of self, including good and bad qualities; feels positive about past life. Low in self-acceptance feels dissatisfied with self; is disappointed with what has occurred in a past life; is troubled about certain personal qualities; wishes to be different from what he or she is.

Children with hearing loss usually develop lower self-esteem than hearing peers based on differences in physical appearance because of wearing devices and physical differences related to a syndrome, and communication difficulties (Bat-Chava, 1993; Bat-Chava & Deignan., 2001; Huber, 2005; Weisel & Kamara., 2005). Children with earlier identification of hearing loss report more positive school self-esteem than children with later identification of hearing loss (Leigh et al., 2009).

Children with hearing loss having speech, language, and perceptual skills like hearing peers have a higher positive self-esteem rating than those poorer than their peers in children, adolescents, and adults (Blood et al., 2010; Boyle, 2013; Huber, 2005). Good communication skills promote higher social competence and increased self-esteem (Leigh et al., 2009) based on Successful communication for active participation in social environments that likely help shape social relationships outside of the home in reinforcing self-esteem (Stinson & Kluwin, 2011).

Positive relations with others- High in Positive relations are warm, satisfying, trusting relationships with others; are concerned about the welfare of others; capable of strong empathy, affection, and intimacy; understand give and take of human relationships.

Low in positive relations with others has few close, trusting relationships with others; finds it difficult to be warm, open, and concerned about others; is isolated and frustrated in interpersonal relationships; not willing to make compromises to sustain important ties with others. Acquired hearing difficulties are high on the level of general psychological distress due in part to isolation, loneliness, and withdrawal (Meadow-Orlans, 1985) manifested in heightened anxiety, depression, and sleep disturbance (Hallberg & Barrenas, 1995; Hetu et al., 1990) and significantly impact the family or significant others as well as the individual (Schein et al., 2001). It is important to acknowledge that psychological distress can be a factor in adjustment difficulties. Communication stress, social isolation, and unsupportive supervisors are among the difficulties encountered by many deaf and hard-of-hearing workers (Schroedel & Geyer, 2000).

Autonomy- high in autonomy is self-determining and independent; able to resist social pressures to think and act in certain ways; regulates behaviour from within; evaluates self by personal standards.

Low Autonomy is concerned with the expectations and evaluations of others; relies on judgments of others to make important decisions; conforms to social pressures to think and act in certain ways. Hearing loss limits communication with evident negative consequences in daily life (Olusanya et al., 2014) resulting in higher unemployment rates than the rest of the population. The limitations in hearing and understanding speech lead to fatigue and more recovery time (Kramer et al., 2006; Nachtegaal et al., 2009), and face significant physical and social challenges that contribute to social isolation and loss of autonomy with associated anxiety, depression, cognitive deficits and dementia (Lin et al., 2013).

Environmental mastery- High in environmental mastery has a sense of mastery and competence in managing the environment by controlling the complex array of external activities to make effective use of surrounding opportunities and the ability to choose or create contexts suitable to personal needs and values.

Low in environmental mastery has difficulty managing everyday affairs; feels unable to change or improve surrounding context; is unaware of surrounding opportunities; lacks a sense of control over the external world. Hearing disability is associated with poorer physical functioning (Viljanen et al., 2009) with slower walking speed (Li et al., 2012), also reduced in those individuals with hearing loss (Loprinzi, 2013). The mechanistic pathways underlie an association between hearing and poorer physical activity like lower cognitive load, poorer social engagement, reducing awareness of the auditory environment.

The purpose in life- High purpose life attitude has goals in life and a sense of directedness; feels there is meaning to present and past life; holds beliefs that give life purpose; has aims and objectives for a living.

Low purpose in life is lacking a sense of meaning in life; having few goals or aims, lacking a sense of direction; does not see the purpose of past life; having no outlook or beliefs that give life meaning. Several studies demonstrated that Presbycusis harms the quality of life and psychological well-being due to social isolation; depression, anxiety, and even cognitive decline have been reported in people with hearing loss (Dalton et al., 2003; Gates & Mills, 2005; Heine & Browning, 2002).

Personal growth- High in personal growth has a feeling of continued development; sees self as growing and expanding; is open to new experiences; has a sense of realizing his or her potential; sees improvement in self and behaviour over time; is changing in ways that reflect more self-knowledge and effectiveness. Low in personal growth has a sense of personal stagnation; lacks a sense of improvement or

expansion over time; feels bored and uninterested in life; feels unable to develop new attitudes or behaviours.

An individual with hearing loss is most likely to have trouble hearing including background noise in the classroom, and communication is often less than clear, thereby affecting access to education resulting high need for Social Security Disability Insurance and Supplemental Security Income (SSI) than those without education (Clarcq & Walter, 1997-1998). Most worrisome is the 44 % high school dropout rate among deaf students (Blanchfield, Feldman, Dunbar, & Gardner, 2001), compared with a general population rate of 19 %. In addition to employer resistance to hiring deaf individuals, the automation of many work functions has disadvantaged the unskilled deaf worker (Buchanan, 1999) resulting in lower educational achievement for deaf persons and continues to contribute to vocational difficulties.

Psychopathological comorbidities:

Deaf or profoundly hearing-impaired children who have cochlear implants have lower levels of psychopathological symptoms than children with moderate or severe hearing loss who have hearing aids (Theunissen et al., 2015). Research showed an increased risk of hearing disability in all psychosis outcomes such as hallucinations, delusions, psychotic symptoms and delirium, and early onset of schizophrenia. Potential mechanisms underlying psychosis in hearing loss person include loneliness, diminished theory of mind, disturbances of source monitoring and top-down processing and differentiation. Early assessment and treatment of hearing disability in patients with (high risk of) psychosis are much needed for psychosis treatment and prevention (Linszen et al., 2016).

The risk of delusions and hallucinations was associated with proxy genetic risk at 53% in parents, 47% in siblings, and 36% in controls but a non-significant effect was found for urban cities. The connection between delusions and hallucinations is associated with familial and environmental risks for psychotic disorders.

Sensory deprivation caused anxiety, depression, dementia, suicidality, and psychosis is higher in hearing people who have sensory deprivation than in the general population (Sahoo et al., 2022). Hearing disability is associated with psychotic symptoms with minor hearing difficulties but not hearing disability (Viertiö et al., 2014).

Children with early-onset hearing loss experience more social isolation, low self-esteem and depression (Fellinger et al., 2008; Margaret & Andrew, 2015; Johannes et al., 2012). Adult hearing loss has an impact on verbal communication which increases social exclusion and the risk of development of cognitive and functional impairments (Johannes et al., 2012), and more vulnerable to neglect, discrimination or violence (Shoham et al., 2018). Age-related hearing loss is associated with sadness, feelings of low self-worth or guilt, a loss of interest in daily activities, and disturbed appetite or sleeps that decrease concentration (Lawrence et al., 2020).

Studies found an increased prevalence of mental health including depression and anxiety in the hearing-loss population (Theunissen et al., 2014). Depression, anxiety, paranoid ideation and interpersonal sensitivity are more among older people with hearing loss than those with normal hearing (Johannes et al., 2012).

Hearing loss in high-income countries has more experienced emotional, and social loneliness (Contrera et al., 2017; Pronk et al., 2014), poor cognitive function (Jayakody et al., 2018; Loughrey et al., 2018), depressive symptoms (Hörnsten et al., 2016; Luanaigh et al., 2010; Sophia et al., 2015), anxiety symptoms (Øhre et al., 2011; Gomaa et al., 2014; Contrera et al., 2017) and other psychiatric conditions (Cole et al., 2002; Nirmalasari et al., 2016; Davies et al., 2017; Park et al., 2018).

Hearing loss contributes to almost 10% of dementia (Livingston et al., 2017), the association between mental conditions and physical/neurological conditions of hearing loss are due to biological or environmental factors resulting in mental health consequences.

Patients with hearing loss have significantly higher anxiety than normal hearing people (Cetin et al 2010) and an 11% lifetime prevalence of ‘unspecified anxiety disorder’ in people with hearing loss whereas 5.4% in the controls (Hsu et al., 2016). Greater levels of anxiety and stress were seen among patients with severe or profound hearing loss than in the general population (Per-Inge et al., 2016).

The relationship between behavioural and emotional disorders among children with hearing loss outcomes includes hallucinations, delusions and other psychotic symptoms (Blazer & Tucci, 2019). Other researchers found a significant association between hearing loss and self-reported psychotic symptoms at age 19 years (Stefanis et al., 2016) with increased psychotic symptoms among younger persons mostly those who are using a hearing aid (Boxtel et al., 2007). Older people with hearing loss had higher levels of insomnia (Werngren et al., 2003), impulse control disorders, pervasive developmental disorders, substance use disorders, mild mental retardation and personality disorders (Landsberger & Diaz, 2010).

Hearing loss has difficulty in dealing with the presence of background noise in industrial settings becoming a source of annoyance in the workplace (Hetu, 1994; Garcia et al., 1999). Workers with hearing loss have difficulty in their work environment with the use of telephones or videoconferencing, group communication situations, and difficulties presenting various speaker characteristics (Scherich & Mowry, 1997). So, communication stress, social isolation, and unsupportive supervisors are the difficulties encountered by hearing loss employees (Schroedel & Geyer, 2000).

Hearing loss effect mental health including psychological and social disorders (Adigun, 2017) such as depression, anxiety, and personality disorders can lead to self-harm and suicide attempts (Khezeli et al., 2019), Hearing loss reported high levels of Anxiety Disorders (ADs) higher than normal hearing peers (Shoham et al 2019) that physical handicap influences communication and cognitive functioning which increases psychopathological symptoms (Hindley et al., 1994; Kvam et al, 2007) and detrimental consequences for academic and psychosocial functioning.

Hearing loss faces social problems beyond a hearing person's experience which leads to developing mental health problems (Moeller, 2007).

Losing hearing hampered activities that have an impact on their psychological well-being (Moeller, 2007), and quality of life leading to isolation, anxiety and depression (Werngren-Elgström et al., 2003). Poor communication increases the risk of anxiety and depression associated with intense emotions in deaf and hard-of-hearing people (Hooper et al., 2004). Hearing disability causes more behavioural and emotional problems and social anxiety than normal people do (Hindley, 2005).

Social Anxiety disorder has been recognized as one of the most common anxiety disorders, it is an irrational fear of being evaluated or judged in social performance-based situations (Wild et al., 2008) due to negative judgment from another person which leads to confusion (Sosic et al., 2008).

The prevalence of Social Anxiety disorder is one of the three most common psychiatric disorders (Moitra et al., 2008) which increases when contesting adult expectations (Charmaraman et al., 2018) that significantly impair the quality of life and psychosocial functioning. Emotion is a biological response to situations coupled with the response to environmental events (Olatunji et al., 2007). Emotion regulation controls evaluate and modify one's emotional reactions in the pursuit of goals (Thompson, 1994), and prevents negative emotions and maladaptive behaviours (Olatunji et al., 2007).

Hearing loss unable to manage properly their emotions in the face of everyday events and exhibiting diagnostic symptoms, and internalizing disorders including depression and anxiety (Mennin & Farach, 2007).

Deaf or hard of hearing are found to deal with anxiety (Ariapooran, 2017), disturb sleep habits (Clarke et al., 2019), high occupational stress, social anxiety, social anxiety/social phobia and phobic anxiety (Eleuteri et al., 2010).

Research evinced that hearing loss person has a high level of psychological stress associated with fears of appearing incompetent, overcompensation, and lowered self-

esteem (Hetu, 1994), and fear of stigmatization that have a strong foundation in societal attitudes toward hearing loss (Ross,1994).

Children with hearing loss had higher levels of behaviour problems than normal hearing children due to communication problems (Stevenson, 2009) with parental expectations and demands (Brubaker, 2000) in hearing children. The higher parents disparage children with more ashamed and humiliation showed more aggression and behaviour problems (Brubaker, 2000).

Researchers found a feeling of isolation, frustration, and anxiety (Khan et al., 2020; Lindburg et al., 2021) associated with language, delayed all-round developmental progress (Figueras et al., 2008), cognitive decline (Lin et al., 2013), and depression (Li et al. 2016). Hearing loss of the sensorineural type (SNHL) causes of SNHL include ageing (Yamoah et al., 2020), infection (Brown et al. 2009), noise exposure (Lie et al. 2016), ototoxic drugs (Farzal et al., 2016), traumatic disruption of the otic capsule (Honeybrook et al., 2017). Chronic frustration and brain damage are the common factors in violence and hostility with the high prevalence of learning disabilities among deaf and hearing-impaired people (Vernon & Greenberg, 1999). The rural hearing loss experienced more problems reaching hearing specialists and was less likely to achieve a degree beyond high school, and more problems in getting job performance at 60% (Chan et al., 2017). Adult women with a greater degree of hearing loss with chronic not use of hearing aids have experienced more social isolation (Mick et al., 2014; Weinstein et al., 2016) resulting in loneliness which can lead to depression (Aylaz et al., 2012).

Adults living in rural towns had poorer outcomes than adults living in urban cities, and older adults living in rural areas require additional attention to improve their social connections and help to prevent physical and emotional decline (Hay-McCutcheon, & Cheimario, 2018). Psychological well-being influences the high quality of interpersonal relationships and develops throughout life a sense of self-determination (Casullo & Castro, 2002).

Psychopathological symptoms are negatively correlated with psychological well-being in Argentina (Casullo& Castro, 2002), Mexico (Pérez et al, 2010), and

Australia (Winefield et al., 2012) and those who perceive more psychological well-being have a lower level of symptoms of psychopathology affects overall development and prevent psychopathological consolidation (Winefield et al., 2012). A higher level of general psychological well-being is related to lower levels of distress and psychopathological symptoms in college students of Mexican (Pérez et al., 2010) and Australian (Winefield et al, 2012) college students.

The world is under COVID-19 (stemming from the virus: SARS-Cov-2) pandemic novel since 2019. It has affected almost everyone in the world and is accepted as the second deadliest of this century so far (Goodman & Schulkin, 2020; Washington Post, 2020) that has impacted people from all countries, continents, races, and socioeconomic classes (Shanafelt et al., 2020). This pandemic, like COVID-19, or other outbreaks of infectious diseases is not simply considered by the medical field but concerns all aspects of human life (Ansari & Yousefabad, 2020) like spatial distancing, home quarantine, and school and work closures (Taylor et al., 2010). It triggers Mental Health Problems such as anxiety, apprehension, and stress in coping with such dreadful situations (Limcaoco et al., 2020; WHO, 2020), and became an international public health emergency and threat to psychological resilience (Wang et al., 2020). This crisis predicted that a persisting pandemic has a substantial impact on an individual's psychological needs (Casale & Flett, 2020) after COVID-19 was declared a pandemic for the whole World, followed by the implemented precautionary measures such as spatial distancing, quarantine, self-isolation, etc to prevent COVID-19 contaminations. However, good practices imposed prolonging remaining indoors for extended periods affect risk factors for anxiety and stress disorders (Ansari & Yousefabad, 2020). People who are kept in isolation and quarantine experience substantial distress in the form of anxiety, frustration, uncertainty and symptoms of post-traumatic stress (Brooks et al., 2020) which is having a significant impact resulting in psychopathology (Lee, 2020; Lee & Crunk, 2020). COVID-19-related worries and fears are accompanied by anxiety, generalized anxiety, depression, and lower mental well-being (Al Banna et al., 2020; Faisal et al., 2020; Zubayer et al., 2020). Young people are more vulnerable to COVID-19's psychological impact because being not stable and in the transition

stages of their academic and professional lives make them more prone to experience high levels of stress, anxiety, and depression (APA 2013; Craven 2020; Zivin et al. 2009).

Research finding supports that adolescents experience high levels of anxiety and depression than adults (Mamun et al. 2019) in Bangladesh as college students were the most impacted group by COVID-19. The research finding of an age-specific association between hearing disability and psychotic experiences suggests that disturbance of development at a critical adolescent period may increase the risk for psychotic symptoms (van der Werf et al., 2011) leading to tension and anxiety (Ansari & Yousefabad, 2020). Studies show that outbreaks of infectious diseases have adverse effects on mental health (Akan et al. 2010; Petrosillo et al., 2020) had significant associations (Petrosillo et al., 2020; Wang et al., 2020) due to COVID-19 that around 24.9% of university students experienced anxiety in China (Cao et al., 2020).

Research in Bangladesh evinced a high prevalence of mild to severe depressive symptoms in urban areas (Islam et al., 2020), nearly 88% of college students experienced mild to severe anxiety symptoms (Islam et al., 2020), about 47% of universities students reported mild to extremely severe depression levels and 69.3% reported mild to severe levels of psychological impact due to the pandemic (Khan et al., 2020a).

Literature for the demographic is limited that demonstrating that COVID-19 or any other risk factors impact mental health for the general population, especially among hearing loss is almost not available which invites the present study to take up the challenge of framing prevention and intervention to give psychological care to the marginalized society. The research provided that the prevalence of Mental Health Problems among general student students at 40% had moderate to severe anxiety, 72% had depressive symptoms and 53% had moderate to poor mental health status, it may be expected that the hearing loss patients would have a much higher rate of anxiety compared with the general population.

The statement of the problems containing the objectives and hypothesis was presented in the next chapter, **Chapter - III: Statement of the Problem.**

CHAPTER- III: STATEMENT OF THE PROBLEM

Statement of the Problems:

Mental illness contributes significantly to the global burden of mental disorders, which 13% of disability-adjusted life-years lost (Vigo et al., 2016). It is therefore important to grasp how and to what extent environmental exposures affect mental health outcomes. In the past year, 20% of all adults worldwide suffered from a mental disorder. Mental disorders have a lifetime prevalence of two out of seven adults and will continue to remain a leading cause of disease burden (Steel et al., 2013). Such disorders have devastating consequences for people's quality of life and represent striking challenges for health systems as a whole. Thus, the reduction of mental disorders is a health priority in both developed and developing countries.

It was estimated that more than 1.5 billion people which was around 20% of the global population (roughly 430 million) are living with hearing loss. World Health Organization have estimated that the hearing loss population will be 700 million people by 2050 if no control or precaution has been taken more seriously (<https://www.who.int/health-topics/hearing-loss>, 2023). There are around 63 million people who are suffering from Significant Auditory Impairment, with a prevalence rate of 6.3% in the Indian population (WHO, 2023). According to the NSSO survey, it is estimated that around 291 persons per one lakh population are suffering from severe to profound hearing loss in India (NSSO, 2001), and out of these, a large percentage are children between the ages of 0 to 14 years, which affect a severe loss of productivity both in terms of physical and economic output; and even a larger percentage of the population suffers from milder degrees of hearing loss and unilateral hearing loss (<https://nhm.gov.in>).

The report on the global prevalence of sensorineural hearing impairment in 1985 (WHO, 1986) mentioned that 42 million people which was approximately 1% of the world's population are having moderate to profound hearing impairment. In 2011, the prevalence increased by 360 million, and 32 million were children below 15 years (WHO, 2017) which increased upto 466 million people or 6.1% of the world's population hearing loss in 2018 (WHO, 2018) and around 90% of people

with moderate to profound hearing impairment who were from low and middle-income countries. The mild and unilateral hearing loss in the world population has increased from 1.2 billion (17.2%) in 2008 to 1.4 billion (18.7%) in 2017 (GDB, 2017) indicating that it is becoming a serious public health issue and needs appropriate and well-coordinated global action.

Hearing loss affects 1.57 billion people worldwide, and projections suggest its raising will touch 2.45 billion in 2050 (Haile et al., 2019) which was recognized as the third leading cause of disability and the first leading cause of disability for those above 70 years of age. In addition to that, an unaddressed hearing loss affected worldwide expenditure on health care, education, productivity loss, and societal costs (McDaid et al., 2021) because of an estimated \$980 billion in expenses on hearing disability in a year as it affects the ability to communicate, language development, social interaction, quality of life, depression, cognitive decline, and dementia (Livingston et al., 2017; Lin et al., 2013).

Hearing loss has been recognized as the second cause of disability, and the top cause of the sensory deficit estimated at 0.3% of the population, 49.8% can hear only loud sounds or inability to hear at all (NSSO, 2020); 32% profound, 39% severe (NSSO, 2003) and 2.12% are afflicted with some disability among the hearing loss population in India. Studies show high rates of emotional and behavioural problems in deaf children are about two times higher than in normal-hearing children (Dammeyer, 2010; Fellingner et al., 2008 & 2009; Hindley, 2000; van Gent et al., 2007).

Assigned diagnoses of deaf and hearing psychiatric inpatients demonstrated much higher impulse control disorders in deaf than in hearing individuals (23% vs 2%), learning disabilities and pervasive developmental disorders (43% vs 3%) which has an impact on the frequency of personality disorder (Werngren-Elgström et al., 2003).

Hearing loss impact on living:

Hearing loss of any degree that is acquired after early childhood involves challenges and is distinctly different from those individuals with congenital or childhood hearing loss. Most aspects of deaf and hard-of-hearing children's lives may look similar to those of normal-hearing children but vary differently, especially in parent-child communication, emotional bonding, and the child's emotional, cognitive and social development (Hintermair, 2006; Wake, Hughes, Poulakis, Collins, & Rickards, 2004).

The average academic achievement levels of hearing-impaired children remain significantly lower than hearing children as they consistently have many obstacles and challenges in acquiring language skills including reading and writing, which delay their academic development and may be able to reach approximately sixth grade which is much below the appropriate class level for hearing children peers by the age of 15 years (Karchmer & Mitchell, 2003).

Recent research findings contradict the earlier findings that there is no significant difference in the performance between hearing impairment and normal hearing children in Mathematics (Gowramma, 2014) as hearing loss children have difficulty in abstract mathematical exercises due to difficulty in abstract thinking (Paranjape, 1998); hearing loss children have arithmetic problems and perform poorly (Hyde et al., 2003) but education in regular schools may help them to get a grade-appropriate achievement (Gowramma & Elizabeth, 2016). All these findings show that deafness affects a student's ability in academic development (Paul & Jackson, 1993). Children with mild-to-moderate hearing loss cannot reach expectations level appropriate to their age-level ability on cognitive ability tests (Greenberg et al., 1985). Hearing-impaired children differed in non-verbal intelligence including language, mathematics, science and social science and showed a significant difference from normal hearing children (Panda, 2016) mostly caused by their hearing disability.

Some researchers said that they can think, learn or behave like hearing peers but differences in their environments and experiences result in their learning and organising knowledge in different ways (Marschark & Wauters, 2011), and identification of such differences is critical for optimal learning (Hauser et al. 2008) as they have a variety of visuospatial advantages over hearing individuals (Emmorey, 1993).

The deaf and hard-of-hearing students who have studied in mainstream colleges showed less content knowledge in natural science, social science and mathematics than hearing children (Spencer & Marschark, 2010), and have more difficulty in integrating Science, Technology, Engineering and Mathematics, and gaining information from classes, textbooks and other study materials (Richardson et al., 2000) resulting in higher-level misconceptions about the nature of learning (Hammer, 1996; Redish et al., 1998). Studies provided that normal hearing students can attend the simultaneous presentation of verbal and nonverbal materials facilitating information, with better integration that results in faster learning, better retention, and greater application (Presno, 1997) than hearing loss students. The deaf and hard-of-hearing learners are dependent on the visual reception of language through sign language, real-time text, or speech-reading (Johnson, 1991), and usually perform below their age-appropriate grade levels which makes them more prone to social isolation or exclusion than their counterparts (Punch et al., 2007).

Hearing-loss children educated in special schools adopt the instructional material in science resulting in better performance on post-tests than on pre-test (Sharma, 1992). A supplementary education programme for hearing-disabled children helps language development because socialization results in speaking boldly; creating the eagerness to express themselves and parents can also receive the right concepts regarding their hearing-impaired children (Sadashive, 1991).

Piaget (1964) proposes that the delayed emergence of some cognitive abilities is due to the lack of experience and language difficulties but not the cognitive functioning level in children with hearing impairment. The normal hearing children have better behavioural functioning whereas the deaf and dumb children exhibited

low self-concept but not much difference in independence, responsibility and maturity than normal children (Sadashive, 1991).

Several studies showed that hearing-loss children and normal hearing students do not have much difference in intelligence but normal children performed better with fewer errors (Mohapatra, 1991). Hearing loss children differ from normal children in perceptions of parental behaviour, perspective-taking ability, and cognitive functioning (Kapoor, 1990). The auditory deprivation results in poor communication in social, psychological and many other aspects of life (Adams, 1987) such as social and Mental Health Problems due to communication difficulties and adjustment problems in their personal and social life.

The hearing disabled persons are more prone to depression, anxiety, interpersonal sensitivity, hostility (Monzani et al., 2008), problems and sociological maladjustment (Tidball, 1990), restless, distractible, irritable, hypersensitive, aggressive, lack of perseverance, self-conscious, crying over minor annoyances, shy, suggestible, lack self-confidence, and shows temper outbursts, demanding and nail-biting (Dharitri & Murthy, 1990). Lack of hearing has a major impact on learning ability and cognitive development and also causes depression (Afrooz, 2009). It is also found in elderly people (Boi et al., 2012). The use of hearing aids reduces depression and improved life, it can also lower social relations in hearing loss (Fellinger et al., 2007), and the use of hearing aids improves the psychological condition (Heine & Browning, 2002).

Profound hearing loss impact social functioning including family relations, peer relations, risk-taking behaviour, social interaction, conformity to social standards and ethical behaviour (California State Department of Education, 1986), personality, and social and emotional development (Davis, 1981) that alter their environmental perception and psychological consequences (Jaffe, 1977) as social acceptance or rejection to children's behaviour (Davis, 1981). Deaf children demonstrate a greater proclivity to manifest behaviour problems (Freeman et al., 1981; Meadow, 1980; Schlesinger & Meadow, 1972; Vernon & Andrews, 1990) as they may be disobedient, restless, possessive, overly dependent, egocentric, tense,

non-compliant, unhappy, inattentive, and quick to throw temper tantrums (Furth, 1973; Gregory, 1976; Levine, 1981); with higher loners and inattentive (Cotton, Grunfast & Stove, 1989). Deaf children are more socially immature than their hearing counterparts (Furth, 1973; Levine, 1981; Meadow, 1980; Sanders, 1988; Schlesinger & Meadow, 1972).

Research findings provided that hearing impairment significantly impacts by limiting activity and restricting participation, and it increases as hearing levels worsened with increased difficulty to communicate in everyday life and problems related to involvement in life situations (Hickson et al., 1999; Morgan et al., 2002; Stumer et al., 1996). Hearing impairment negatively influences subjective well-being in older people (Scherer & Frisina, 1998).

Causes of hearing loss:

Researchers found many factors for the rising of hearing loss including demographic changes attributable to global population growth and improved life expectancy (Olusanya et al., 2014). Many countries still lack programmes to reduce exposure to risk factors such as occupational and recreational noise, misuse of drugs (Olusanya et al., 2014), non-availability of screening instruments with the technician, and vaccines for prevention such as measles, mumps, rubella and bacterial meningitis (Wilson et al., 2017). Many factors of hearing loss are preventable through appropriate interventions including community-oriented health education (Davis & Hoffman, 2019). Hearing loss of the sensorineural type causes includes ageing (Yamoah et al. 2020), infection (Brown et al. 2009), noise exposure (Lie et al. 2016), ototoxic drugs (Farzal et al. 2016), traumatic disruption of the otic capsule (Honeybrook et al. 2017), and single-gene mutations (Shearer et al. 1993).

Additionally, some factors affecting hearing loss are perinatal infections (rubella) and syndromal causes of deafness which are associated with other disabilities and poor mental health (Brown et al., 2000; Dammeyer, 2010). A hereditary cause for permanent childhood hearing impairment was recorded at 39%, an acquired cause at 30%, miscellaneous causes at 7%, and unknown causes at 24%;

and the acquired cause is mostly through congenital cytomegalovirus infection and meningitis caused by 39% of individuals with profound hearing loss, and the cause was unclear for only 9% (Korver et al., 2011). Some conditions in children such as learning disabilities/ mental retardation (9%), developmental delay (5%), specific learning difficulties (8%), visual impairment (4%), autism (2%), neurodevelopmental problems (30%) and intellectual disabilities (26%) are associated with hearing impairments (Van Naarden et al., 1999).

Childhood hearing loss harms early language development, academic performance, relationships with others, and future vocational opportunities (Bess et al., 1998; Lieu 2004; Kennedy et al., 2006). The World Health Organization (WHO) estimates that 60% of hearing loss in children is preventable (Krug et al., 2016). The majority of preventable childhood hearing loss is infection-related like acute otitis media and other infectious illnesses that lead to chronic middle ear disease and ultimately result in hearing loss (Krug et al., 2016).

Environmental exposures such as smoke from a wood-burning stove used to cook or heat the home have been shown to increase the risk of ear infections in other rural regions like West Africa (Amusa et al., 2005). In addition, exposure to cigarette smoke is also one of the risk factors for acute otitis media in young children, regardless of urban or rural status (Rosenfeld et al., 2004). Some risk factors also mentioned by different researchers are household crowding for the development of acute otitis media (Bowie et al., 2014), other infectious diseases like meningococcal meningitis (Baker et al., 2000), acute respiratory infections (Murray et al., 2012); living in a household without access to plumbed (running) water may cause upper respiratory infections, bacterial infections (Hennessy et al., 2008; Hennessy & Bressler, 2016), and also ear infections.

Hearing loss and Mental Health Problems

Several studies found that hearing loss patients showed a significant difference between normal hearing groups including somatization, interpersonal sensitivity, depression and psychosis (Moreno-Gómez et al., 2017). Patients with

congenital deafness showed different levels of “somatosensory deletion” affecting interpersonal sensitivity, anxiety and hostility, and scored higher which were significantly higher than normal hearing groups. The hearing loss diagnosed depression or anxiety disorder was significantly higher (25%) than normal hearing and occurred at an earlier age (45 years) for deaf adults compared to hearing adults (56 years). Deaf adults have higher depression or anxiety disorders with earlier onset compared to the general population (Kushalnagar et al., 2019).

The burden of hearing loss throughout the life course is substantial and it can be worsened by negative societal attitudes and prejudice towards affected people accompanied by adverse consequences hampering their psychosocial well-being, quality of life, interpersonal communication, and economic independence (Huddle et al., 2017; Olusanya et al., 2014), and also educational and vocational achievement. The disability of hearing loss results in social isolation with stigmatization, abuse, psychiatric disturbance, depression, relationship difficulty, restricted career choices, occupational stress, and low earnings (Shield, 2019). The adverse impact of unaddressed hearing loss on health, education and productivity for society is devastating (WHO, 2017), along with the rise in the number of people with hearing loss across the world.

Hearing-impaired leads to behavioural problems, emotional problems, and peer problems but is obvious to inattention (Fellinger et al., 2008); while hearing loss affected the quality of life and mental health but it is not related to the level of hearing impairment, and the normal hearing children have better behavioural functioning than the deaf and dumb children (Sadashive, 1991).

Several studies provided that hearing-loss children and normal hearing students do not have much difference in intelligence except normal children performed a little better with fewer errors (Mohapatra (1991); hearing-loss children do not differ from normal children in perceptions of parental behaviour, perspective-taking ability, and cognitive functioning (Kapoor, 1990). The auditory deprivation props up poor communication resulting in social, psychological and many other aspects of life (Adams, 1987).

Hearing loss has a profound impact on the social functioning of affected children which includes family relations, peer relations, risk-taking behaviour, social interaction, social standards and conformity, ethical behaviour (California State Department of Education, 1986), personality, and social and emotional development (Davis, 1981); and alter their environmental perception and psychological consequences (Jaffe, 1977) of social acceptance or rejection that closely related to children's behaviour (Davis, 1981). Deaf children demonstrate a greater proclivity to manifest behaviour problems (Freeman et al., 1981; Meadow, 1980; Schlesinger and Meadow, 1972; Vernon & Andrews, 1990) such as being disobedient, restless, possessive, overly dependent, egocentric, tense, non-compliant, unhappy, inattentive, and quick to throw temper tantrums (Furth, 1973; Gregory, 1976; Levine, 1981; Sanders, 1988). Deaf children are highly loners and inattentive (Cotton, Grunfast & Stove, 1989). They are more socially immature than their hearing counterparts (Furth, 1973; Levine, 1981; Meadow, 1980; Sanders, 1988; Schlesinger & Meadow, 1972).

Children with hearing impairments in Denmark showed a prevalence of psychosocial difficulties which was three times greater than in other children (Dammeyer, 2010). Despite the high prevalence of mental health problems in people who are deaf or hard of hearing, the degree of hearing loss has not yet been proven to correlate with mental health. In a follow-up study of a 5-year birth cohort with a mean age of 8 years; moderate-to-profound hearing loss (Stevenson et al., 2010), the rate of behavioural problems was at least twice more in the hearing control group. However, the severity of hearing loss did not affect the rate of behavioural problems (Fellinger et al., 2008; Dammeyer, 2010; Hintermair, 2007). A study was conducted among the Austrian deaf community (Fellinger et al., 2005), wherein individuals scored higher on all the symptom scales, and women scored higher anxiety and somatisation than men, but both sexes had similar amounts of paranoid ideation, depression, and interpersonal sensitivity.

United Nations Organization explicitly recognizes the need for a better quality of life and opportunities for optimal well-being throughout the life course of

all people with hearing disabilities (UNO, 2015) and has framed sustainable goals including the prevention of deafness and hearing loss (WHO, 2017), the Rights of Persons with Disability (UNO, 2015) to curtail the growing burden of hearing loss. These global initiatives for hearing health care needed better mechanisms to monitor the progress including specific, measurable and time-bound targets to reduce the number of people with hearing loss.

Somatization: Somatization has high psychiatric co-morbidity with anxiety and depression, patients with somatoform disorders suffer from anxiety at 20.4% (Ritsner et al., 2000) and depressive disorders at 30% (Löwe et al., 2008); and high prevalence among women, older people, and widowed or divorced individuals (Ritsner et al., 2000), commonly occur in people with low socio-economic status and low educational level (Abdolmohammadi et al., 2018). There are limited studies on somatization and its risk factors (Heidari et al., 2017; Noorbala et al., 2017).

Studies demonstrated that 20.4% (Ritsner et al., 2000) or 30% (Löwe et al., 2008) of patients with somatoform disorders suffer from anxiety and depressive disorders concurrently. Approximately 80% of mental disorders occur in low or middle-income countries (Jacob & Patel, 2014) including depression, anxiety, and somatizations are more frequent (Hanel et al., 2009). A study based in Iran showed that the prevalence of somatization (29.8% of cases) and anxiety (29.5% of cases) was significant with higher somatization in females, people living in urban areas and older age people (Garrusi et al., 2019). It further revealed that the frequency of no somatization was 23.7%, mild at 42.6%, moderate at 23.5% and severe levels at 13.2%; and the prevalence in primary care is high as 13.2% of patients had severe symptoms (Garrusi et al., 2019).

Women, older people, and widowed or divorced individuals reported somatic symptoms more than others at a significant level (Ritsner et al., 2000). Studies show somatization occurs commonly in people with low socio-economic status and low educational levels (Abdolmohammadi et al., 2018).

Obsessive-Compulsive: The OCD prevalence is 3% of the population which is about 1 in 40 adults, and 1 in 100 children in the U.S. (Anxiety and Depression Association of America), and higher prevalence in females at 1.8% than males at 0.5% (Harvard, 2007).

Research suggested it is inheritable, with a 25% chance to develop OCD within the immediate family member before the age of 25 (Stanford Medicine, 1992); half of the adults with OCD (50.6%) had a serious impairment, 34.8% or one-third of adults with OCD had a moderate impairment, and only 15% of adults with OCD had mild impairment (www.health.harvard.edu, 2007). The research available in India (Khanna et al., 1993) found that the lifetime prevalence of depression among hearing loss is 0.6%. It is not clear why the lifetime prevalence rate of OCD is lower in some countries (Bebbington, 1998). However, further research is needed into the epidemiological aspects of OCD since the data available is limited.

Interpersonal Sensitivity: Hearing loss consistently experience communication barriers at work or in leisure time. These communication barriers lead to difficulties in achieving social inclusion, and in some circumstances meet social exclusion. Being a social animal, every human being has to develop socialization and social development which is the ability to interact socially. The agents of socialization such as social interactions and social relationships are important for both identity and self-esteem which affect their physical and psychological well-being (Rose & Montemayor, 1994) as it is not possible to grow oneself without social interaction and social relationships (Mead, 1976).

Communication is mostly based on verbal conversation which is very difficult for hard-of-hearing people due to the background noise in social environments that impede their hearing (Goldblatt & Most, 2018; Haynes, 2014). Self-esteem and differentiation depend on the person's perception of how other people perceived him/her. Having a hearing disability limits their communication ability which makes it difficult to have social contacts and thereby potentially exclude them from social relations in school and at work (Davidsson & Petersson, 2018).

Those who are hard of hearing maybe socially excluded by others not due to their perception but due to their difficulty in communicating with hearing people. It is difficult to have spontaneous social interactions and maintain social relationships (Tjørnhøj-Thomsen & Philipsen, 2021) while good social skills are crucial for success in the labour market (Deming, 2017) and society (Caprara et al., 2000; Malecki & Elliot, 2002). Barrier including communication complication develops a negative attitude from coworkers (Punch et al., 2004). One of the main negative impacts of hearing loss is that it impairs the individual's ability to communicate with others and take part in discussions (Hallam et al., 2008; Morgan-Jones, 2001). Therefore, hearing loss negatively affects social interaction and social relationships making them rejected and isolated which ultimately leads to mental illness (Dammeyer et al., 2010; Elksnin & Elksnin, 2006).

Hearing-loss individuals usually have fewer friends than their hearing peers with lower quality (Kouwenberg, 2013) due to misunderstandings and intolerance characterized conversations (Bat-Chava et al., 2014 & 2005). As a result, maladaptive/poor communication strategies combined with hearing impairment lead to failure in their roles which eventually reduce their self-esteem (Espmark et al., 2002). Research demonstrated that hearing loss people are more prone to depression, anxiety, interpersonal sensitivity, and hostility than subjects with no hearing problems (Monzani et al., 2008). Research findings demonstrated elevated levels of anxiety, depression and interpersonal sensitivity among the hearing loss samples as interpersonal sensitivity is a psychological reaction to frustration due to their hearing disabilities (Monzani et al., 2008).

Depression: Depression is a common illness with an estimated 3.8% of the population affected, including 5.0% among adults and 5.7% among adults older than 60 years worldwide (GHDE, 2021); and the prevalence rate for India is 4.50% in the year 2022 (<https://mindvoyage.in>). The prevalence of mood and anxiety disorders in the deaf population reports a significant difference in mood and anxiety disorders between deaf inpatients and hearing inpatients (Black & Glickman, 2006; Diaz, Landsberger, Povlinski, Sheward, & Sculley, 2013) whereas others find no

significant differences (Landsberger & Diaz, 2010; Pollard, 1994) but depression and anxiety disorders difference were found in deaf inpatients who used ASL compared to hearing counterparts (Black & Glickman, 2006). According to World Health Organization (2005), depression is one of the leading causes of disability (Frojd et al., 2008), and is 50% higher among women than men in hearing loss (WHO, 2008).

The prevalence rates of internalizing disorders in children who are hearing disabled are approximately 27% and that of externalizing disorders is 18%. These rates are based on both clinical interviews and medical records (van Gent et al., 2007; Fellingner et al., 2009b). Hearing-impaired children reported more symptoms of depression than normally hearing peers (Theunissen et al., 2011). However, the negative effects on children with hearing loss can be reduced by providing adequate language and communication skills resulting in lower levels of psychopathology (van Eldik et al., 2004; Percy-Smith et al., 2008; Barker et al., 2009; Fellingner et al., 2009a; Stevenson et al., 2010).

An estimated around 2.6 million rural adults suffer from depression. The unadjusted prevalence of depression was significantly higher among rural than urban populations (6.1% versus 5.2%). After adjusting for rural/urban population characteristics, however, the odds of depression did not differ by residence. Depression risk was higher among persons likely to be encountered in a primary care setting: those with fair or poor self-reported health, hypertension, limitations in daily activities, or whose health status changed during the previous year (Probst et al., 2006).

The literature describes that hearing loss negatively impacts psychosocial health and cognitive functioning (Brink & Stones, 2007; Kramer et al., 2002; Lin et al., 2011) such as the quality of life and overall ability to function, more physician visits and hospital visits (Green & Pope, 2001; Kurz et al., 1991; Zazove et al., 1993), more hospitalizations (Genther et al., 2013), experiencing more difficulties and delays in accessing health care (Pandhi et al., 2011) with a higher number of hospital admissions compared to normal-hearing peers. Hearing loss increases medical

misdiagnosis (Crews et al., 2004; Jorgensen et al., 2016) resulting in a longer and more expensive length of stay (Grue et al., 2009; Lin et al., 2012) and poor provider-patient communication resulting in a misunderstanding of health choices, discharge instructions with medication directions, and possible unplanned readmission. Patients with hearing loss have less success in hearing, understanding, and remembering new information in the hospital compared to normal hearing (Choiniere et al., 2010; Pope et al., 2013; VanCott et al., 1993).

More than 90% of DHH (deaf and hard-of-hearing) children are born into hearing families who do not know how to provide an optimal language environment for DHH children (Mitchell & Karchmer, 2004; Moores, 2001). The hearing status of DHH children is not detected until 2 and 3 years of age, whether their language development was delayed or impaired is not known (Vaccari & Marschark, 1997). Even the consequences for parent-child communication, emotional bonding, and the child's emotional, cognitive, and social development are not known (Hintermair, 2006; Wake, Hughes, Poulakis, Collins, & Rickards, 2004).

Despite the high prevalence of hearing loss in older adults, the condition remains undermined or neglected across community settings and during hospital stays (Hardin, 2012; Iezzoni et al., 2004). Deaf and/or hard of hearing (DHH) from birth or childhood with mental disorders are neglected in academic research (De Bruin & de Graaf, 2004/2005; Diaz, Landsberger, Povlinski, Sheward, & Sculley, 2013; Fellingner, Holzinger, & Pollard, 2012) as only very few studies have been published (Diaz et al., 2013; Pollard, 1994); besides, methodology used also varies considerably. Most prevalent studies include mood disorders (13%-47%); neurotic, somatoform, and stress-related disorders (19%-32%); alcohol and drug-induced disorders (3%-28%); and psychotic disorders (8%-27%) with limited backgrounds, preferred languages, and modes of communication but differences in language or mode of communication were not fully explored. There is little discussion on the language heterogeneity in samples of DHH patients (Black & Glickman, 2006; Brown & Cornes, 2015; De Bruin & de Graaf, 2004/2005; Diaz et al., 2013; Fellingner et al., 2012).

Anxiety: Anxiety attacks in socially anxious people as described by Robert Burton in his book, 'The Anatomy of Melancholy, a year back in 1621. **Anxiety** prevalence was higher in hearing-impaired people in 8/10 studies with a comparator non-hearing impaired group (Shoham et al., 2019), and quality-of-life score was associated with lower anxiety (Bruggemann et al., 2017).

The prevalence of anxiety disorders in women is approximately twice as high as in men; the common factors are childhood sexual abuse, chronic stressors, and genetic and neurobiological factors for the higher prevalence in women (Bandelow et al., 2015). Most studies show a significant correlation between SAD, agoraphobia, panic, agoraphobia, major depression and dysthymia (Kessler et al., 2005). Anxiety disorder was estimated that 22.8% had a serious impairment, and 33.7% had moderate impairment among adults, a majority of people experienced mild anxiety 43.5% (HMS, 2007).

The National Comorbidity Study Replication (NCS-R) reports the prevalence of any anxiety disorder was estimated at 19.1% among U.S. adults aged 18 or older, higher for females at 23.4% than for males at 14.3%, and at least 31.1% of U.S. adults experience any anxiety disorder at some time in their lives (HMS, 2007). A study among hearing-loss adults aged 76 to 85 living in an institution showed that 32% have high anxiety (www.healthyhearing.com, 2023). Community studies reported a lifetime prevalence of anxiety disorder at 11.1% whereas a higher prevalence ranged from 15.4 to 31.3% among people with acquired hearing impairment, anxiety disorders are very common. A survey conducted in Europe in 2004 among adults estimated the lifetime prevalence of any anxiety disorder at 13.6% and the 1-year prevalence at 6.4% (Alonso et al., 2004). Social anxiety disorder (SAD) is a common psychiatric disorder with a lifetime prevalence rate of 12.1% (Kessler et al., 2005).

The most prevalent mental illness in the United States is an anxiety disorder and well-documented gender differences in prevalence, course, and symptom expression, women are twice as likely as men to experience panic disorder (Grant et al., 2006; Kessler et al., 2006). Different etiological factors have been suggested to contribute to gender difference including increased physiological reactivity, and

negative affectivity (McLean & Anderson, 2009) but no consensus on the specific mechanism(s) that contribute to increased anxiety in women. Anxiety disorders have very high co-morbidity including substance abuse, alcoholism, and major depression, and impaired the ability to develop social relationships and worsen the quality of life. Severe anxiety has also been linked to high rates of suicide (Chand & Marwaha, 2022).

Geographical location is one factor influencing mental disorders (Silva et al., 2016) as the difference in the prevalence of mental disorders between urban and rural geographical areas has been an endless debate (Allardyce et al., 2005; Dube, 1970). Higher levels of anxiety disorder were also found in the urban area of Germany (Vassos et al., 2016). The prevalence of anxiety disorders was higher in urban and school students while the prevalence of all other psychiatric disorders was higher in rural school students (Pahwa et al., 2019).

Anger / Hostility: Chronic frustration and brain damage are the common factors in violence and hostility with a high prevalence of learning disabilities among deaf and hearing-impaired people (Vernon & Greenberg, 1999). Hostility appears more in men and is largely explained by behavioural factors such as smoking and physical activity. Hostility has been linked to stress reactivity, exaggerated autonomic function, reduced heart rate variability, inflammation, and platelet aggregation; and mental stress is reported to enhance the risk of cardiovascular disease (Sandrini et al., 2020). Research evinced that hostility was greater in men than in women (Fava et al., 1995), and was greater among the subjects belonging to the urban areas than the subject belonging to the rural areas (Bisht & Sharma, 2021).

Very little research literature is available about hearing loss and violence, the most important finding was the high occurrence of hearing loss among inmates of correctional facilities. Hearing-impaired youth are poorly educated and not well prepared for work and life in general resulting in frustrations and anger toward society. Their anger and aggression manifest in underachievement, substance abuse, domestic problems, etc. which may be one factor contributing to hostility symptoms

among hearing-impaired persons than normal hearing activities at correctional facilities. Frustration raises hostility and leads to antisocial behaviour such as violence. Another factor of high violence among deaf and hearing-impaired is brain damage which is related to neurological and biochemical factors. A factor that contributes to violence is learning disability which is associated with an increased rate of imprisonment (Vernon & Greenberg, 1999).

Phobic Anxiety: Phobia anxiety disorder (Social Anxiety) generally appears in adolescence at 13 years of age, approximately 7.1% of the adult population and 5.5% of the teenage population are affected (www.nimh.nih.gov), and about 30% have severe symptoms; only about 40% are being treated or receiving an intervention. Worse is the majority are waiting for 10 years or more before they seek treatment. Women are slightly more affected than men with social anxiety disorder.

The National Institute of Mental Health (NIMH) found that between 8.7 to 18.1 % of Americans have phobias (Kessler et al., 2005b), it is the most common mental illness among women in all age groups and the second most common illness among men after 25 years of age, and 4 to 10 % of all children experience specific phobias during their lives (Bolton et al, 2006) and occur in 1 to 3 % of children (den Boer et al., 1997). Higher cases were observed in females (25.5%) than in males (12.4%) as 21.2 % of women and 10.9 % of men have a single specific phobia while multiple phobias occur in 5.4 % of females and 1.5 % of males. Women were also four times higher than males to have a fear of animals was 12.1% in women and 3.3 % in men (Fredrikson et al., 1996). The prevalence of specific phobias in adolescents is higher at 15.1%; females have specific phobias more than twice of men.

Paranoid Ideation: Paranoid ideation is characteristic of psychotic illness, but, like other psychotic phenomena, may be widespread in non-clinical populations (Freeman et al., 2005). Paranoid ideation is characteristic of psychotic illness, but, like other psychotic phenomena, may be widespread in non-clinical populations.

Wariness becomes a clinical problem when it is excessive, exaggerated or distressing, or interferes with functioning, and may precede delusion formation (Kaymaz et al., 2012) resulting in paranoia ideation such as others are watching or talking about them (Freeman et al., 2007) and there is increasing empirical evidence for links between effect and paranoia (Wigman et al., 2012).

The research found a significantly higher level of paranoid psychosis inpatients with conductive hearing loss and affective illness than in patients (Vander-Werf et al., 2011). Theorists posited that delusions (Kraepelin, 1899/1989) as unpleasant emotions may lead to persecutory delusions (Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002; Zigler & Glick, 1988). Empirical research found a relationship between unpleasant emotions and persecutory delusions such as depression, fear, worry, and anger (Freeman & Garety, 1999; Kennedy, Kemp, & Dyer, 1992). Studies found a relation between suspiciousness (paranoia, less than delusional severity), and unpleasant emotions, and reacted as general unhappiness, depression, anger, and social anxiety among hearing loss (Martin & Penn, 2001; Rawlings & Freeman, 1996).

Individuals who have disturbed emotions tended to report higher levels of suspiciousness which may contribute to the development of suspiciousness/paranoia. Research suggests that women may have higher levels of paranoia (Ciarrochi, Hynes, & Crittenden, 2005; Lindholm, Lehtinen, Hyyppa, & Puukka, 1990). Some research is not consistent and contradicts the earlier findings that men have higher levels of suspiciousness and paranoia (American Psychiatric Association, 1994; Millon & Davis, 1996; Sperry, 1996; von Gemmingen, Sullivan, & Pomerantz, 2003). The prevalence of paranoid ideation was 1.0% among women; more common in 70-year-olds at 2.6% than in 78-82-year-olds at 0.6% (Sigström et al, 2009), and paranoid thoughts ranged from 1.5% to 18.6% in the general population (Freeman et al., 2011).

Sociodemographic variables collectively explained the prevalence of paranoia ideation at 2.39% (Ellett et al., 2022) that lower age; low income and being male are the significant predictor of paranoia. Previous research studies also demonstrated that

men have a higher level of paranoia (Freeman et al., 2011); general paranoia is associated with the urban dwelling (Ellett, Freeman, & Garety, 2008; van Os, 2004), and is associated with lower socio-economic status and migrant status (Freeman et al., 2011).

The prevalence of paranoid thinking ranged from 18.6% to 1.8%, associated with youth, lower intellectual functioning, poverty, poor physical health, poor social functioning, less perceived social support, stress, less social cohesion, unhappiness, with psychiatric symptoms (anxiety, worry, phobias, post-traumatic stress and insomnia), cannabis use, and increased use of treatment or services (Freeman et al., 2011).

Psychoticism: Hearing impairments are recognized apparently as one of the factors in the development of psychosis (Memon et al., 2017). The presence of paranoia and persecutory delusions in patients with hearing-impaired individuals was first identified by Kraepelin in 1905 (Kraepelin, 1914). It is a psychotic phenomenon that the persecutor is having the intention to cause harm to self (Freeman et al., 2000) due to sensory deprivation (Leff, 1968; Daniel et al., 2014), social differentiation (Hoffman, 2007), misinterpretation of communication (Arlinger, 2003; Linszen et al., 2016), and longer duration of hearing impairment causing a stronger risk (Van-der-Werf et al., 2011). Research evinced a significantly higher level of paranoid psychosis in conductive hearing loss than in affective hearing loss (Cooper et al., 1974).

Grinker and colleagues (1969) examined the mental health of deaf individuals in the Chicago area, and the finding showed that 43% were having psychotic disorders, 27% of those were diagnosed with schizophrenia, and 8.2% were with paranoid reactions, autism, paranoid state, and psychotic depressive reaction. Research suggests that hearing impairment is negatively associated with the mental health and quality of life of adults (Nordvik et al., 2018). Hearing impairment has been associated with psychotic symptoms even in the general population (Moreno et al., 2008; Thewissen et al., 2005; van der Werf et al., 2010) and with

paranoid behaviour, especially more in the elderly (Almeida et al., 1995). Hearing impairment is one of the predictors of the onset of psychotic symptoms in both young and older adults (van der Werf et al., 2011). A person suffering from hearing impairment at four years of age is at a higher risk of schizophrenia (Fors et al., 2013), and the prevalence of schizophrenia was higher among severe hearing loss (David et al., 1995). Hearing impairment prompts the onset of paranoid psychosis (Cooper, 1976; Prager & Jeste, 1993). There were significant gender differences in somatization, anxiety, and depression (González de Rivera et al., 2002), and women obtained higher scores than men (Abuín & Rivera, 2014). Other researchers could not find gender differences in paranoia ideation, and women scored higher than men in somatization, depression, and anxiety (Abuín y et al., 2015).

It was observed an increased prevalence of depression and anxiety in people with hearing loss (Theunissen et al., 2014). The Lancet review reports that complex mental conditions such as depression, anxiety, paranoid ideation and interpersonal sensitivity are substantially higher among older people with hearing loss than among normal hearing (Johannes et al., 2012). Some research findings mentioned that hearing loss in high-income countries was more vulnerable to emotional and social loneliness (Pronk et al., 2014), poor cognitive function (Jayakody et al., 2018), depressive symptoms (Sophia et al., 2015), anxiety symptoms (Gomaa et al., 2014) and other psychiatric conditions (Cole et al., 2002). Children with hearing loss have a higher prevalence of depression, oppositional defiant disorder, anxiety and psychological distress (Kvam et al., 2007) and the risks may be magnified by a lack of hearing services or trained staff, little awareness about the management of hearing loss (Eide et al., 2015), higher levels of poverty, inequality and unemployment (Adigun et al., 2017).

Hearing loss effect on psychological function has been described as an unseen handicap with an enormous effect on self-esteem, communication, and everyday activities resulting in loneliness, depression, distress, anxiety, somatization, and decreased social functions (Nachtegaal et al., 2009).

Psychological wellbeing:

The psychological and physical well-being of hearing-impaired children is less favourable, less confident, and less assertive (Annerose et al., 2007). Clausen (2003) found that more mental health problems among hard-of-hearing adults than in the general population and a greater degree of hearing loss with more experience with mental health problems.

Research findings provided that there is a significant relationship between hearing impairment and activity limitations and participation restrictions as hearing levels worsened it leads to increased difficulty in everyday life communication, and increased problems related to involvement in life situations (Hickson et al., 1999; Morgan et al., 2002; Stumer et al., 1996). Hearing impairment negatively influences subjective well-being in older people (Scherer & Frisina, 1998).

Research evinced that a mild to moderate hearing impairment had poorer well-being than normal hearing (Scherer & Frisina (1998) whereas other researchers did not find a relationship between hearing impairment and well-being (Helvik et al., 2006). Several studies demonstrated that children attending schools for the deaf showed a higher risk of mental health problems than children attending mainstream schools (Huber et al., 2015b; Schertz et al., 2016; Theunissen et al., 2014; Van Eldik 2005;), with more anxious, sadder, less confident, and less assertive than their peers in mainstream schools (Keilmann et al., 2007), and decreasing self-confidence with age among hearing-impaired children in mainstream schools but not among children in special schools.

Hearing impairment results in low self-confidence, low self-esteem and lower quality of life (Keilmann, Limberger, & Mann, 2007) based on the degree of hearing impairment, onset age, and the child's intellectual potential which affect individuals' lives to varying degrees (Patton, 2004). Deaf and hard-of-hearing children are more prone to have low self-esteem, feel lonelier, more withdrawn, and less social (Keilmann, Limberger, & Mann, 2007) as it reduces the quality of life and social activities associated with rejection and withdrawal (Masoume, Mohammad, &

Seyede, 2013). A child who lost their hearing at 3 years of age or more may experience a lower quality of life than those who have lost hearing in the early months of life (Glass & Elliot, 1995). Hearing-disabled children showed more internalizing and externalizing symptoms when compared with their normal-hearing counterparts (King et al., 1989; Van Eldik et al., 2004; Fellingner et al., 2012; Theunissen et al., 2011, 2012, 2013, 2014); both can have detrimental consequences on academic and psychosocial functioning in later life and at the risk factors for other psychiatric disorders and substance abuse (Hinshaw 1992; Masten et al., 2005). Hearing loss affected not only the patients but also their families and society with higher mental health care costs and high school dropout rates (Reef, 2010).

The prevalence rates of internalizing disorders in children who are hearing disabled are approximately 27% and that of externalizing disorders is 18%. These rates are based on both clinical interviews and medical records (van Gent et al., 2007; Fellingner et al., 2009b). However, the negative effects on children with hearing loss can be reduced by providing adequate language and communication skills resulting in lower levels of psychopathology (Barker et al., 2009; Fellingner et al., 2009a; Percy-Smith et al., 2008; Stevenson et al., 2010; van Eldik et al., 2004).

A study reported that urban and rural adults differed significantly in well-being not differ on any of the dimensions of psychological well-being except autonomy of the dimensions of psychological well-being (Nepomuceno et al., 2015). Research evinced that a mild to moderate hearing impairment had poorer well-being than normal hearing (Scherer & Frisina, 1998) whereas other researchers did not find a relationship between hearing impairment and well-being (Helvik et al., 2006). Several studies demonstrated that deaf showed a higher risk of mental health problems than mainstream schools (Huber et al., 2015b; Schertz et al., 2016; Theunissen et al., 2014; Van Eldik 2005), with more anxious, sadder, less confident, and less assertive than their peers in mainstream schools (Keilmann et al., 2007), and decreasing self-confidence with age among hearing-impaired children in mainstream schools but not among children in special schools.

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Deaf individuals experienced more severe and chronic life experiences in different forms like the inability to communicate with or participate in family conversations, being deprived of access to information, and linguistic neglect can potentially contribute to an earlier manifestation of mental health problems and reduced quality of life outcomes (Hall, Levin, & Anderson, 2017; Humphries et al., 2016; Kushalnagar, Bruce, Sutton, & Leigh, 2017).

Psychological distress is a predictor of subjective well-being among older adults with hearing impairment (Niazi et al., 2020) that hearing loss cuts off the person from other people in society; communication problems lead to withdrawal from social interactions, feeling of being excluded, poor quality of life and loneliness that gave a feeling of depression and psychological distress (Iwagami et al., 2019) with negative influence on the mental health and well-being (Mumtaz & Saqulain, 2020).

Experiencing more psychological distress decreased overall quality of life (Pavot & Diener, 2009). Loneliness and depressive symptoms predicted a poor physical and mental health-related quality of life among people with hearing loss (Dean et al., 2017). Psychological distress, age and severity of hearing loss were predictors of suicidal ideation and reverse results were for psychological well-being (Akram et al., 2018).

Hearing loss has a negative influence on their daily life activities, social activities and emotional state but these individuals may not develop the symptoms of clinical depression and anxiety if under proper social support (Chen & Most, 2009) while moderate and greater hearing impairment has more chances of getting depressive symptoms (Contrera et al., 2015) and cultural differences can influence the relationship between hearing impairment and mental health.

Self-acceptance: Self-acceptance begins with learning to accept self for being with own unique blend of strengths and weaknesses, history and experience, good and bad, and thoughts and feelings. Rosenberg (1965) defined self-esteem as the degree to which persons accept and value them and, as such, give them a basic feeling of self-worth. Ellis (1995) viewed an individual's self-acceptance as the cornerstone of psychological well-being. Self-acceptance is accepting oneself as a fallible human being, and the ability to fully and unconditionally accept oneself whether or not one behaves correctly and whether other people approve of him/her (Ellis 1977). Studies found that lower levels of unconditional self-acceptance are associated with higher levels of depression (Flett et al., 2003), depression and anxiety (Chamberlain & Haaga, 2001a, b).

Subjective well-being is an evaluation of life cognitively and emotionally as a whole which includes cognitive judgments concerning life satisfaction and emotional reactions to life events in a positive or negative direction (Diener, 2000). Hearing loss is a risk to mental well-being and overall quality of life that leads to poor mental health and declining psychological well-being (Dean et al., 2017). The literature

evinced higher well-being was significantly linked to decreased mental distress and social isolation in hearing-impaired adults (Akram et al., 2018). Psychological distress predicted lower subjective well-being among older adults with hearing impairment. Research demonstrated that men scored higher than women in self-acceptance (Matud et al., 2019).

Acceptance: Acceptance is a process of actively taking in thoughts, memories, feelings and bodily sensations that require emotional and behavioural adaptations (Wentzel et al., 1997), and a key component to adjusting to a disabling condition (Li et al., 1998), psychological distress or well-being (Karekla & Panayiotou, 2011). Acceptance term is used to refer to help-seeking behaviour and intervention (hearing aids) adoption. Research has indicated the utility of psychological acceptance concerning reduced chronic health conditions (McCracken & Vowles, 2006; Westin et al., 2006). Several studies found that greater acceptance is related to psychological well-being (Ruiz et al., 2010).

Studies on psychological well-being manifest that the hearing impaired scored lower in self-acceptance than normal hearing (Keilmann et al., 2007; Matud et al., 2019), other studies confirmed that men scored higher than women in self-acceptance (Matud et al., 2019), and about 58 % of urban adults and 71.77 % of rural adults had a high level of positive relations which shows that rural samples have better relations than urban samples (Devaramane & Yenagi, 2019). An almost equal percentage of urban adults (50.66% and 48.99%) exhibited a medium and high level of self-acceptance, about 63 % of rural adults had high self-acceptance but rural is a bit higher on self-acceptance than rural samples (Devaramane & Yenagi, 2019).

On overall psychological well-being, it was found that about 53 % of urban adults had a medium level of psychological well-being and 54 % of rural adults had high levels of psychological well-being, nearly 47 % of urban adults had a high level of psychological well-being and 46.11 % of the rural adults had a medium level of psychological well-being (Devaramane & Yenagi, 2019).

Socioeconomic status was significantly and positively related to autonomy and self-acceptance (Devaramane & Yenagi, 2019), supported by Vera-villarroel and colleagues (2015) who reported that socioeconomic status and autonomy are positively related. Reshma and Manjula (2016) found that adults belonging to high socio-economic status groups have significantly higher levels of self-acceptance but other independent variables like age, occupation, composition and income were not related to any of the dimensions of psychological well-being and also with overall psychological well-being. These results are on par with the results of Vera-Villarroel and colleagues (2015) who found that the higher the level of occupation better the level of psychological well-being; and a negative, non-significant relation was found between age and other dimensions of psychological well-being like autonomy, environmental mastery, personal growth, positive relations, and self-acceptance.

Among rural young adults, age has a negative significant relationship to self-acceptance, and education has a positive significant relationship with purpose in life and self-acceptance, the size of family and purpose in life (Springer et al., 2011). The results are on par with earlier findings (Moe, 2012; Ibitoye & Sanuade, 2014) who reported that education had a positive relationship with psychological well-being. Among urban middle adults, income has a positive significant relation to positive relations and purpose in life (Devaramane & Yenagi, 2019). Socio-economic status has a positive significant relation to purpose in life among rural middle adults (Kaplan et al., 2008). A higher level of income and socio-economic status promotes positive relations and personal growth (Devaramane & Yenagi, 2019).

Positive relations: Social anxiety disorder is due to negative judgment from another person which leads to confusion (Sobic, Gieler, & Stangier, 2008), and the prevalence of social anxiety is one of the three most common psychiatric disorders (Moitra, Herbert, & Forman, 2008). Social anxiety arises as more problems are faced with adult expectations (Charmaraman, Chan, Chen, Richer & Ramanudom, 2018) and can significantly impair the quality of life and psychosocial functioning. Emotion is a biological response to situations coupled with the response to environmental events (Olatunji, Cisler, & Tolin, 2007). Emotion regulation controls

evaluate and modify one's emotional reactions in the pursuit of goals (Thompson, 1994) as well as prevents negative emotions and maladaptive behaviours (Olatunji et al., 2007).

Hearing-loss individuals are unable properly manage their emotions in the face of everyday events and exhibit diagnostic symptoms and internalized disorders including depression and anxiety (Mennin & Farach, 2007). People facing problems in communication with others make themselves withdraw from social interactions with a feeling of being excluded and it could lead to poor quality of life and loneliness resulting in depression and psychological distress (Iwagami et al., 2019). People with hearing impairment are at more risk of adjustment difficulty in social situations and are susceptible to experiencing disability difficulty in facing environmental hazards. All the above-mentioned mentioned factors have a significant negative influence on mental health and well-being (Mumtaz & Saqulain, 2020).

Hearing loss is positively associated with psychological distress and a decreased overall quality of life (Pavot & Diener, 2009). Loneliness and depressive symptoms were the significant predictors of poor physical and mental health hampering the quality of life among hearing loss (Dean et al., 2017), and gender differences in psychological well-being were documented in earlier research (Weisel et al., 2005; Mejstad et al., 2009). Research evinced that women score higher than men in positive relations with others (Karasawa et al., 2011; Matud et al., 2019). About 61 per cent of urban adults and 68 % of rural adults had a high level of positive relations whereas the rural sample had a higher score than the urban sample on positive relations (Devaramane & Yenagi, 2019).

Autonomy: Hearing loss with higher autonomous motivation scores wanted hearing aids more and reported greater hearing difficulty in everyday life than those with lower scores (De-Juanas et al., 2020). Participants with higher controlled motivation scores were more often referred to the service by others and wanted hearing aids more than those with lower controlled motivation scores. Controlled motivation scores were not associated with perceptions of hearing difficulty in everyday life (Ridgway et al., 2017). In this context, autonomy is seen as one of the dimensions

that constitute psychological well-being (Ryff, 1989) and is considered an integral construct of well-being that describes people's positive functioning to maintain their individuality in different contexts and situations. The study of an individual's ability to make decisions which are independent of external influences (Garberoglio et al., 2017).

Studies show that the older a person the greater degree of autonomy (Barbosa & Wagner, 2015). The desire for autonomy increases during adolescence regardless of gender (Alonso-Stuyck & Aliaga, 2017). Studies highlighted the importance of autonomy to have a better understanding of life cycle development processes and assuming responsibility in life for own well-being (Davies et al., 2015; Li and Hein, 2019).

Earlier studies had already documented correlations between psychological well-being and autonomy, conceiving both concepts as independent processes. Thus, studies provided (Rivas et al., 2012; Romero et al. (2013) psychological well-being correlated with perceived autonomy, taking into account two dimensions: choice and volitional intention. Both studies found that the greater the perceived autonomy, the greater the level of well-being, except for the volitional dimension of autonomy. In turn, other studies also determined that increased levels of autonomy are associated with higher levels of well-being (De Leersnyder & Kim, 2015; Ratelle et al., 2013; Weiting, 2014).

Individuals who are clear about their life goals and objectives can control better their environment appropriate to their needs, and also better in organizing to make better decisions with more autonomy (Valle et al., 2011). Psychological Well-being is related to the relationships established by individuals in public domains (Valle et al., 2019). The majority of the urban (82.22%) and rural adults (77.22) exhibited a medium level of autonomy (Devaramane & Yenagi, 2019). Research showed males and females differ in the dimensions of positive relations with others, personal growth, and autonomy as the female sample obtained the highest scores (García-Castilla et al., 2020). However, the other research findings showed that men scored higher than women in autonomy (Matud et al., 2019).

Environmental mastery: The hearing-impaired face barriers which harm emotional and psychological development. Individuals with hearing impairment have communication problems and are not able to make a normal person understand which affects their social, emotional and cognitive development resulting in psychological well-being levels (Silveswre et al., 2007). Hearing-impaired is different from normal hearing in terms of communication with others which affects their own emotions (Ryff, et al., 2022). About 62 % of the urban adults and 52 % of rural adults had a medium level of environmental mastery which shows that urban scored higher than rural samples (Devaramane & Yenagi, 2019).

Purpose in life: A sense of purpose in life is a critical aspect of psychological well-being. Purpose in life is associated with better performance on cognitive tasks (Merten et al., 2020), greater physical activity (Sutin et al., 2021), and a lower risk of depression (Wood & Joseph, 2010). Psychological well-being has a positive relationship with better hearing (Ryff et al., 2022).

Psychological well-being (PWB) has received growing interest and is a multifaceted concept consisting of eudaimonic (purpose, fulfilment) and hedonic (feeling good) components. Having a purpose in life is associated with mental and physical health (Ryff, 2014; Windsor et al., 2015). Purpose in life is a self-organizing life aim which provides a sense of meaning stimulates goals and manages behaviours (McKnight & Kashdan, 2009).

Personal growth: Hearing impairment is substantially associated with disability, increased risk of incident morbidity, poor self-perceived health (Ejaz et al., 2020), poor psychological well-being, low levels of self-efficacy and happiness (Contrera et al., 2016); also with psychopathological problems like anxiety, cognitive decline and lower health-related quality of life (Mehboob et al., 2019).

Older adults of the hearing impaired were more vulnerable to mental health problems like depression, decreased well-being, emotional sensitivity and aggression (Cosh et al., 2019). Hearing loss thwarts the person from exposure to socially

challenging circumstances which results in isolation with significant impinges on their quality of life and mental health (Mumtaz et al., 2020). Women scored higher than men in personal growth and positive relations with others (Matud et al., 2019), and other research findings validated that women scored higher than men in personal growth (Karasawa et al., 2011). In personal growth, about 54 % of the urban adults and 71 % of rural adults had a high level of personal growth which confirms rural samples have better personal growth than urban samples (Devaramane & Yenagi, 2019).

Hearing Loss in Rural and Urban Areas

In a clinical-audiological study of 6,674 children in 24 tribal villages in the hills of Manipur in a total population of 18,565, the incidence of deafness is found to be 6.62%. The incidence of conductive deafness is 98.64% and that of the sensory-neural is 1.35%. Episodes of cold attacks and running noses are found to be precursors of the prevalent conductive deafness (Das et al., 1999). Mishra and colleagues (1988) in the Patiala area reported a 12.25% incidence of hearing loss among school-going children. Out of this the incidence in the urban school was 8.75% and that in the rural school is 15.8%. A study reported that urban and rural adults differed significantly in well-being, but do not differ on any of the dimensions of psychological well-being except autonomy (Nepomuceno et al., 2015).

It was found that about 53 per cent of urban adults had a medium level of psychological well-being whereas 54 % of rural adults had high levels of psychological well-being; nearly 47 % of urban adults had a high level of psychological well-being and 46.11 % of the rural adults had a medium level of psychological well-being (Devaramane & Yenagi, 2019).

Hearing loss in males and females

Adult women with a greater degree of hearing loss with chronic use of hearing aids have experienced more social isolation (Mick, Kawachi, & Lin, 2014; Mick & Pichora-Fuller, 2016; Weinstein, Sirow, & Moser, 2016) resulting in

loneliness which can lead to depression (Aylaz, Akturk, Erci, Ozturk, & Aslan, 2012). It was found that hearing loss has a significant gender difference in psychological distress as men reflect more symptoms of psychological distress but no significant gender differences in subjective well-being (Yasmeen et al., 2020). Hearing loss was more highly correlated to depressive symptoms in the male population than in females (Shin et al., 2017), and also more in 40 to 50 years old as compared to 60 years of age.

The documentation of hearing disability data based on a self-reporting strategy has limited screening and identification of mild and moderate hearing loss. The National Programme for Prevention and Control of Deafness (NPPCD) try to eliminate preventable deafness, reduce the burden of deafness and empower the hearing-impaired to an economically and socially productive life in 2030 (WHO, 2014). To attain such expectations, it is much required to understand the frequency, type and distribution of hearing loss in the Indian population, and where it is concentrated to frame a strategy for prevention and treatment in a meaningful way. It was estimated that hearing loss affects about 15-26% of the world's population and higher prevalence happens in low-income countries (Béria et al., 2007; WHO, 2011); and deafness is associated with cognitive, social, and emotional development (Kral & O'Donoghue, 2010).

The prevalence of hearing loss among school children was also reported at 12.25% incidence of hearing loss in the Patiala district in India, the difference between urban and rural school children was 8.75% for urban areas and 15.8% for rural children which showed that rural children have a higher rate of hearing loss regardless of the type, level, time of onset, causes, and onset difference.

Studies among rural areas using audiometric evaluation showed the level of prevalence as 11.9% (Jacob et al., 1997) whereas 11% in urban areas (Kalpana & Chamyal, 1997), and 6.62% in tribal populations (Das et al., 1999), and contradictory finding recorded that rural areas have a significantly higher loss about 32.8% whereas urban areas at 6.3% and further information mentioned that 0.58 per 1000 are severe to profound (Chakrabarti & Ghosh, 2019).

Despite India's improving health service, hearing disability remains a major contributor to the loss of personal potential and a financial strain for the individual which contributes to the national well-being of the country; large-scale initiatives may be implemented to identify the degree type in rural and remote areas in the country, and the prevalence can be monitored through social awareness campaigns, widespread neonatal screening, strengthening treatment facilities and well-funded rehabilitation programmes for prevention and treatment in encountering the rising prevalence of hearing impairment (Verma et al., 2021). The availability and frequency of medical interventions, variations in access to deaf education, societal attitudes, and opportunities for deaf people which is responsible for making a difference are the common problems which need the attention of the government authorities for the all-around betterment of the hearing-loss population. However, many of these studies did not employ sufficient representative samples to make concrete conclusions for generalizing the hearing-loss population. For this vulnerable group of hearing loss, knowing which region, group, and individuals are more at risk is much required for designing urgent and appropriate support. Additionally, recognizing and comprehending the factors contributing to psychopathology and psychological well being will enhance the development of screening, intervention, and psychological counseling for individuals with targeted hearing loss and their caregivers (Cosetti & Waltzman, 2012).

More than 90% of deaf and hard-of-hearing children are born into families who are unaware of the difficulties faced by deaf and hard-of-hearing children, their capacity for communication, or their ability to gather information from their surroundings (Mitchell & Karchmer, 2004; Moores, 2001). The hearing loss of many deaf and hard-of-hearing infants was not discovered until they were between the ages of two and three before the advent of newborn hearing screening (Anderssen, Andresen, Andersen, & Sponheim, 2002), and as a result, their language development was slowed down or impeded (Vaccari & Marschark, 1997).

An even larger percentage of the population suffers from milder degrees of hearing loss and unilateral (one-sided) hearing loss (<https://nhm.gov.in>). In a clinical-audiological study of 6,674 children in 24 tribal villages in the hills of Manipur state

of India with a total population of 18,565, the incidence of deafness is found to be 6.62%. More so, the incidence of conductive deafness was at 98.64%, and sensorineural was at 1.35% among the hearing loss in this state (Das et al., 1999).

It may be mentioned that utmost action is required to curtail the growing number of people with hearing loss to improve their quality of life (Wilson et al., 2017) while the progress is still limited and much slower in low- and middle-income countries due to insufficient local capacity to scale up interventions at all levels of health-care delivery coupled with the shortcoming of global initiative and funding support for hearing health care. The screening of hearing loss at birth is available in most high-income countries but in low and middle-income countries it may be not treated as necessary and is still not available. So, it is much-needed low-cost hearing technology for early detection and rehabilitation of people with a hearing impairment which can outweigh their overall long-term economic benefits in society (Huddle et al., 2017).

Considering all the previous studies on hearing loss, it is suggested that an investigation into the Mental Health Problems and psychological well-being of hearing-loss individuals in the target population might help lessen the level of psychological symptoms. It is very crucial to improve public understanding of this disease and its pathophysiology in an attempt to minimize its progression. Furthermore, it is of great importance to hearing rehabilitation services and learning coping strategies that can have a positive impact on the quality of life of individuals with hearing loss.

Objectives of the study:

The study aims to have an in-depth study of the people living with hearing disability by comparing them with normal hearing persons and also to look at any ecological differences among the targeted population. The following objectives were framed for the present study

- 1) To examine the significant difference between Hearing disabled and Normal hearing ability samples on Mental Health Problems and psychological well-being.
- 2) To examine the significant difference between Rural hearing- disabled samples and urban hearing- disabled samples on Mental Health Problems and psychological well-being.
- 3) To examine the significant difference between Female hearing disabled and Male hearing disabled samples on Mental Health Problems and psychological well-being.
- 4) To examine the significant relationship between Mental Health Problems and psychological well-being among the samples.
- 5) To examine the significant independent effect of 'hearing disability', 'ecology' and 'gender' on Mental Health Problems and psychological well-being.
- 6) To examine any significant interaction effect of 'hearing disability and ecology', 'hearing disability and gender', 'ecology and gender' and 'hearing disability and ecology and gender' on Mental Health Problems and psychological wellbeing.

Hypotheses of the study:

The present study has set-forth alternative hypotheses based on the objectives of the study, which are:

- 1) Hearing- disabled samples will score higher on Mental Health Problems and will score lower on psychological well-being than normal hearing samples.

- 2) Urban hearing- disabled samples will score higher on Mental Health Problems but score lower on psychological well-being than Rural hearing-impaired samples.
- 3) Female hearing- disabled samples will have higher scores on psychopathological symptoms but lower scores on psychological well-being than Male hearing-disabled samples.
- 4) The psychological problem will have a significant negative relationship with Psychological well-being.
- 5) 'Hearing disability, 'Ecology', and 'Gender' will have a significant independent effect on Mental Health Problems and psychological well-being.
- 6) The 'Hearing disability x Ecology', 'Hearing disability x Gender', 'Ecology x Gender' and 'Hearing disability x Ecology x Gender' will have significant interaction effects on Mental Health Problems and psychological well-being.

The Methods and Procedure of the present study will be presented in the next chapter: **Chapter IV: Methods and Procedure.**

CHAPTER- IV: METHODS AND PROCEDURES

Samples:

To meet the objectives of the study set forth, an attempt was made to get the identified hearing Loss/hearing impaired from the registered NGOs and Hospitals for the Aimol community run by the government of Manipur State. From the population of the Aimol hearing impaired, 200 samples were drawn randomly which comprises 100 hearing impaired to represent Aimol hearing impaired regardless of type, level of hearing, the onset of hearing, and demographic profiles except for the ecological background, equal representation of ecology (50 rural and 50 urban areas) and gender representation (50 males and 50 females, no transgender were included as a proper record not available).

The hearing-disabled samples were identified by a medical team of the Government of Manipur as well as identified through the assessment of hearing camps done by qualified audiologists using audiometers under registered NGOs of the government of Manipur. To be compared with the hearing impaired /hearing loss samples, 100 Aimol samples having the same distribution of demographic profiles on the ground of age, sex, education, monthly income of the family, size of a sibling, and same locality with hearing impaired samples were selected from the general population who are with normal hearing samples with an equal representation of ecology (50 rural and 50 urban areas) and gender (50 male and 50 female samples) using demographic profiles constructed for the study. This socio-demographic profile was utilized to cross-check the true representation of the subject as laid down in the objectives of the study.

Inclusion criteria for the sample selection:***1) Control group:***

- a) A person from the Aimol community,
- b) who was identified as having hearing disabilities,
- c) age range between 18 to 69 years of age
- d) communicable with verbal or sign language
- e) Only those who give consent for willingness to participate in the study

2) *Experimental group:*

- a) A person belongs to the Aimol community
- b) Who was identified as not having a hearing disability or normal hearing
- c) Age range between 18 to 69 years of age
- d) Communicable with verbal not by sign language
- e) Only those who give consent for willingness to participate in the study

2) *Exclusion criteria for sample selection*

- a) A person does not belong to the Aimol community
- b) Having a severe physical and mental health
- c) Below 19 years and above 69 years
- d) Not belong to female and male or identify themselves as having a third gender category
- e) Not included any who does not give consent for participation in the study

The age range from 18 to 69 years encompasses a significant portion of the adult lifespan, making it an opportune period for studying both hearing and psychology. This age range covers a diverse range of experiences, challenges, and developmental stages. In terms of hearing, it allows researchers to investigate how auditory abilities evolve and potentially decline across adulthood.

During these years, individuals often undergo critical life transitions, such as entering the workforce, forming and maintaining relationships, and potentially experiencing changes in physical and mental health.

Additionally, this age span includes individuals who may be more susceptible to certain psychological and hearing-related issues, such as age-related hearing loss or changes in cognitive functioning. Therefore, research within this age range can offer a comprehensive understanding of the intricate connections between auditory perception and psychological aspects, ultimately contributing to the development of targeted interventions and support systems for individuals in different stages of adulthood.

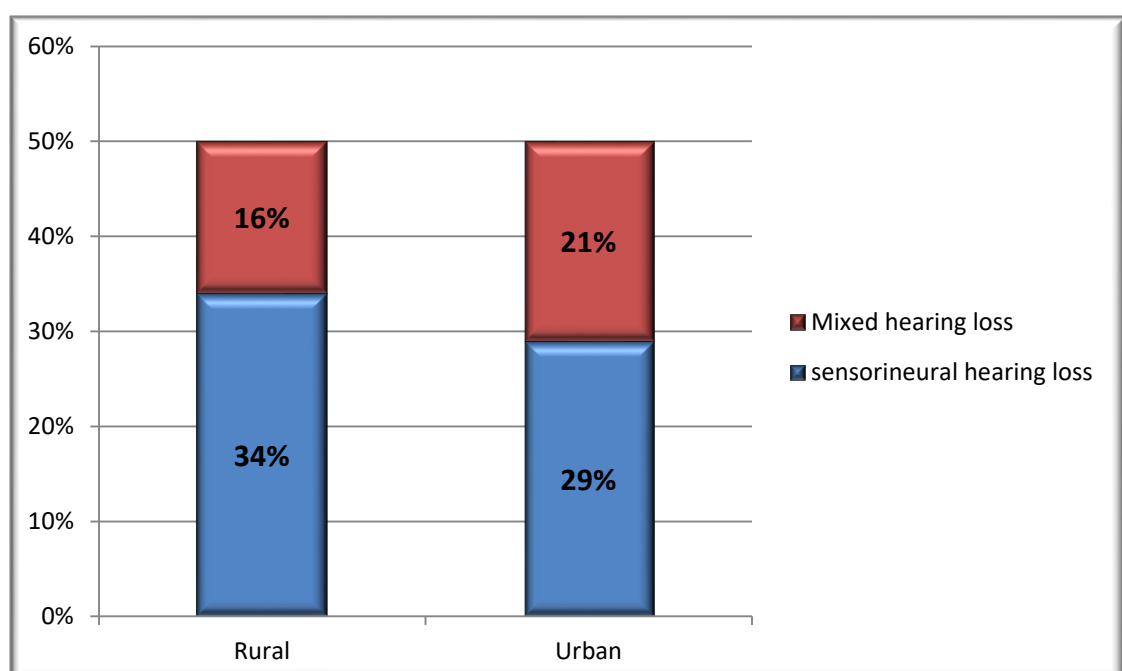
Sample Characteristics

The sample characteristics of the study were an age range from 18 to 69 years as well as a distribution of different age groups (18-28 years =18%; 29-38 years =19%; 39-48 years =20%; 49-58 years =21%; 59-69 years =22%); distribution of education level range between class II to graduate level (below class X=30%; matriculation to graduate BA=33%; graduate; below MA=37%); monthly income distribution is ranged from Rs. 1000 to 3 lakh (below Rs. 5000=38%; 5001-10000=27%; 10001 – 50000=19%; 100001-200000=11%; 200001-above=5%); the size of family range from 3 to 13 family members (below 7 member=44%; 5-8 members=38%; 9-13 members =18%); the size of sibling range from 2- 11 siblings (2-5=49%; 5-8=37%; 9-12=14%) served as the sample.

The sample characteristics of the study can be explained with the help of a diagram as follow:

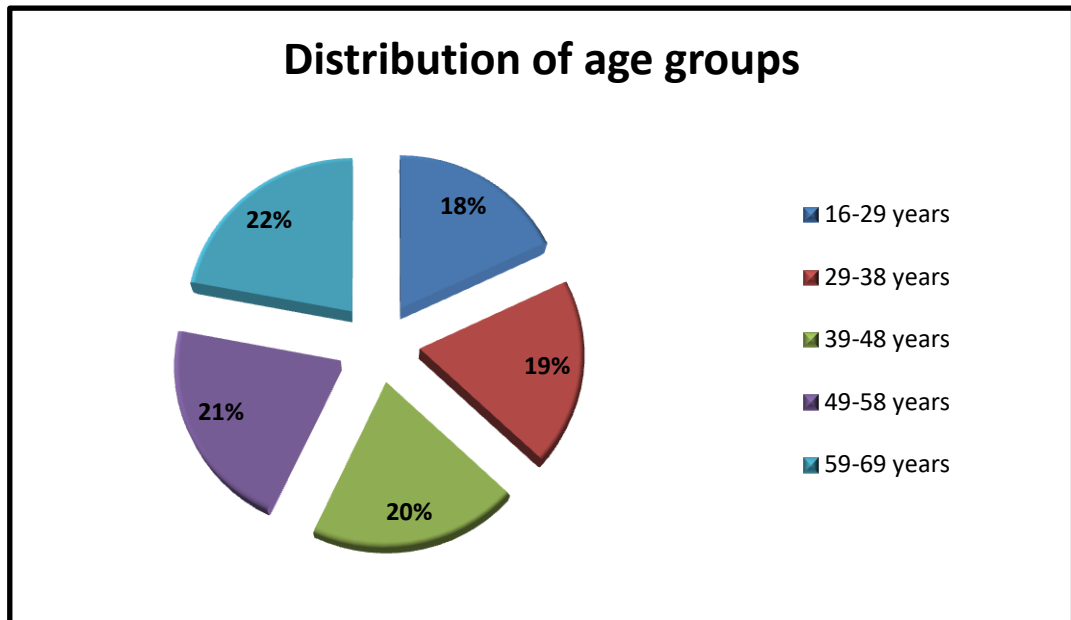
(i) Distribution of the types of hearing disabilities among the sample:

Figure-2: Showing Distribution of two types of hearing disabilities in the sample (Rural & Urban).



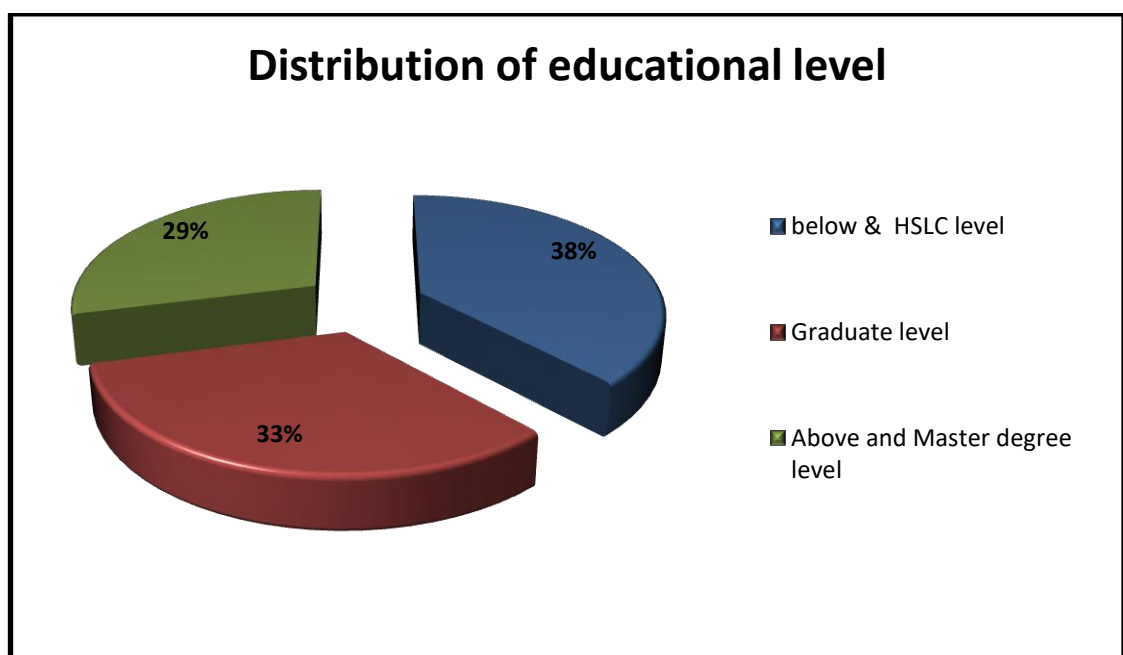
(ii) Distribution of Age group among the sample:

Figure - 3: Showing Distribution of age group in the sample.



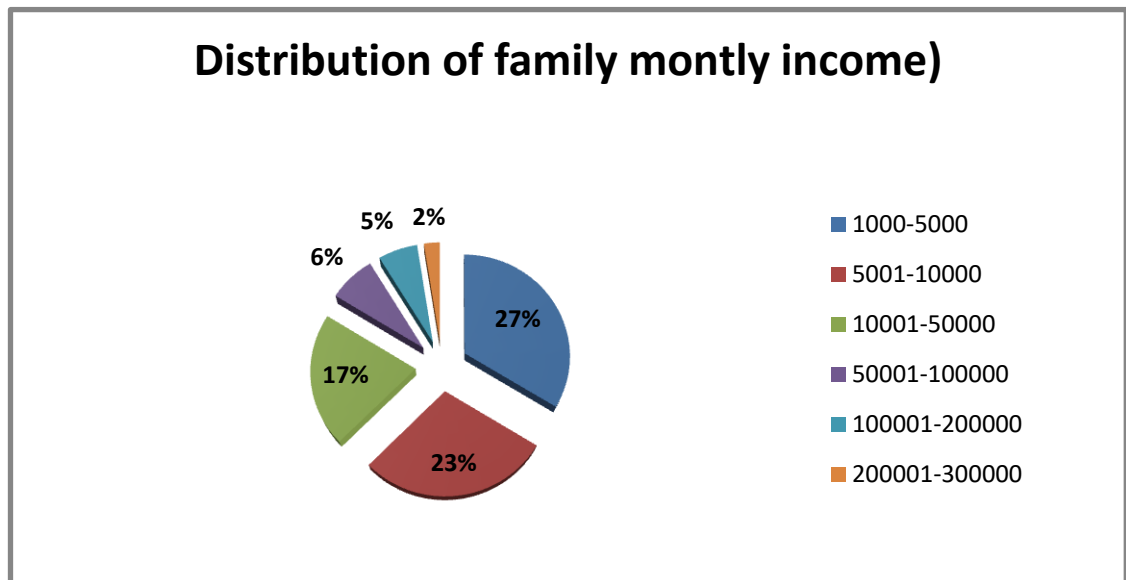
(iii) Distribution of Education Level among the Sample.

Figure 4: Showing Distribution of education level in the sample.



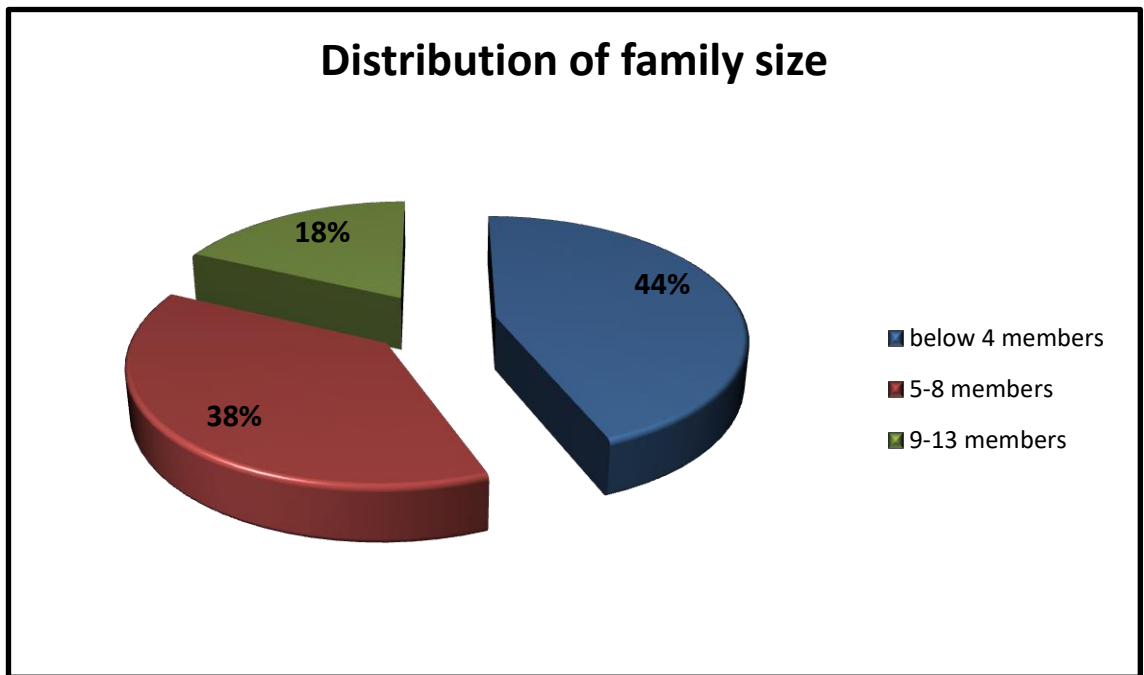
(iv) Distribution of family monthly income

Figure -5: Showing Distribution of family monthly income in the sample.



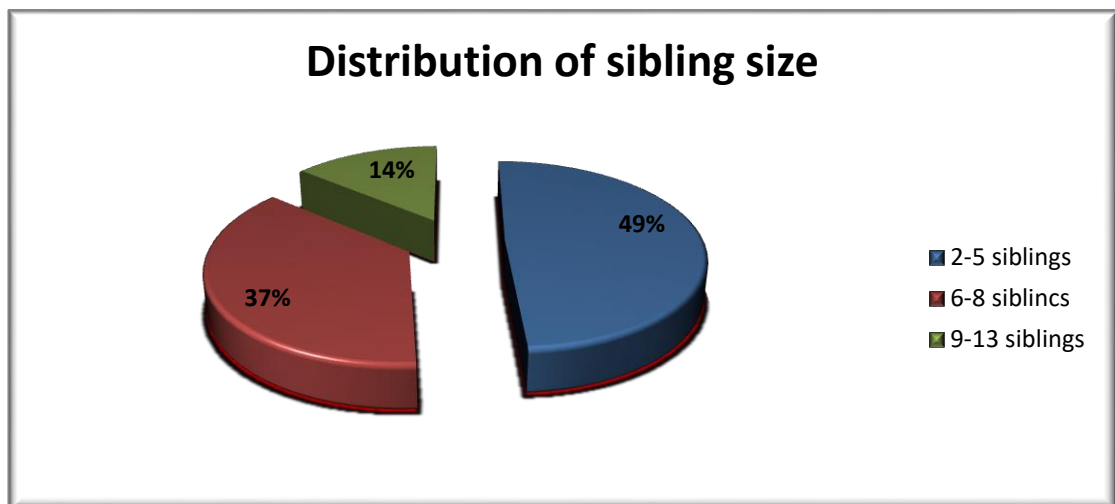
(v) Distribution of family size among the sample:

Figure - 6: Showing Distribution of family size in the sample.



(vi) **Distribution of sibling size:**

Figure-7: Showing distribution of sibling size in the sample.



Psychological measurement used:

The present study used two standardized psychological tests to ascertain the psychological function of the samples, as follows:

1. *The Symptom Checklist 90 Revised (SCL-90-R; Derogatis, 1983)* The Symptom Checklist 90 Revised (SCL-90-R) is a self-report screening to measure general psychiatric symptomatology. It consists of 90 items and has six subscales which measure different dimensions such as somatization, obsessive-compulsive, depression, anxiety, phobic anxiety, anger/hostility, interpersonal sensitivity, paranoid ideation, and psychoticism. Therefore, it is designed for a broad spectrum of populations and can be used to screen psychiatric disorders ranging from non-patient “normal” populations to medical patients with psychiatric disorders, and useful in quantifying a variety of emotional reactions in adults but should not administer to delirious, mentally retarded, and floridly psychotic patients (Derogatis 1983); the psychometric property was checked and found its applicability for the original scale which was α : 0.72 y 0.97 (Derogatis, 2012).

2. *Psychological Well-Being* was assessed using the Scales of Psychological Well-Being (Ryff & Keyes 1995) which conceptualize psychological well-being (PWB) as having the following six subscales:

- (i) Self-acceptance- a positive attitude toward one’s self, life, and past, including good and bad qualities,
- (ii) Positive relations with others - warm, satisfying, trusting relationships,
- (iii) Autonomy - independence, ability to resist social pressures and follow own standards,
- (iv) Environmental mastery- competence in managing life’s demands,
- (v) Purpose in life -goals and direction, sense of meaning,
- (vi) Personal growth - view of self as growing and developing, openness to new experiences.

The PWB scales measured these six elements and are available in several lengths. The 54-item version, with nine items per scale, was used in the present study. This version has been shown to have good psychometric properties (Sewell et al. 2004) with internal consistency ($\alpha > .70$) and life control ($\alpha = .69$). We used a total score derived by summing the elements of well-being. Ryff’s (1989a) original paper revealed that the six scales' internal consistency (α) ranged from .73 to .86.

Further, the reliability of the test was checked over six weeks, and returned coefficients ranging from .88 to .81 confirming it was sufficiently reliable (Ryff, 1989). Psychological well-being (PWB) represents “the achievement of one’s full psychological potential” (Carr, 2004) and is multi-dimensional.

3. *The demographic profiles (Lanu, 20017).* It was constructed by the researcher to know about the details of demographic details of the sample/subject like the type of hearing disability as per the record of the professional, the level or severity of the hearing, the onset of hearing, age, time of onset, gender, family size, family income, size of a sibling, rank in the sibling, any hearing aide used, permanent address, and so on.

Design:

A Correlational design was used to compare between Hearing impaired and Normal hearing, Urban hearing impaired and Rural hearing impaired, and Female hearing impaired and Male hearing impaired on psychopathological symptoms and psychological well-being. A factorial design, 2x 2x2 was also used to find out the independent and interaction effects of ‘Hearing impairment (hearing impaired and normal hearing)’, ‘Ecology (rural and urban hearing impaired)’ and ‘Gender (female and male hearing impaired)’ on psychopathological symptoms and psychological well-being. Psychological study interest in to study the relationship between psychological and non-psychological factors (Lewin, 1943 as cited by Charles & Sommer, 2012) determining to find out how they determine the conditions of life for an individual or group.

Procedure:

Firstly the researcher collected the selected psychological tests and translated them into the Aimol language with due care to the methodological obligation. The pilot study was conducted with 80 Aimol community samples consisting of 40 hearing loss identified by registered NGOs and 40 normal hearing who has equal

demographic profiles with the experimental group- the hearing impaired, and the reliability between the original and translated scale was α : 0.85-0.87 which showed its applicability for the targeted population.

Secondly, the hearing-disabled samples were collected from the list of people living with hearing impairment maintained by the Hospital run by the Manipur Government and Centers run by the Registered NGOs (hearing assessment camps organized) of the Government of Manipur.

Thirdly, the normal samples were collected who are identified as matching the representatives of the people living with hearing impairment on age, sex, ecology, hearing ability and so on to prevent confounding variables.

Fourthly, necessary permission and consent were taken from significant persons (participants, authorities, etc) before conducting the scales on the subjects.

Fifthly, the purpose of the study and necessary instructions given are informed to the subject, any doubts were clarified, and the subject was informed that participation in the study was fully voluntary bases and can leave at any time of their own choice, assurance was given for keeping the confidentiality of any information of the personal details; then after only those who give consent were included for psychological evaluation.

The instruction as per the manual of the tests and Ethical principles of psychologists and Code of conduct (APA, 2002) was followed in the administration of the test. The administration was done in individual conditions where noise disturbance or any other possible distraction was not there. The conduction of the psychological scales was done in the individual condition. All the administration of the psychological test was strictly followed as per the instruction of the prescribed manual for each scale used in the present research study. The scoring was done as per the manual of the test scales.

Statistical Analysis:

Subject-wise scores on items of the Symptom Checklist 90 Revised (SCL-90-R; Derogatis, 1983) and Psychological Well-Being (Ryff and Keyes 1995) were analyzed to work out the psychometric properties of the subscales of the two psychological tests among hearing loss individuals and normal hearing samples.

IBM's Statistical Package for the Social Sciences (SPSS 26) was used for the data analysis.

Firstly, the psychometric adequacy of the two psychological tests was calculated and found Cronbach alpha reliability coefficient (of the subscales and full scales) ranges between (α) .73 to .86 which showed the scale's appropriateness for the collection of data from the targeted population.

Secondly, the mean and SD values, Skewness, Kurtosis, and Levene's tests of homogeneity of variance were employed to ascertain the appropriate statistics between parametric and non-parametric for further analysis. The t-test was employed to find any significant difference between 'Hearing impaired and Normal hearing', 'Urban hearing impaired and Rural hearing impaired, and 'Female hearing impaired and Male hearing impaired' on psychopathological symptoms and psychological well-being

Thirdly, Pearson's Correlation was calculated to find out any significant relationship between the variables for the samples.

Fourthly, 2x2x2 factorial ANOVA was employed just to examine the independent and interaction effects of 'Hearing impairment', 'Ecology', and 'Gender' on the dependent variables.

Results of the study were presented in the next chapter-*Chapter V: Results and Discussion.*

CHAPTER - V: RESULTS AND DISCUSSION

The present study, “Mental Health Problems and psychological well-being of people with hearing disabilities: A study among Aimol tribe of Manipur” as per design, demonstrated the Mental Health Problems and psychological well-being among the hearing disabled of the Aimol tribe along with ecological and gender differences in Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Anger/hostility, Phobic Anxiety, Paranoid Ideation, Psychoticism, self-acceptance, positive relations with, autonomy, environmental mastery, purpose in life, personal growth.

To meet the objectives of the study, 200 Aimol samples comprised of 100 Aimol hearing disabled and 100 Aimol normal hearing with equal representation of ‘hearing disabled’ (Hearing disabled and normal hearing samples), ‘Ecology’ (rural and urban hearing disabled samples), ‘Gender’ (male and female hearing disabled samples), age range between 18 to 69 years of age, selected through random sampling procedure. The hearing-impaired samples were identified by a medical team of the government of Manipur as well as organized assessment of hearing camps by qualified audiologists using audiometers. The normal hearing samples were selected to well-match with the hearing-disabled samples on demographic profiles such as age, sex, education, monthly income of the family, and size of a sibling from the general population.

The Symptom Checklist 90 Revised (SCL-90-R; Derogatis, 1983) was used to measure the Mental Health Problems of the sample *and the Psychological Well-Being Scale (Ryff & Keyes 1995)* was used to measure the psychological well-being of the samples. The Correlational design was used to compare the two levels of hearing disability (Hearing disabled and Normal hearing samples), two levels of ecologies (100 Rural and 100 Urban hearing disabled samples), and two levels of genders (100 Males and 100 Females hearing disabled samples) which initiated eight cells.

The administration of the psychological test was strictly conducted following the instruction given in the test manuals and the Ethical principles of psychologists for research - the Code of Conduct (APA, 2002).

The data collected from the samples were analyzed for a simple and easier understanding of the findings of the study, and the details of the results were presented in the proceedings.

Checking of missing raw data and outlier

To ensure the accuracy of the study results, the raw data were first examined for any potential missing or extreme outlier values. The researcher meticulously reviewed the datasheet to identify any incomplete or missing data, and upon confirming the absence of such outliers, proceeded with the subsequent statistical analysis.

Psychometric adequacy of the Psychological scales

The two psychological tests employed were standardized tests which were originally constructed for other populations, and need to be checked for appropriateness for the targeted population. Though it was done with a pilot study for methodological refinement, the reliability, homogeneity and normality were checked on all the subscales of the two tests to find their applicability for the selected population under study; and found all subclasses showed reliability ranging between $\alpha = .85-.87$ (Aimol, 2018). Psychometric analyses of the scales and subscales were done by using Microsoft Office Excel 2013 and Statistical Package for the Social Sciences (SPSS 20).

Reliability checking for the psychological tests

Results showed the internal consistency of the scales was calculated using Cronbach's coefficient alpha (Cronbach, 1951) and all the scales of the nine subscales of the Symptoms Check List - Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Anger/hostility, Phobic Anxiety,

Paranoid Ideation, and Psychoticism separately and found the reliability ranged from (α) .68 to .83 and put together in Table-1; and also for the six subscales of psychological well-being - Self-acceptance, Positive relations with others, Autonomy, Environmental mastery, Purpose in life, and Personal growth and found the reliability range from (α) .67 to .89 which were showed in the Table-2. Results evinced that the reliabilities of the two tests were trustworthy to the targeted population, and further analysis was done in the study.

Table -1: Showing normality (Mean, SD, Kurtosis, and Skewness), homogeneity, and reliability on subscales of the Psychopathological symptoms/ Mental Health Problems (SCL-90) for the whole samples.

Statistics	Dependent Variables of Mental Health Problems								
	Somatization	OCD	Interpersonal Sensitivity	Depression	Anxiety	Anger/hostility	Phobic Anxiety	Paranoia Ideation	Psychoticism
Mean (μ')	6.03	4.56	3.87	4.48	4.00	2.22	3.23	2.78	3.87
SD (σ)	1.95	0.62	0.41	0.66	0.99	0.24	1.17	0.68	1.31
Kurtosis ($\mu 4$)	-0.59	0.31	0.22	0.18	0.50	0.85	0.15	0.16	0.36
Skewness (Skp)	0.15	0.39	0.60	0.28	0.19	0.14	0.25	0.31	0.81
Homogeneity of Variances	0.34	0.42	0.36	0.41	0.38	0.36	0.43	0.23	0.19
Cronbach's alpha (α)	0.68	0.71	0.82	0.73	0.78	0.81	0.77	0.76	0.83

The internal consistency of the scales was calculated using Cronbach's coefficient alpha (Cronbach, 1951) and all the scales and subscales were found to be reliable as shown in Table -1 that includes Somatization ($\alpha = .68$), Obsessive-Compulsive ($\alpha = .71$), Interpersonal Sensitivity ($\alpha = .82$), Depression ($\alpha = .73$), Anxiety ($\alpha = .78$), Anger/hostility ($\alpha = .81$), Phobic Anxiety ($\alpha = .77$), Paranoid Ideation ($\alpha = .73$), and Psychoticism ($\alpha = .88$); and reliability for the subscales of psychological well-being includes - Self-acceptance ($\alpha = .89$), Positive relations with others ($\alpha = .85$), Autonomy ($\alpha = .84$), Environmental mastery ($\alpha = .79$), Purpose in life ($\alpha = .81$), and Personal Growth ($\alpha = .67$).

The item-total coefficient of correlation and interscale relationships, and reliability coefficients (Cronbach Alpha) over all the levels of analyses ensured the strength of the psychological tool used and the consistency of subject scores which permit parametric statistics may be used for further analysis.

Homogeneity checking for the psychological tests

Levene's Test of Equality of variances tests was employed for checking the homogeneity of variances which is the inferential statistic used to assess the equality of variances for a variable calculated for two or more groups.

Table-1 shows Levene's Test of Equality of variances for each sub-scale of the Mental Health Problems and Psychological well-being showing all the scores were greater than .05, which were non-significant levels and indicating the assumptions of homogeneity of variance were met which suggested that parametric statistics may be employed for further analysis.

Table -2: Showing the normality (Mean, SD, Kurtosis, and Skewness), homogeneity, and reliability on subscales of the Psychological well-being for the whole samples.

Statistics	Dependent Variables of <i>Psychological Well-Being</i>					
	Self-acceptance	Positive relations with	Autonomy	Environmenta l mastery	Purpose in life	Personal growth
Reliability (Cronbach Alpha; α)	.89	.85	.83	.79	.81	.67
Homogeneity of Variances	.54	.51	.32	.09	.06	.05
Mean (' μ ')	26.19	26.77	36.83	25.69	26.59	26.71
SD (σ)	5.92	5.22	5.66	5.26	5.41	5.39
Kurtosis (μ^4)	0.68	0.77	0.61	0.55	0.49	0.40
Skewness (Skp)	0.63	0.28	-0.40	0.5	0.55	0.35

Normality: The descriptive statistics were calculated to examine the normality of the subscales of Mental Health Problems and Psychological well-being for the whole sample. The descriptive statistics consisting of Standard Deviation, Skewness and Kurtosis demonstrated that data were normally distributed as shown in Table -1 for the subscales of the psychopathological symptoms, and in Table-2 for the subscales of the psychological well-being which suggested that parametric statistics may be used for further analysis.

Objective-1: To examine the significant difference between Hearing disabled and Normal Hearing ability samples on Mental Health Problems and psychological well-

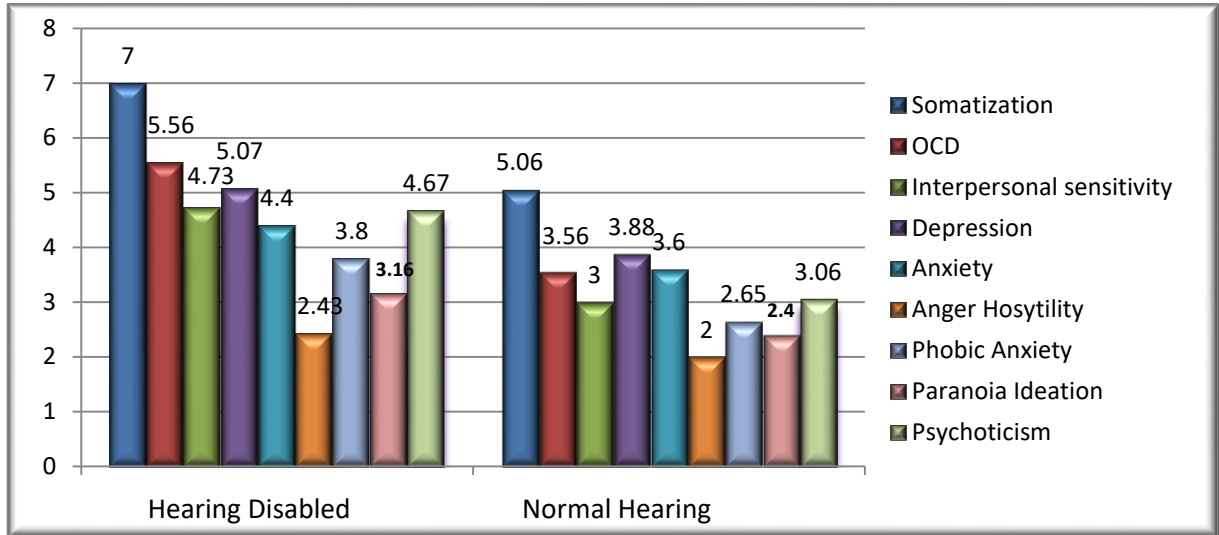
being. An Independent t-test was computed between the two comparison groups (Hearing impaired and Normal Hearing) to meet the first objective and first hypothesis of the study as shown below in Table -3 and Figure-8.

Hearing disabled and Normal Hearing groups on Mental Health Problems

Table -3: Showing Mean, SD, Kurtosis, Skewness and Mean significant difference (t-test) between Hearing Disabled and Normal Hearing on subscales of Mental Health Problems.

Groups	Statistics	Dependent Variables of Mental Health Problems								
		Somatization	OCD	Interpersonal	Depression	Anxiety	Anger/hostility	Phobic Anxiety	Paranoid Ideation	Psychoticism
Hearing Disabled	Mean	7.00	5.56	4.73	5.07	4.40	2.43	3.80	3.16	4.67
	SD	1.58	1.06	1.36	1.22	1.13	0.22	0.55	0.87	1.22
	Kurtosis	0.35	0.77	0.29	0.88	0.68	0.62	0.22	0.23	0.59
	Skewness	0.17	0.34	0.36	0.40	0.41	0.39	0.40	0.45	0.46
Normal Hearing	Mean	5.06	3.56	3.00	3.88	3.60	2.00	2.65	2.40	3.06
	SD	1.79	0.73	0.80	0.58	0.88	0.34	0.49	0.71	0.80
	Kurtosis	0.51	0.45	0.79	0.62	0.20	0.57	0.32	0.56	0.51
	Skewness	0.44	0.29	0.40	0.56	0.53	0.30	0.37	0.28	0.35
t-test between Hearing disabled & NH samples		8.12*	12.31**	9.88*	7.53**	6.25*	1.17	7.96**	6.75**	8.12*

Figure-8: Showing the mean difference between Hearing Disabled and Normal Hearing groups on Mental Health Problems.



(i) Hearing Disabled scored higher than Normal hearing in all Mental Health Problems with significant differences including in Somatization ($M=7.00$; 5.06 ; $t=8.12$; $p<.01$), Obsessive-Compulsive ($M=5.56$; 3.56 ; $t=12.31$; $p<.01$), Interpersonal Sensitivity ($M=4.73$; 3.00 ; $t=9.88$; $p<.01$), Depression ($M=5.07$; 3.88 ; $t=7.53$; $p<.01$), Anxiety ($M=4.40$; 3.60 ; $t=6.21$; $p<.01$), Phobic Anxiety ($M=3.80$; 2.65 ; $t=7.96$; $p<.01$), Paranoid Ideation ($M=3.16$; 2.40 ; $t=6.75$; $p<.01$), and Psychoticism ($M=4.67$; 3.06 ; $t=8.12$; $p<.01$) but not significant in Anger hostility ($M=2.43$; 2.06 ; $t=1.17$; $p<.09$) as shown in Table-3.

Results of the study have supported the *hypothesis-1* as it was expected that Hearing disabled samples will score higher on Mental Health Problems than normal hearing samples; the finding was also in line with the findings of the earlier studies that Hearing Impaired scored higher than normal hearing in somatization (Mehboob et al., 2019; Nachtegaal et al., 2009), have a higher symptom of OCD due to musical obsession triggered by the absence of external acoustic stimuli (Kraemer et al., 2005) as repetitive musical sounds in the absence of an external source (Williamson et al., 2014; Liikkanen et al., 2013), have a higher level of higher levels of interpersonal sensitivity than normal hearing (Baraldi et al., 2007), more symptoms of depression than normally hearing (Theunissen et al., 2011), more signs of anxiety than normal hearing (Shoham, Lewis, Favarato, & Cooper, 2019), have higher levels of hostility

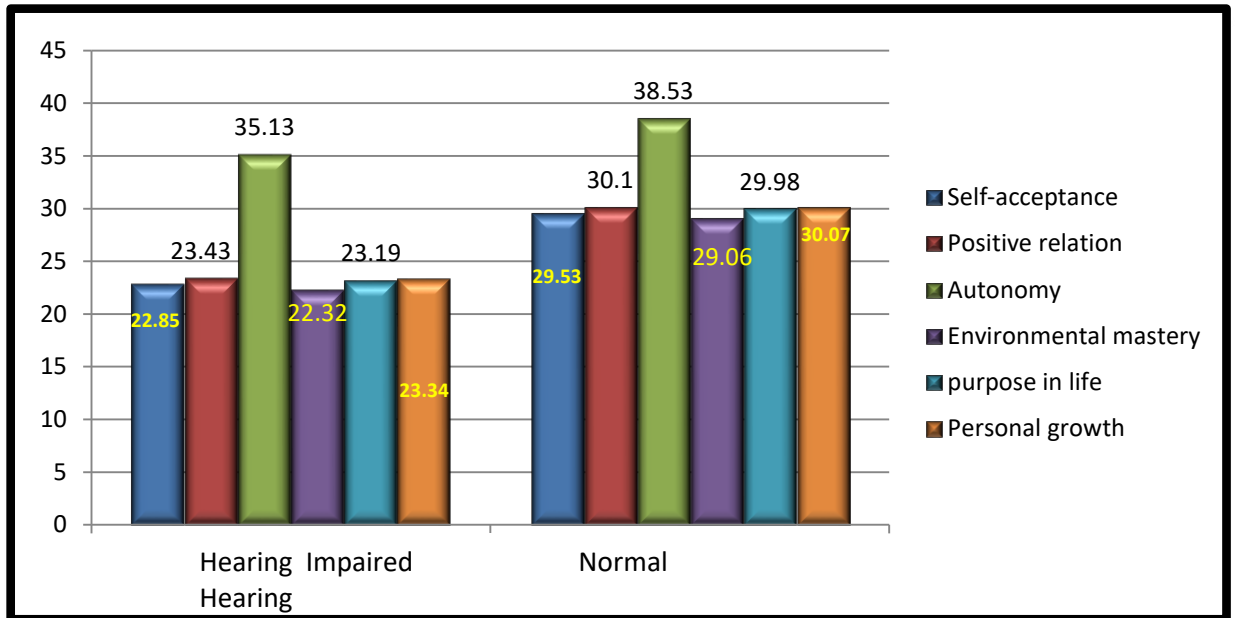
(Baraldi et al., 2007), low social functioning with high phobic anxiety and social phobia, (Eleuteri et al., 2010), higher level of paranoid psychosis (Cooper et al., 1974), and hearing disability predicting psychotic symptoms (van der Werf et al., 2011).

Hearing disabled and Normal Hearing groups on psychological Well-being

Table -4: Showing Mean, SD, Kurtosis, Skewness and Mean significant difference (t-test) between Hearing Disabled and Normal Hearing on subscales of Psychological Well-Being.

Groups	Statistics	Dependent Variables of <i>Psychological Well-Being</i>					
		Self-acceptance	Positive relation with others	Autonomy	Environmental mastery	Purpose in life	Personal growth
Hearing disabled	Mean	22.85	23.43	35.13	22.32	23.19	23.34
	SD	5.03	5.01	1.659	5.14	5.23	5.35
	Kurtosis	0.39	0.80	0.40	0.79	0.68	0.67
	Skewness	0.76	0.10	-0.02	0.07	0.05	0.09
Normal Hearing	Mean	29.53	30.10	38.53	29.06	29.98	30.07
	SD	5.67	5.00	5.67	5.95	5.17	5.04
	Kurtosis	0.17	0.54	0.41	0.61	0.50	0.51
	Skewness	0.63	0.20	0.17	0.16	0.19	0.16
t-test between Hearing disabled and Normal Hearing samples		16.05**	24.63**	1.37	25.00**	23.30**	24.28**

Figure-9: Showing the mean difference between Hearing Disabled and Normal Hearing groups on psychological well-being.



Hearing Disabled and Normal Hearing on Psychological Well-being

The result depicted Normal Hearing scored higher than the Hearing Impaired group in all psychological well-being measures with significant difference levels in Self-acceptance ($M=29.53, 22.85; t=-16.05; p<. 01$), Positive relations with others ($M=30.10; 23.43; t=24.63; p<. 01$), Autonomy ($M=38.53; 35.13; t=1.37; p<. 19$), Environmental Mastery ($M=29.06; 22.32; t=25.00; p<. 01$), Purpose in Life ($M=29.98; 23.19; t=23.30; p<. 01$), and Personal Growth ($M=30.07; 23.34; t=24.28; p<. 01$), and presented in Table-4.

Again the results of the present study evinced that the Hearing Impaired scored lower than the Normal hearing subject on psychological well-being as expected which affirmed the ***hypothesis-1***, and was also in line with the earlier findings that the Hearing Impaired samples had poorer well-being than normal hearing (Scherer & Frisina (1998), lower in self-acceptance than normal hearing (Keilmann et al., 2007(Matud et al., 2019), less impulsive and socially immature (Myklebust, 1996), lower self-esteem (Bat-Chava, 1993), loss of autonomy (Lin et al., 2013), poorer physical functioning (Reuben et al., 1999; Viljanen et al., 2009),

and a higher realization of purpose in life (Springer et al., 2011) whereas some got a contradictory finding as no differences based on hearing status (Kluwin, 1999).

Objective-2: To examine the significant difference between Rural Hearing-disabled samples and Urban Hearing-disabled samples on Mental Health Problems and psychological well-being.

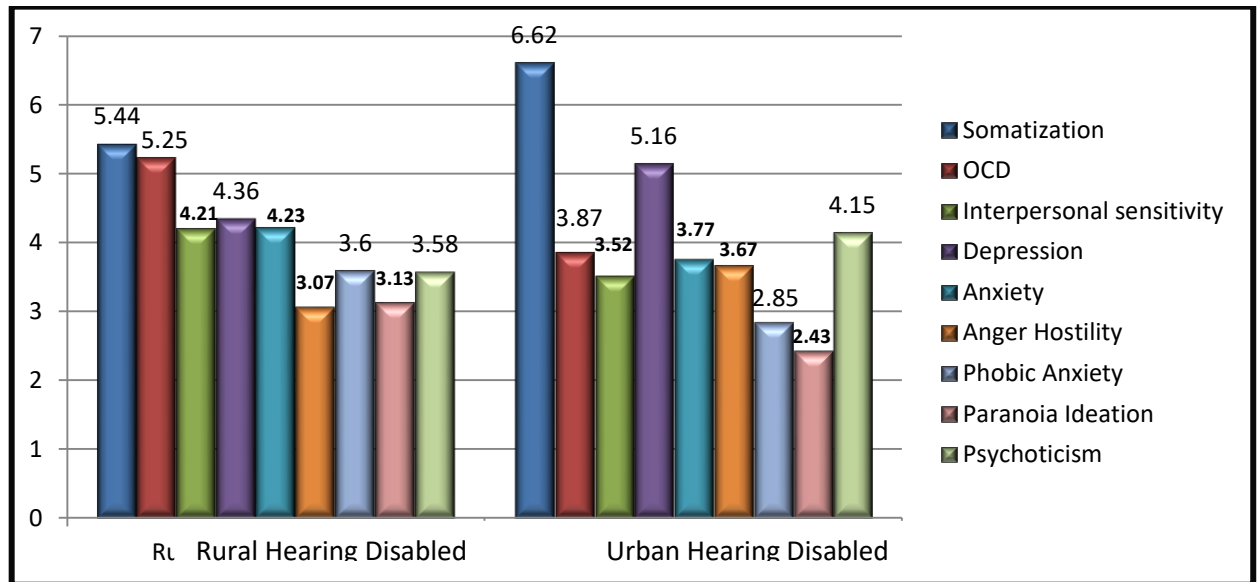
Rural hearing disabled and Urban hearing disabled in Mental Health Problems.

Results of the study provided that the rural hearing-impaired group scored higher than the Urban hearing disabled group with a significant difference in OCD (M=5.25, 3.87; t= 2.64; p<.01), Inter-personal sensitivity (M=4.21, 3.52; t= 2.51; p<.01),

Table-5: Showing Mean, SD, Kurtosis, Skewness and Mean significant difference (t-test) between Rural Hearing-disabled and Urban Hearing disabled samples on Mental Health Problems.

Groups	Statistics	Mental Health Problems								
		Somatization	OCD	Interpersonal Sensitivity	Depression	Anxiety	Anger/hostility	Phobic Anxiety	Paranoid Ideation	Psychoticism
Rural Hearing Impaired	Mean	5.44	5.25	4.21	4.36	4.23	3.07	3.60	3.13	3.58
	SD	1.52	1.13	1.58	1.23	0.99	1.25	1.13	0.77	0.39
	Kurtosis	0.75	-0.54	0.41	0.90	0.66	0.55	0.52	0.44	.49
	Skewness	0.39	0.33	0.42	0.38	0.41	0.45	0.37	0.44	0.66
Urban Hearing Impaired	Mean	6.62	3.87	3.52	5.16	3.77	3.67	2.85	2.43	4.15
	SD	1.69	0.55	0.86	1.22	0.93	0.24	0.30	0.84	1.27
	Kurtosis	0.37	0.29	0.38	0.42	0.40	0.76	0.52	0.14	0.67
	Skewness	0.26	0.22	0.76	0.23	0.09	0.23	0.36	0.58	0.72
t-test between Urban and Rural Hearing-impaired		2.29*	2.64**	2.51*	2.50**	2.29*	1.97	2.15**	2.12**	2.18*

Figure 9: Showing the mean difference between Rural hearing-disabled and Urban Hearing disabled groups on Mental Health Problems.



Anxiety ($M=4.23, 3.77; t= 2.29; p<.01$), Phobic Anxiety ($M=3.60, 2.85; t= 2.15; p<.01$), and Paranoid Ideation ($M=3.13, 2.43; t= 2.12; p<.01$); the rural hearing-impaired group scored lower than Urban hearing impaired samples with a significant level in Somatization ($M=6.62, 5.44; t= 2.29; p<.01$), Depression ($M=5.16, 4.36; t= 2.80; p<.01$), and Psychoticism ($M=4.15, 3.58; t= 2.18; p<.01$) but scored higher but not significant on Anger/hostility ($M=3.67, 3.06; t= 1.97; p<.13$), as displayed in Table-5.

Results of the study accepted the hypothesis-2 as expected that Urban hearing-impaired samples scored higher on Mental Health Problems but score lower on psychological well-being than Rural hearing impaired samples; and also confirmed the earlier findings which found a significant difference between urban residents and rural residents (Swartz et al., 1989), higher anxiety disorders were found in the urban area (Vassos et al., 2016), greater paranoid ideation among rural (Freeman et al., 2011), greater Anger/hostility among the subjects of urban areas than the subject of rural areas (Bisht & Sharma, 2021) may be the poor rural subject are more susceptibility to paranoia due to low socioeconomic status (Mirowsky & Ross, 1983), and gender seems one of the independent significant predictors to

affective psychosis as a higher prevalence of affective disorders found in women (Blazer et al., 1994).

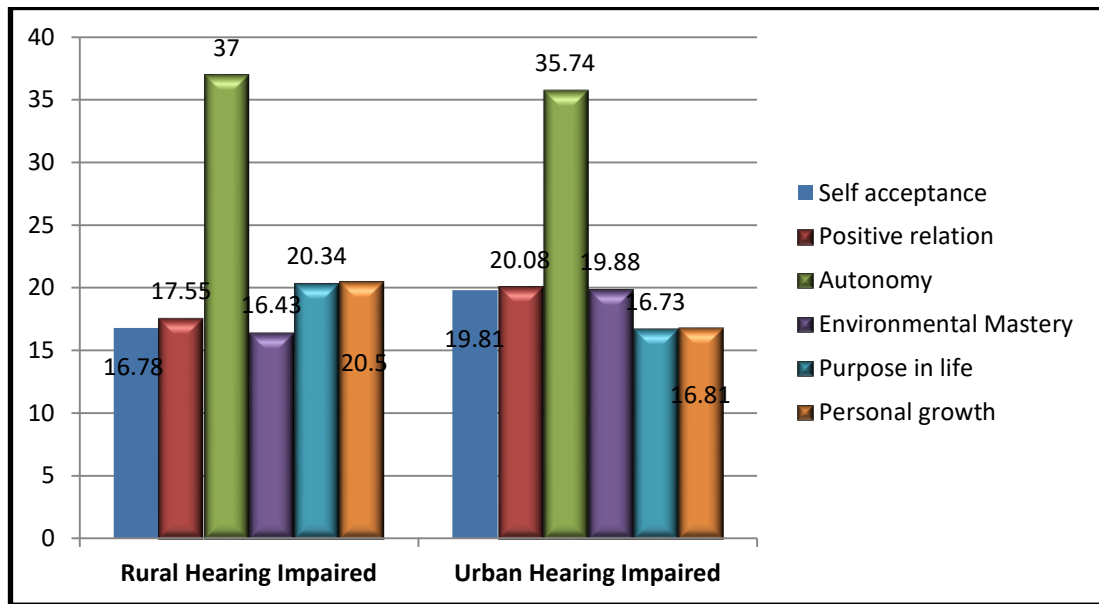
Rural hearing disabled and Urban hearing disabled samples on Psychological well-being

Results revealed that the Urban hearing-impaired group scored higher than the Rural hearing-disabled group with a significant level on Purpose in Life (M=20.34; 16.81; $t= 1.60$; $p<.01$), Personal Growth (M=20.50; 16.81; $t= 1.88$; $p<.01$) and Autonomy (M=37.00; 35.74; $t= 1.42$; $p<.01$); and the Rural hearing-impaired group scored lower than the Urban hearing-impaired group groups with significant difference between the two groups on Self-acceptance (M=16.78; 19.81; $t= 6.18$; $p<.01$), Positive relations with others (M=17.55; 20.08; $t= 6.27$; $p<.01$), and Environmental Mastery (M=16.43; 19.88; $t= 6.31$; $p<.01$) as presented in Table-6.

Table-6: Showing Mean, SD, Kurtosis, Skewness and Mean significant difference (t-test) between Urban Hearing disabled and Rural Hearing disabled on Psychological well-being.

Groups	Statistics	Dependent Variables of <i>Psychological Well-Being</i>					
		Self-acceptance	Positive relations with others	Autonomy	Environmental mastery	Purpose in life	Personal growth
Urban Hearing Impaired	Mean	16.78	17.55	37.00	16.43	20.34	20.50
	SD	3.73	3.86	4.74	3.91	3.21	3.14
	Kurtosis	0.03	0.49	0.32	0.39	0.29	1.15
	Skewness	0.26	0.31	0.14	0.27	0.16	0.24
Rural Hearing Impaired	Mean	19.81	20.08	35.74	19.88	16.73	16.81
	SD	3.91	3.20	4.33	2.45	2.93	2.08
	Kurtosis	0.40	0.75	0.41	0.77	0.20	0.31
	Skewness	0.24	0.52	0.41	0.72	0.31	0.24
t-test between Urban and Rural hearing-impaired		6.18**	6.27**	1.42*	6.31**	1.88*	1.60**

Figure-10: Showing the mean difference between Rural Hearing disabled and Urban Hearing disabled groups on psychological well-being.



Objective-3: To examine the significant difference between Female Hearing disabled and Male Hearing disabled samples on Mental Health Problems and psychological well-being. To determine the significant difference between the Female hearing-impaired and Male hearing-impaired samples on Mental Health Problems and psychological well-being, a t-test was computed.

Female Hearing disabled and Male Hearing disabled samples on Mental Health Problems

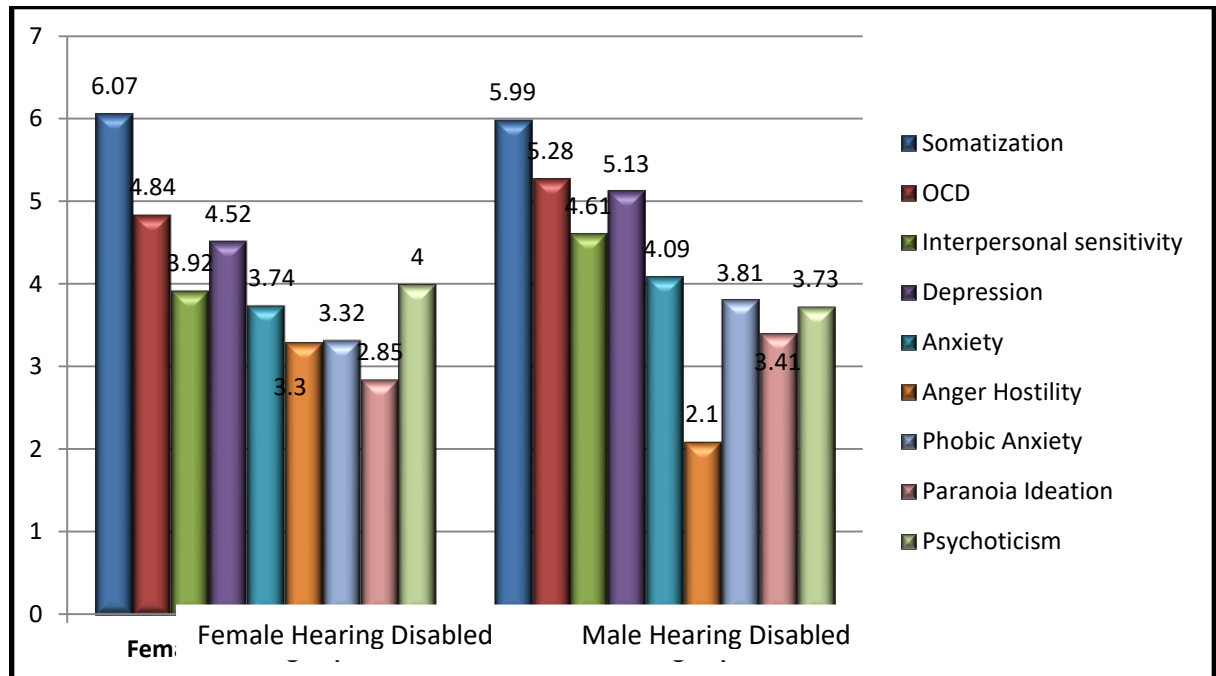
Results demonstrated Male hearing disabled scored higher than the Female hearing disabled with a significant difference in Somatization (M=6.67, 5.99; t= 4.49; p<.01), and Psychoticism (M=4.00, 3.13; t= 4.49; p<.01) whereas, on OCD (M=4.84, 5.28; t= 7.18; p<.01), Inter-personal sensitivity (M=3.92, 4.61; t= 3.31; p<.01), Depression (M=4.52, 5.13; t= 3.63; p<.01), Anxiety (M=3.74, 4.09; t= 3.38; p<.01), Phobic Anxiety (M=3.32, 3.81; t= 4.77; p<.01), Paranoid Ideation (M=2.85, 3.41; t= 6.11; p<.01) scored lower than Females hearing disabled group; and male hearing disabled scored higher on Anger/hostility but not at a significant level (M=3.30, 2.10; t= 1.51; p<.61) as presented in Table-7.

The results also revealed higher scores found in women than males on Mental Health Problems and lower scores on psychological well-being which pave the way for accepting *hypothesis no-3*. Additionally, the results have got supporting research evinced that a high prevalence of hearing disability among women (Ritsner et al., 2000), more obsessions (Tükel et al., 2004), more interpersonally sensitivity (Hall, Murphy, & Mast, 2006), higher major depression (Andrade et al., 2003) with a prevalence of anxiety twice as higher than men (Bandelow et al., 2015), higher fear anxiety (Fredrikson et al., 1996), higher levels of paranoia (Ciarrochi, Hynes, & Crittenden, 2005) but lower hostility/Anger/hostility (Fava et al., 1995) than men whereas some findings provided a higher level of paranoia (Freeman et al., 2011) and psychoticism in male (Lynn & Martin, 1997).

Table-7: Showing Mean, SD, Kurtosis, Skewness and significant Mean difference (t-test) between Male Hearing- disabled and Female Hearing- disabled on Mental Health Problems.

Groups	Statistics	Mental Health Problems								
		Somatization	OCD	Interpersonal Sensitivity	Depression	Anxiety	Anger/Hostility	Phobic Anxiety	Paranoid Ideation	Psychoticism
Male Hearing disabled	Mean	6.07	4.84	3.92	4.52	3.74	3.30	3.32	2.85	4.00
	SD	1.98	1.60	0.57	0.83	0.94	0.90	0.91	0.70	1.14
	Kurtosis	-0.59	0.09	-0.73	-0.06	0.72	0.33	-0.24	0.08	0.90
	Skewness	0.14	-0.23	0.55	0.10	0.18	0.04	0.19	0.39	0.89
female Hearing disabled	Mean	5.99	5.28	4.61	5.13	4.09	2.10	3.81	3.41	3.13
	SD	1.93	1.39	1.45	1.70	1.03	0.38	0.23	0.56	0.55
	Kurtosis	0.56	0.26	0.49	0.31	0.37	0.67	0.02	0.49	0.49
	Skewness	0.16	0.36	0.66	0.51	0.16	0.25	0.30	0.21	0.47
t-test between male and female hearing-impaired		4.49**	7.18**	3.31**	3.63**	3.38**	1.51	4.77**	6.11**	4.49**

Figure-11: Showing Mean difference (t-test) between Male Hearing- disabled and Female Hearing- disabled on Mental Health Problems.



Male hearing disabled and Female hearing disabled on psychological well-being

Results evinced that the Male hearing impaired scored higher than the Females hearing impaired group with a significant level of Positive relations with others (M=27.13, 26.11; t= 1.63; p<.01), Autonomy (M=37.71, 35.95; t= 1.47; p<.01), Environmental Mastery (M=26.95, 24.43; t= 1.44; p<.01) whereas Male hearing impaired scored lower than female hearing disabled group with a significant level on Self-acceptance (M=25.45, 27.93; t= 1.66; p<.01), Purpose in Life (M=26.11, 27.06; t= 1.87; p<.01) and Personal Growth (M=25.06, 27.35; t= 1.60; p<.15).

The results revealed that female hearing impaired samples scored higher on Mental Health Problems but scored lower on psychological well-being than urban hearing-impaired samples, which accepted ***hypothesis no3*** - of the study, and the findings also supported the earlier research findings that rural areas had a higher prevalence of psychological well-being (Brennan-Jones et al., 2015), have higher self-acceptance (Swartz et al., 1989), have a higher level of positive relations

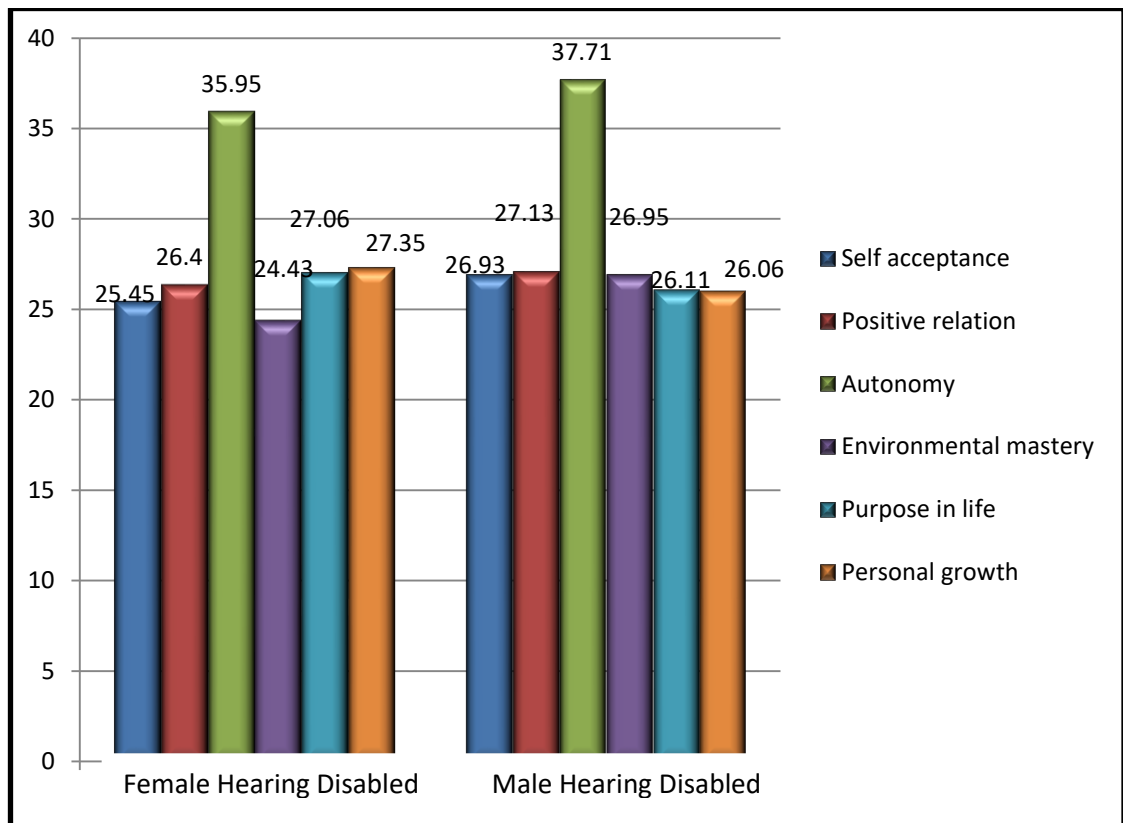
(Devaramane & Yenagi, 2019) than urban hearing disabled. Some findings depicted that urban has a higher score in autonomy (Devaramane & Yenagi, 2019), environmental mastery (Devaramane & Yenagi, 2019), positive relations and purpose in life (Devaramane & Yenagi, 2019) than rural hearing-disabled samples. Overall scores demonstrated higher psychological well-being in hearing disabled from rural areas than in hearing disabled from urban areas (Oguzturk. 2008).

Female Hearing disabled and Male Hearing disabled samples on psychological Well-being

Table-8: Showing Mean, SD, Kurtosis, Skewness and Mean significant difference (t-test) between Female Hearing disabled and Male Hearing- disabled on Psychological well-being.

Groups	Statistics	Dependent Variables of Psychological Well-Being					
		Self-acceptance	Positive relations	Autonomy	Environmental mastery	Purpose in life	Personal growth
Female Hearing disabled	Mean	25.45	26.10	35.95	24.43	27.06	27.35
	SD	05.96	05.56	05.68	04.58	04.70	04.66
	Kurtosis	00.33	00.43	-00.36	00.39	00.34	00.34
	Skewness	01.00	00.09	00.25	00.08	00.11	00.07
Male Hearing disabled	Mean	27.93	27.13	37.71	26.95	25.11	26.06
	SD	04.87	4.88	04.64	04.96	04.13	04.14
	Kurtosis	00.25	00.33	00.23	00.33	00.24	00.28
	Skewness	00.28	00.26	00.46	00.45	0035	00.34
t-test between male and female hearing-impaired		1.06*	1.63*	1.42*	1.44**	1.87*	1.60**

Figure-12: Showing the mean difference between Female Hearing disabled and Male Hearing disabled groups on Psychological well-being.



The results demonstrated Female hearing-disabled samples showed higher scores on psychopathological symptoms but lower scores on psychological well-being than Male hearing-disabled samples which accepted the **hypothesis-3**, and the finding showed consistency with earlier findings that a high prevalence among women than male hearing disabled (Ritsner et al., 2000), more prone to contamination of obsessions (Tükel et al., 2004), more interpersonally sensitive (Hall, Murphy, & Mast, 2006), higher rates of major depression (Andrade et al., 2003), approximately twice higher than men with higher prevalence of anxiety (Bandelow et al., 2015), a low hostility/Anger/hostility than men (Fava et al., 1995), higher fear anxiety (Fredrikson et al., 1996), higher levels of paranoia than male

(Ciarrochi, Hynes, & Crittenden, 2005) whereas a higher level of paranoia (Freeman et al., 2011), and psychoticism (Lynn & Martin, 1997) than female.

Objectives-4: To examine the significant relationship between Mental Health Problems and psychological well-being among the samples. To determine the independent effect of the independent variables on the dependent variable, the ANOVA was employed and displayed in Table-9.

Table-9: Showing the significant relationship (Pearson's correlations) between dependent variables among the samples.

Dependent Variables	Somatization	OCD	Interpersonal sensitivity	Depression	Anxiety	Anger/hostility	Phobic anxiety	Paranoia ideation	Psychoticism	Self-acceptance	Positive relation	Autonomy	Environmental mastery	Purpose in life	Personal growth
Somatization	1	.57**	.33**	.32**	.39**	.04	.41**	.37**	.43**	-.62**	-.61**	-.49**	-.51**	-.59**	.09
OCD		1	.52**	.42**	.38**	.09	.56**	.61**	.61**	-.62**	-.52**	-.53**	-.47**	-.50**	-.08
Interpersonal sensitivity			1	.40**	.45**	.26**	.49**	.49**	.52**	-.62**	-.62**	-.51**	-.53**	-.51**	-.12
Depression				1	.24**	.14*	.50**	.43**	.36**	-.50**	-.52**	-.40**	-.52**	-.46**	.07
Anxiety					1	.21**	.40**	.30**	.48**	-.45**	-.45**	-.27**	-.51**	-.43**	-.04
Anger/hostility						1	.32**	.22**	.24**	-.03	-.07	-.04	-.08	-.07	-.34**
Phobic Anxiety							1	.53**	.53**	-.50**	-.52**	-.52**	-.53**	-.52**	-.17*
Paranoia ideation								1	.51**	-.51**	-.51**	-.52**	-.51**	-.53**	-.18**
Psychoticism									1	-.52**	-.53**	-.57**	-.52**	-.51**	-.15*
Self-acceptance										1	.61**	.57**	.53**	.53**	.08
Positive relation											1	.53**	.51**	.52**	.04
Autonomy												1	.53**	.48**	.07
Environmental mastery													1	.45**	.02
Purpose in life														1	.10
Personal growth															1

** . Correlation is significant at the 0.01 level (2-tailed) , * . Correlation is significant at the 0.05 level (2-tailed).

To examine any significant relationship between the dependents (among the subscales of Mental Health Problems and psychological well-being) was computed by employing Pearson's correlation, and the results were provided in Table-9. Results showed a significant negative relationship between the Mental Health Problems and psychological well-being subscales, in almost all of the sub-scales.

Results demonstrated that Somatization had a positive significant relationship with OCD ($r=.57$ $p<.01$), Interpersonal sensitivity ($r=.33$ $p<.01$), Depression ($r=.32$ $p<.01$), Anxiety ($r=.39$ $p<.01$), Phobic Anxiety ($r=.41$ $p<.01$), Paranoia ideation ($r=.37$ $p<.01$), Psychoticism ($r=.43$ $p<.01$) whereas negative significant relationship with Self-acceptance ($r=-.62$ $p<.01$), Positive relation ($r=-.61$ $p<.01$), Autonomy ($r=-.49$ $p<.01$), Environmental mastery ($r=-.51$ $p<.01$), and Purpose in life ($r=-.59$ $p<.01$).

(i) OCD showed a positive relationship with Interpersonal sensitivity ($r=.52$ $p<.01$), Depression ($r=.42$ $p<.01$), Anxiety ($r=.3809$ $p<.01$), Phobic Anxiety ($r=.56$ $p<.01$), Paranoia ideation ($r=.61$ $p<.01$), and Psychoticism ($r=.61$ $p<.01$) but negative significant relationship with Self-acceptance ($r=-.62$ $p<.01$), Positive relation ($r=-.52$ $p<.01$), Autonomy ($r=-.53$ $p<.01$), Environmental mastery ($r=-.47$ $p<.01$), and Purpose in life ($r=-.50$ $p<.01$) whereas not significant with anger hostility and personal growth.

(ii) Interpersonal sensitivity demonstrated a positive significant relationship with Depression ($r=.40$ $p<.01$), Anxiety ($r=.45$ $p<.01$), Anger hostility ($r=.26$ $p<.01$), Phobic Anxiety ($r=.49$ $p<.01$), Paranoia ideation ($r=.49$ $p<.01$), and Psychoticism ($r=.52$ $p<.01$), while a negative significant relationship with Self-acceptance ($r=-.62$ $p<.01$), Positive relation ($r=-.62$ $p<.01$), Autonomy ($r=-.51$ $p<.01$), Environmental mastery ($r=-.5351$ $p<.01$), and Purpose in life ($r=-.51$ $p<.01$).

(iii) Depression revealed a significant relationship with Anxiety ($r=.24$ $p<.01$), anger hostility ($r=.14$ $p<.05$), Phobic Anxiety ($r=.50$ $p<.01$), Paranoia ideation ($r=.43$ $p<.01$), and Psychoticism ($r=.36$ $p<.01$) whereas negative significant relationship with Self acceptance ($r=-.50$ $p<.01$), Positive relation ($r=-.52$ $p<.01$), Autonomy ($r=-.40$ $p<.01$), Environmental mastery ($r=-.52$ $p<.01$), and Purpose in life ($r=-.4659$ $p<.01$).

(iv) Anxiety showed a positive significant relationship with anger hostility ($r=.21$ $p<.01$), Phobic Anxiety ($r=.40$ $p<.01$), Paranoia ideation ($r=.30$ $p<.01$), and Psychoticism ($r=.48$ $p<.01$), while a negative significant relationship with Self-

acceptance ($r=-.45$ $p<.01$), Positive relation ($r=-.45$ $p<.01$), Autonomy ($r=-.27$ $p<.01$), Environmental mastery ($r=-.51$ $p<.01$), and Purpose in life ($r=-.43$ $p<.01$).

(v) Anger hostility demonstrated a significant relationship with Phobic Anxiety ($r=.32$ $p<.01$), Paranoia ideation ($r=.22$ $p<.01$), and Psychoticism ($r=.24$ $p<.01$), but a negative significant relationship with Purpose in life ($r=-.34$ $p<.01$).

(vi) Phobic Anxiety evinced a significant relationship with Paranoia ideation ($r=.53$ $p<.01$), Psychoticism ($r=.53$ $p<.01$) while a negative relationship with Self-acceptance ($r=-.50$ $p<.01$), Positive relation ($r=-.52$ $p<.01$), Autonomy ($r=-.52$ $p<.01$), Environmental mastery ($r=-.53$ $p<.01$), and Purpose in life ($r=-.52$ $p<.01$).personal growth ($r=.17$ $p<.05$).

(vii) Paranoia ideation showed a positive significant relationship with Psychoticism ($r=.51$ $p<.01$) but while a negative relationship with Self-acceptance ($r=-.51$ $p<.01$), Positive relation ($r=-.51$ $p<.01$), Autonomy ($r=-.52$ $p<.01$), Environmental mastery ($r=-.53$ $p<.01$), Purpose in life ($r=-.52$ $p<.01$), and personal growth ($r=.17$ $p<.01$).

(viii) Psychoticism revealed a negative significant relationship with Self-acceptance ($r=-.52$ $p<.01$), Positive relation ($r=-.5361$ $p<.01$), Autonomy ($r=-.57$ $p<.01$), Environmental mastery ($r=-.52$ $p<.01$), and Purpose in life ($r=-.51$ $p<.01$), personal growth ($r=.1541$ $p<.05$).

(ix) Self acceptance substantiated Positive relation ($r=-.61$ $p<.01$), Autonomy ($r=-.57$ $p<.01$), Environmental mastery ($r=-.53$ $p<.01$), and Purpose in life ($r=-.5359$ $p<.01$).

(x) Positive relation showed a negative relationship with Autonomy ($r=-.5349$ $p<.01$), Environmental mastery ($r=-.51$ $p<.01$), and Purpose in life ($r=-.52$ $p<.01$).

(xi) Autonomy demonstrated a negative significant relationship with Environmental mastery ($r=-.53$ $p<.01$), and Purpose in life ($r=-.48$ $p<.01$).

(xii) Environmental mastery had a positive significant relationship with Purpose in life ($r=-.45$ $p<.01$).

The results of the present study got supports some earlier research findings that there was a strong correlation between anxiety, depression, obsession and mental health and quality of life (Geocze et al., 2018); hearing loss invites anxiety, stress, and fatigue (Arslan et al., 2018); higher paranoia, phobic anxiety, paranoid ideation, social phobia related to hard concern for self-appearance and interpersonal insensitivity (Eleuteri et al., 2010); depression, anxiety, paranoid ideation and interpersonal sensitivity appeared together in old aged hearing loss (Johannes et al., 2012); interpersonal sensitivity predicts depression (Chahar et al., 2020; Boyce, Parker, Barnett, Cooney, & Smith, 1991), social anxiety disorder (Harb, Heimberg, Fresco, Schneier, & Liebowitz, 2002; Kumari, Sudhir, & Mariamma, 2012), anxiety (Vidyanidhi & Sudhir, 2009), and psychotic symptoms (Masillo et al., 2012).

Interpersonal sensitivity leads to depression, anxiety, and social phobia (Boyce et al., 1991; Harb et al., 2002), and in reverse a high hostility person prone to more interpersonal conflict (Siegler et al., 2003), more negative, and fewer positive interpersonal interactions (Brondolo et al., 2003). High hostility predicted a high interpersonal conflict (Siegler et al., 2003) with low social functioning (Eleuteri et al., 2010), adults with hearing loss tend to exhibit more symptoms of depression, anxiety, psychological distress, and emotional sensitivity as compared to people with normal hearing (Iwagami et al., 2019).

The results evinced that the negative relationship between the subscales of Mental Health Problems and psychological well-being confirmed the *hypothesis no-4*, and the findings were also in line with the earlier findings which mentioned that Hearing disabled persons are more prone to depression, anxiety, interpersonal sensitivity, hostility (Monzani et al., 2008), problems and sociological maladjustment (Tidball, 1990), restless, distractible, hypersensitive, aggressive, lack of perseverance, self-conscious, suggestible, lack self-confidence, temper outbursts, demanding, and so on (Dharitri & Murthy, 1990). Several findings demonstrated that Mental Health Problems negatively correlated with psychological well- (Casullo &

Castro, 2002), Mexico (Pérez et al, 2010), and those who perceive more psychological well-being showed lower symptoms of psychopathology (Winefield et al., 2012).

Objective-5: To examine any significant independent effect of ‘hearing disability’, ‘ecology’, and ‘gender’ on Mental Health Problems and psychological well-being. The ANOVA was calculated to determine the Independent effect of Independent variables among dependent variables as shown in Table-10.

Independent effect of ‘hearing disability’, ‘ecology’ and ‘gender’ on Mental Health Problems

Table-10: Showing ‘Independent effect’ of ‘hearing disability’, ‘ecology’ and ‘gender’ (One-way ANOVA) on Mental Health Problems.

Dependent variables	Independent variables					
	Hearing Disability effect		Ecology effect		Gender effect	
	Eta square	Sig.	Eta square	Sig.	Eta square	Sig.
Somatization	.25	0.01	.21	0.01	.08	0.05
OCD	.43	0.01	.05	0.05	.17	0.01
Interpersonal Sensitivity	.33	0.01	.06	0.05	.04	0.11
Depression	.23	0.01	.06	0.05	.29	0.02
Anxiety	.16	0.01	.08	0.05	.22	0.01
Anger/ hostility	.02	0.07	.01	0.41	.33	0.01
Phobic Anxiety	.24	0.01	.10	0.05	.35	0.01
Paranoid Ideation	.39	0.01	.37	0.01	.27	0.01
Psychoticism	.38	0.01	.05	0.05	.34	0.01

The results in Table-10 evinced that:

(i) The ‘hearing disability’ showed a significant independent effect on Somatization was 25% with significance at 01 levels ($\eta^2=.25$; $p<.01$), OCD was 43% with significance at .01 levels ($\eta^2=.43$; $p<.01$), Interpersonal Sensitivity was 33% with significance at .01 levels ($\eta^2=.33$; $p<.01$), Depression was 23% with significance at .01 levels ($\eta^2=.23$; $p<.01$), Anxiety was 16% with significance at .01 levels ($\eta^2=.16$; $p<.01$), Phobic Anxiety was 24 % with significance at .01 levels ($\eta^2=.24$; $p<.01$), Paranoid Ideation was 39 % with significance at .01 levels ($\eta^2=.39$; $p<.01$), and Psychoticism was 38 % with significance at .01 levels ($\eta^2=.38$; $p<.01$), not significant on anger/hostility ($\eta^2=.02$; $p<.07$);

(ii) the ‘ecology’ had a significant independent effect on Somatization was 21% with significance at 01 levels ($\eta^2=.21$; $p<.01$), OCD was 5% with significance at .05 levels ($\eta^2=.05$; $p<.05$), Interpersonal Sensitivity was 5% with significance at .05 levels ($\eta^2=.05$; $p<.05$), Depression was 6% with significance at .05 levels ($\eta^2=.06$; $p<.05$), Anxiety was 8% with significance at .05 levels ($\eta^2=.08$; $p<.05$), Phobic Anxiety was 10% with significance at .05 levels ($\eta^2=.10$; $p<.05$), Paranoid Ideation was 37 % with significance at .01 levels ($\eta^2=.37$; $p<.01$), and Psychoticism was 5% with significance at .05 levels ($\eta^2=.05$; $p<.05$); and

(iii) the ‘gender’ obtained a significant effect on Somatization was 8% with significance at .05 levels ($\eta^2=.08$; $p<.05$), OCD was 17% with significance at .01 levels ($\eta^2=.17$; $p<.01$), Depression was 29% with significance at .05 levels ($\eta^2=.29$; $p<.05$), Anxiety was 29% with significance at .01 levels ($\eta^2=.29$; $p<.01$), Phobic Anxiety was 35% with significance at .01 levels ($\eta^2=.35$; $p<.01$), Paranoid Ideation was 27% with significance at .01 levels ($\eta^2=.27$; $p<.01$), and Psychoticism was 34 % with significance at .01 levels ($\eta^2=.34$; $p<.01$) but not significant on Interpersonal Sensitivity ($\eta^2=.04$; $p<.11$).

The results demonstrated the acceptability of *hypothesis no -5* that ‘hearing disability’, ‘ecology and’, and ‘gender’ showed an independent effect on the subscales of Mental Health Problems and psychological well-being among the hearing-impaired subjects. In this line, several studies also found that hearing-

impaired persons are more prone to depression, anxiety, interpersonal sensitivity, hostility (Monzani et al., 2008), problems and sociological maladjustment (Tidball, 1990), restlessness, distractible, hypersensitive, Anger/ hostility, lack of perseverance, self-conscious, suggestible, lack self-confidence, temper outbursts, and demanding (Dharitri & Murthy,1990).

The results of the study showed a significant difference between rural and urban hearing impaired which also confirmed the third hypothesis; earlier research findings were also in line with the present study that higher anxiety disorders were found in the urban area than in rural areas (Vassos et al., 2016), Anger/hostility/hostility was greater among the subjects of urban areas than rural areas (Bisht & Sharma, 2021), the rural were more susceptibility to paranoia than urban (Mirowsky & Ross, 1983), and greater paranoid ideation among rural with lower socio-economic status (Freeman et al., 2011).

Overall findings of the study highlighted the independent effect of ‘hearing impairment’, ‘ecology’, and ‘gender’ on Mental Health Problems among hearing-impaired people but it needs more research and more in-depth study.

Objectives-6: To examine the significant interaction effect of ‘hearing disability and ecology’, ‘hearing disability and gender’, ‘ecology and gender’ and ‘hearing disability and ecology and gender’ on Mental Health Problems and psychological well-being.

Table-11: Showing ‘interaction effect’ of ‘hearing disability and ecology’, hearing disability and gender’, ‘ecology and gender’ (two-way ANOVA), and ‘hearing disability X ecology X gender’ (three-way ANOVA) on Mental Health Problems for the sample.

Dependent variables	Independent variables							
	Hearing disability X Ecology		Hearing disability X Gender		Ecology and Gender		Hearing disability X Ecology X Gender	
	Eta square	Sig.	Eta square	Sig.	Eta square	Sig	F	Eta square
Somatization	.34	0.01	.21	0.01	.26	0.01	.19	0.01
OCD	.31	0.01	.30	0.01	.20	0.01	.28	0.01
Interpersonal Sensitivity	.22	0.01	.35	0.01	.23	0.01	.22	0.01
Depression	.21	0.01	.20	0.01	.04	0.05	.12	0.01
Anxiety	.19	0.01	.13	0.05	.04	0.05	.28	0.01
Anger/ hostility	.02	0.08	.09	0.06	.19	0.01	.23	0.15
Phobic Anxiety	.20	0.01	.22	0.01	.32	0.01	.26	0.01
Paranoid Ideation	.25	0.01	.18	0.01	.26	0.01	.15	0.01
Psychoticism	.21	0.01	.40	0.01	.16	0.05	.17	0.01

The findings were presented under the following sequence:

- 1) ‘Hearing disability and ecology’ together showed a significant effect on Somatization was 34% with significance at 01 levels ($\eta^2=.34$; $p<.01$), OCD was 31% with significance at .01 levels ($\eta^2=.31$; $p<.01$), Interpersonal Sensitivity was 22% with significance at .01 levels ($\eta^2=.22$; $p<.01$), Depression was 21% with significance at .01 levels ($\eta^2=.21$; $p<.01$), Anxiety was 19% with significance at .01 levels ($\eta^2=.19$; $p<.01$), Phobic Anxiety was 20 % with significance at .01 levels ($\eta^2=.20$; $p<.01$), Paranoid Ideation was 25 % with significance at .01 levels ($\eta^2=.25$;

$p < .01$), and Psychoticism was 21 % with significance at .01 levels ($\eta^2 = .21$; $p < .01$), not significant on Anger/ hostility;

2) 'Hearing disability and gender' demonstrated a significant effect on Somatization was 21% with significance at 01 levels ($\eta^2 = .21$; $p < .01$), OCD was 30% with significance at .01 levels ($\eta^2 = .30$; $p < .01$), Interpersonal Sensitivity was 21% with significance at .01 levels ($\eta^2 = .21$; $p < .01$), Depression was 20% with significance at .01 levels ($\eta^2 = .20$; $p < .01$), Anxiety was 13% with significance at .01 levels ($\eta^2 = .13$; $p < .01$), Phobic Anxiety was 22 % with significance at .01 levels ($\eta^2 = .22$; $p < .01$), Paranoid Ideation was 18 % with significance at .01 levels ($\eta^2 = .18$; $p < .01$), and Psychoticism was 27 % with significance at .01 levels ($\eta^2 = .27$; $p < .01$), not significant on Anger/ hostility; and

3) The 'Ecology and gender' interaction effect was calculated using the two-way ANOVA) showing a significant interaction effect on Somatization was 26% with significance at 01 levels ($\eta^2 = .26$; $p < .01$), OCD was 20% with significance at .01 levels ($\eta^2 = .20$; $p < .01$), Interpersonal Sensitivity was 23% with significance at .01 levels ($\eta^2 = .23$; $p < .01$), Depression was 14% with significance at .05 levels ($\eta^2 = .14$; $p < .05$), Anxiety was 5% with significance at .05 levels ($\eta^2 = .05$; $p < .05$), Anger/ hostility was 19% with significance at .01 levels ($\eta^2 = .19$; $p < .01$), Phobic Anxiety was 32 % with significance at .01 levels ($\eta^2 = .32$; $p < .01$), Paranoid Ideation was 26 % with significance at .01 levels ($\eta^2 = .26$; $p < .01$), and Psychoticism was 16 % with significance at .01 levels ($\eta^2 = .16$; $p < .01$); and

4) The significant interaction effect of 'Hearing disability X ecology X gender' was ascertained using the three-way ANOVA, and the results exposed that Somatization was 9% with significance at 01 levels ($\eta^2 = .19$; $p < .01$), OCD was 28% with significance at .01 levels ($\eta^2 = .28$; $p < .01$), Interpersonal Sensitivity was 22% with significance at .01 levels ($\eta^2 = .22$; $p < .01$), Depression was 12% with significance at .05 levels ($\eta^2 = .12$; $p < .05$), Anxiety was 28% with significance at .05 levels ($\eta^2 = .28$; $p < .05$), Anger/hostility was 21% with significance at .01 levels ($\eta^2 = .21$; $p < .01$), Phobic Anxiety was 26 % with significance at .01 levels ($\eta^2 = .26$; $p < .01$), Paranoid

Ideation was 15 % with significance at .01 levels ($\eta^2=.15$; $p<.01$), and Psychoticism was 17 % with significance at .01 levels ($\eta^2=.17$; $p<.01$).

The results accepted the *hypothesis-6* and also confirmed the earlier findings that hearing-impaired persons have greater difficulty in listening and communicating with others resulting in poor mental health (Muazzam & Jabeen, 2016), ageing considerably contributes to increased risk of morbidity, poor self-perceived health, poor psychological well-being, low self-efficacy and happiness (Ejaz et al., 2020) which linked to anxiety, cognitive decline and lower health-related quality of life (Mehboob et al., 2019). Hearing disabled constantly coping with stressful situations in their daily life (Muazzam & Ahmad, 2017) results in more vulnerable to depression, decreased well-being, emotional sensitivity and Anger/hostility (Cosh et al., 2019), anxiety, psychological distress, emotional sensitivity (Iwagami et al., 2019). Consequently, hearing loss experiences diminished self-esteem and psychological well-being (Dean et al., 2017).

All mentioned findings explained that hearing impairment, ecology, and gender are interacting and the outcomes seriously promote Mental Health Problems and decreased psychological well-being of an individual.

CHAPTER - VI: SUMMARY AND CONCLUSION

Summary and Conclusion:

The present study topic titled, “The Mental Health Problems and Psychological well-being of people with hearing disabilities: A study among Aimol tribe of Manipur” was designed to study the prevalence and level of Mental Health Problems and psychological well-being among the hearing disabled in the Aimol tribe along with ecological and gender differences. The study focused on Mental Health Problems (Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Aggression, Phobic Anxiety, Paranoid Ideation and Psychoticism) and Psychological well-being (self-acceptance, positive relations with, autonomy, environmental mastery, purpose in life, personal growth) to examine the significant differences among the groups (hearing impaired and normal hearing, rural hearing impaired and urban hearing impaired, and female hearing disabled and male hearing-impaired group, to identify any significant positive or negative relationship, and to determine any significant independent and interaction effect of the independent variables on dependent variables among the targeted population. To evaluate the Mental Health Problems and psychological well-being of the subject two psychological tests namely-*The Symptom Checklist 90 Revised (SCL-90-R; Derogatis, 1983)* and *the Psychological Well-Being (Ryff & Keyes 1995)* were used.

To meet the objectives of the study, 200 Aimol samples comprised of 100 Aimol hearing impaired and 100 Aimol normal hearing with equal representation of Hearing impaired (Hearing impaired and normal hearing samples), ecology (rural and urban hearing impaired samples), gender (male and female hearing impaired samples), age range between 18 to 69 years of age were selected through a purposive random sampling procedure. The hearing-impaired samples were identified by a medical team of the government of Manipur as well as organized assessment of hearing camps by qualified audiologists using audiometers. The normal hearing samples were selected to well-match with the hearing-impaired samples on demographic profiles such as age, sex, education, monthly income of the family, size of a sibling, and rank in the sibling from the general population. The Correlational design was used to compare two hearing impaired levels (Hearing impaired and Normal hearing samples), 2 ecologies (100 Rural and 100 Urban hearing impaired

samples), and 2 genders (100 Males and 100 Females hearing impaired samples) were initiated for the eight cells of the designs. The administration of the psychological test was strictly conducted following the instruction given in the test manuals and the Ethical principles of psychologists for research - the Code of Conduct (APA, 2002). The sample characteristics of the study were an age range from 18 to 68 years as well as distribution of age, education level range between class II to graduate level, monthly income distribution range from Rs. 1000 to 3lakh, the size of family range from 3 to 13 members, and the size of sibling range from 2-11 siblings served as the sample.

The study was framed with the objectives of examining any significant difference between Hearing impaired samples and Normal hearing samples, Rural hearing-impaired samples and Urban hearing impaired samples, Female hearing impaired samples and Male hearing impaired samples on Mental Health Problems and psychological well-being; to examine any significant relationship between Mental Health Problems and psychological well-being; to examine any significant independent effect of 'hearing impairment', 'ecology', and 'gender' and significant interaction effect on Mental Health Problems and psychological wellbeing.

To meet the objectives of the study, hypotheses were also framed that Hearing impaired samples will score higher on Mental Health Problems and will score lower on psychological well-being than normal hearing samples; Urban hearing impaired samples will score higher on Mental Health Problems but score lower on psychological well-being than urban Rural hearing impaired samples; Female hearing impaired samples will have higher scores on psychopathological symptoms but lower scores on psychological well-being than Male hearing impaired samples; Psychological problem will have a significant negative relationship with Psychological well-being; 'Hearing impairment', 'Ecology', and 'Gender' will have a significant independent effect on Mental Health Problems and psychological well-being; and the 'Hearing impairment x Ecology', 'Hearing impairment x Gender', 'Ecology x Gender' and 'Hearing impairment x Ecology x Gender' will have significant interaction effects on Mental Health Problems and psychological well-being.

The present study used, the *Symptom Checklist 90 Revised (SCL-90-R;* Derogatis, 1983) to measure Mental Health Problems and *Psychological Well-Being (Ryff & Keyes 1995)* to measure the psychological well-being of the samples. The Correlational design was used to compare the two levels of hearing disability (Hearing impaired and Normal hearing samples), two levels of ecologies (100 Rural and 100 Urban hearing disabled samples), and two levels of genders (100 Males and 100 Females hearing disabled samples) which initiated eight cells. The administration of the psychological test was strictly conducted following the instruction given in the test manuals and the Ethical principles of psychologists for research - the Code of Conduct (APA, 2002).

The samples were collected from the Aimol community settled in Manipur state. Samples of hearing impaired /impairment were collected from the list of identified persons who suffer from hearing impaired /loss of hearing by the Government of Manipur and recognized NGOs (recognized by the government of India and the state of Manipur Government). The samples of the study had an equal representation of hearing disabled and normal hearing, urban and rural hearing impaired, and female and male hearing disabled were randomly selected from the list of registered Hearing impaired /hearing disabled from the list of hospitals and NGOs run and recognized by the Manipur State Government whereas the normal hearing samples were selected with an aimed of well-match of the hearing impaired samples following purposive sampling procedure on the ground of demographic profiles such as locality, gender, age, education, monthly income, family size and sibling size to keep away from extraneous variable influence.

The sample characteristics of the study were an age range from 18 to 68 years as well as a distribution of different age groups (18-28 years =18%; 29-38 years =19%; 39-48 years =20%; 49-58 years =21%; 59-68 years =22%); distribution of education level range between class II to graduate level (below class X=30%; matriculation to graduate BA=33%; graduate; below MA=37%); monthly income distribution is range from Rs. 1000 to 3lakh (below Rs. 5000=38%; 5001-10000=27%; 10001 – 50000=19%; 100001-200000=11%; 200001-above=5%); the size of family range from 3 to 13 family members (below 7 member=44%; 5-8

members=38%; 9-13 members =18%); the size of sibling range from 2- 11 siblings (2-5=49%; 5-8=37%; 9-12=14%) served as the sample.

Firstly the raw was ensured for any missing and extreme outliers which can adulterate the results of the study. The researcher carefully checked out to find any missing or incomplete data from the datasheet as no missing or extreme outliers not presented, and then decided to go forward for further statistical analysis

The two psychological tests employed were standardized tests which were originally constructed for other populations, and need to be checked for appropriateness for the targeted population. A pilot study was done to check the reliability, homogeneity and normality and found the applicability for the selected population under study.

Summary of the Findings:

Following the sequence of the objectives and hypotheses, the sectional analysis and discussion were done as follows:

Objective -1: The significant difference between Hearing disabled and Normal Hearing samples was compared on dependent variables and found significant differences between Hearing impaired and Normal Hearing samples on Mental Health Problems and psychological well-being which confirmed hypothesis -1 as expected.

Objectives -2: The significant difference between Rural Hearing- disabled samples and Urban Hearing- disabled samples on Mental Health Problems and psychological well-being was calculated and found a significant difference between them which accepted the hypothesis-2.

Objectives-3: The significant difference between the Female Hearing disabled and Male Hearing disabled samples on Mental Health Problems and psychological well-being was examined and found significant differences in most of the variables which accepted the hypothesis-3.

Objectives-4: The significant relationship between Mental Health Problems and psychological well-being among the samples was calculated using Pearson's correlations coefficient which demonstrated negative relations between all subscales of Mental Health Problems and psychological well-being but positive relations between the Mental Health Problems, and the same was found between the subscales of the psychological well-beings which accepted the hypothesis-4.

Objective-5: The significant independent effect of 'hearing disability', 'ecology', and 'gender' on Mental Health Problems and psychological well-being was examined and found the significant independent effect of all three independent variables on dependent variables, and confirmed hypothesis 5.

Objective-6: The significant interaction effect of 'hearing disability and ecology', 'hearing disability and gender', 'ecology and gender' and 'hearing disability and ecology and gender' on Mental Health Problems and psychological well-being were examined and found their interaction effect on most of the dependent variables which confirmed the hypothesis 6.

Limitations:

Some limitations existed within this study.

- 1) First, a larger number of samples would provide wider coverage.
- 2) Second, age-wise criteria inclusion could have given more appropriate results for the test items for each age group.
- 3) Third, the Inclusion of criteria on the uses of hearing aids among the samples would give more desirable to see the effect of hearing aids.
- 4) Fourth, Medical treatment and non-treatment criteria could have been included to see the effects of treatment on the used scales.
- 5) Fifth, the inclusion of the types and levels of hearing disability on the dependent variables would provide more information for each level of hearing disability and different types of hearing disabilities.

- 6) Sixth, furthermore-incorporating additional dependent variables such as the age of hearing loss identification, age of rehabilitation acquisition, educational level, and employment status would have assisted the researcher in gaining a deeper understanding of the impact of hearing disability on each individual.

Suggestions:

Based on the limitation faced in the study, some suggestion was made for future research.

- 1) Firstly, the incorporation of a larger number of samples would provide more information that would be more appropriate for generalizing the targeted population.
- 2) Second, the inclusion of the age group in the independent criteria would give more appropriate results of the test items for each different age group.
- 3) Third, the Inclusion of uses of hearing aids such as types of hearing aids, duration of use, and age of using among the samples would give more desirable to see the effect of hearing aids.
- 4) Fourth, Medical treatment and non-treatment criteria could have been included to see the effects of treatment on the used scales.
- 5) Fifth, the inclusion of the types and levels of hearing disability on the dependent variables would give more information.
- 6) Sixth, the inclusion of more dependent variables such as personality, intelligence level, age of identification of hearing loss, educational level, employment status, and other psychological variables was very much attempted to know more about the impact of hearing disability.

Significance of the study:

This research represents one of the initial comprehensive, large-scale examinations delving into Mental Health Problems and psychological well-being within the Aimol community of hearing-disabled individuals. The study delineated the Mental Health Problem levels and psychological well-being of the specified group, elucidating a noteworthy contrast between hearing-disabled individuals and their normal-hearing counterparts. The findings revealed that the hearing-disabled group exhibited higher scores in Mental Health Problems and lower variables in psychological well-being compared to those with normal hearing. Furthermore, a consistent pattern emerged, indicating that rural hearing-disabled individuals scored higher than their urban counterparts.

An additional noteworthy observation was that female hearing-disabled participants scored higher in Mental Health Problems than their male counterparts but demonstrated lower psychological well-being. The study drew upon various psychological theories to shed light on these patterns:

- 1) The Biomedical Theory posits that the collaborative workings of brain neuroanatomy and biochemistry influence psychological processes, with dysfunctions leading to psychopathology. It suggests that chemical imbalances can be addressed through medication and surgery.
- 2) The Psychodynamic Theory asserts that intrapsychic and interpersonal experiences during childhood may contribute to psychopathological behaviours or emotional disorders.
- 3) The Behavior Theory assumes that maladaptive behavior is acquired through environmental and cultural interactions and experiences.
- 4) The Cognitive Theory proposes that cognitive distortion and dysfunction contribute to abnormality.
- 5) The Social Learning Theory postulates that psychopathological behaviors can be influenced by learning through observation, reinforcement, and punishment.

- 6) Social Well-being Theory: Keyes (1998) proposed social well-being as "the appraisal of one's circumstance and functioning in society."

In summary, the study's outcomes indicated a detrimental impact of hearing disability on the psychological well-being of Aimol hearing-impaired individuals. It emphasized the need for heightened attention, particularly among the rural hearing-disabled and female hearing-disabled members of the Aimol community.

APPENDICES

Appendix - I

Informed Consent Form (English)

Purpose: The purpose of this study is to examine the psychological well-being and the problem of the hearing disabled among the Aimol Tribe in the state of Manipur. The study is part of research for the degree of Ph D in Psychology at Mizoram University.

Procedure: If you agree to be in this study, you will be asked to do the following:

1. The estimated required time for completion of the questionnaires is 60 minutes.
2. Please read each group of statements carefully, and then pick out the one response on a statement that best describes the way you have been feeling.
3. There are no right or wrong answers, so please do not spend too much time on one question.
4. By any means you are free to leave at any time, and solely depending on your willingness
4. Please answer all the questions.
5. If you want not to continue participation in this research, any time you are free to do so.

Need of this research:

The research is the first endeavour towards the hearing disabled's well-being & problem for further understanding & treatment advocacy for the same.

Confidentiality:

Your name will never be connected to your results or your responses on the questionnaires; instead, a number will be used for identification purposes. Information that would make it possible to identify you or any other participant will never be included in any sort of report and will keep under confidential. The data will be accessible only to those working on the project.

Contacts and Questions:

If you have questions later, you may contact the following person:

Mr Lanu Wanboy Aimol, Research Scholar. Phn No: 8114615594

Statement of Consent:

I have read the above information. I have asked any questions I had regarding the experimental procedure and they have been answered to my satisfaction. I consent to participate in this study.

Signature of Participant _____ **Date:** _____

Thanks for your participation!

Informed Consent Form (Aimol)

Purpose/ Arui jar:

Hiva tokna/ jet jotna rui hi akuar huilui ngai an lu wakhal huimakna ankhat om huina kan Aimol mi ngaisunga kan ram Manipur sunga ani. Hiva tokna hi under the Mizoram University nuai ja ani.

Procedure/ tho theina:

Hiva chong ding kelna hi tukhat in jet lui rang ani, natak in adik nati ha ril suak ro. Hiva tokna hi ning akuar huilui ngai anpong na, huimak na ankhat om anhui irakip jet na kan nei rang ani.

Confidentiality:Ha anmanirang huina sat na dam na ngaidonna ankhat khella avaat samna rakip mandik thei mansat theina rang ani.

Aphat ni pung khat sung ninati. Akan jiaak rakip hi sat ah enrang ani, athianglui ha om han dingkel thei ani.

Contacts and Questions/ kanphui na:

Athuai mihin dingkel thei ani: Lanu Wanboy Aimol, research scholar, Phn: 8114615594

Statement of Consent/jotna:

Achunga akan jiaak rakip hi ka jet ankhat om kajot ti le kanruai ah kajotna rilsuakna kanei

Signature of Participant/ kut jiaakna _____ Nikhua/ nimal:

Thanks for your participation!

Appendix - III

Socio Demographic Profile of the Sample (English)

1. Name: _____
2. Age: _____
3. Sex: _____
4. Educational Qualification: below class 10/ HSLC/ HSSLC/BA/MA/above MA
5. Monthly Income of the Family:1000-5000/ 5001-10000/10001-50000/50001-100000/100001-200000/200001-300000/above 300001
6. Number of Family: below4/ 4-8/9-13/ above 13
7. Number of sibling/sibling size: below 2/2-5/ 6-8/9-13 siblings
8. Types of hearing Loss:_____
9. Any treatment has taken or not:_____
10. Permanent Address:_____

Appendix - IV

Socio Demographic Profile of the Sample (Aimol)

1. Hming: _____
2. Kum: _____
3. Numei/Pasal: _____
4. Lekha thei: class 10 thuai/ HSLC/ HSSLC/BA/MA/achung MA
5. Thakhat insung loman :1000-5000/ 5001-10000/10001-50000/50001-100000/100001-200000/200001-300000/above 300001
6. Insuhng mimal: mimal 4 thuai/ 4-8/9-13/ mimal 13 chung
7. Insuhng ucha mimal: mimal 2 thuai/2-5/ 6-8/9-13 chung
8. Kuarsep mathial:_____
9. Damlui lei kan enna om mo nimakle kan enlui mo:_____
10. Tak tak omna:_____

Appendix - V

The Symptom Checklist 90 Revised; SCL-90-R; Derogatis, 1983 (Aimol)

Below is a list of problems and complaints that people sometimes have. Please read each one carefully and enter the number that best describes how much you were bothered by that problem during the past week. Please enter only one. For the past week, how much you were bothered by:

SN	Particulars	Not at All	A Little Bit	Moderately	Quite a Bit	Extremely
1	Luhaina	0	1	2	3	4
2	Anaphil (Lungam mak na)	0	1	2	3	4
3	Anamaktorlui chong wakhal a om mo	0	1	2	3	4
4	Muaina	0	1	2	3	4
5	Sangram munkanchun thasiat (Taksa manhui thanoum lui)	0	1	2	3	4
6	Mi tak sen wat	0	1	2	3	4
7	Miring ngai ning anna ma hul	0	1	2	3	4
8	Kapongnahi mingai jara k	0	1	2	3	4
9	Ningmil siat	0	1	2	3	4
10	Taksenlui jara ningdong na	0	1	2	3	4
11	Arak ah rangna lungthak na	0	1	2	3	4
12	Lungnat na ropnat na a om mo	0	1	2	3	4
13	Ramchik na lampuija chitna naneimo	0	1	2	3	4
14	Hongsoulna hongpongna	0	1	2	3	4
15	Ringkhua mantor na e ngai donna naneimo	0	1	2	3	4
16	Miring ngai jet luija natheija chong rasa na jet mo	0	1	2	3	4
17	Ananik na ommo	0	1	2	3	4

18	Mi rakip taksen jotmak tia nagai donmo	0	1	2	3	4
19	Woncham tuiral e om rem lui	0	1	2	3	4
20	Na mittui anaimo	0	1	2	3	4
21	Jak siat rat numei pasal modonna	0	1	2	3	4
22	Anna chur tia nangai donmo	0	1	2	3	4
23	Abibuija chitna neimo	0	1	2	3	4
24	Lungtel lungthak lunghang kankhap torluina e naneimo	0	1	2	3	4
25	Intenna natheija toulSouk nachit ratmo	0	1	2	3	4
26	Erakip hi kei jaramo	0	1	2	3	4
27	Kong natna	0	1	2	3	4
28	Chuan rakip hi akan kharpet	0	1	2	3	4
29	Lungriang na	0	1	2	3	4
30	Lungkhop torlui	0	1	2	3	4
31	Ningdong thatak na atam naneimo	0	1	2	3	4
32	Ningsatna neitorlui	0	1	2	3	4
33	Chitna atam naneimo	0	1	2	3	4
34	Nalungdo abeichek ah anna ngaipe lui e a ommo	0	1	2	3	4
35	Nalung ruk ngai don ngai mining anna jetpemo	0	1	2	3	4
36	Miring ngai ning najet ma uh/ lungsiat namu tor ma uh	0	1	2	3	4
37	Miring ngaihi kantopna jotmak, nadei ma uh	0	1	2	3	4
38	Chuan mankan chim narang aphot manlut tak ah thona	0	1	2	3	4
39	Lungkan nokna	0	1	2	3	4
40	Louksouk vonhuiluina	0	1	2	3	4
41	Minek ah kasin tia ngaidonna	0	1	2	3	4

42	Taksa natna	0	1	2	3	4
43	Mining anna enchak, naruijak anjek tia ngaidonna	0	1	2	3	4
44	Intheiluina	0	1	2	3	4
45	Nachuan thongai weisosom enkhirna nathomo	0	1	2	3	4
46	Ngirna mun ngaidon torlui	0	1	2	3	4
47	Train, Bus, Subway wa kanlonna chitna	0	1	2	3	4
48	Phuksan pongna	0	1	2	3	4
49	Ahip alum jet tor lui	0	1	2	3	4
50	Chit jara rammun chuan makna naneimo	0	1	2	3	4
51	Lungriang thareai na naneimo	0	1	2	3	4
52	Kut ke thina naneimo	0	1	2	3	4
53	Narolla akan ak mo	0	1	2	3	4
54	Nuk ah rang ngaidon tor lui	0	1	2	3	4
55	Lunghip riam ah ngaidon torlui	0	1	2	3	4
56	Naroung najanga pongna / soulna ommo	0	1	2	3	4
57	Lungwai thareaija na ommo	0	1	2	3	4
58	Nakut na ke athit mo	0	1	2	3	4
59	Thirang, kathijui tia nagai donna ommo	0	1	2	3	4
60	Narol adoukmo	0	1	2	3	4
61	Mining narui najar anjek kara nangaida mo	0	1	2	3	4
62	Mi ngai donna nikhaljel	0	1	2	3	4
63	Mivejot manpong rang nangai donmo	0	1	2	3	4
64	Arkhoung phawa nathuimo	0	1	2	3	4

65	Wei sosom puanrasuk, them reret tel reret nathomo	0	1	2	3	4
66	Mitkam natongmo najal kara	0	1	2	3	4
67	Phurpai vekhui rang wakhal nane ichakmo	0	1	2	3	4
68	Mining nakansiam puijot ma uh	0	1	2	3	4
69	Minek ah kanidet tia nangai donmo	0	1	2	3	4
70	Mitam kara omhuilui nanei mo	0	1	2	3	4
71	Chuan rakip ah ranak alut tia nangai donmo	0	1	2	3	4
72	Chitna le kanlai na naneimo	0	1	2	3	4
73	Mitam kara chakle nek huimak na naneimo	0	1	2	3	4
74	Mile chong rilsiat naratmo	0	1	2	3	4
75	Natheijak ah na om kara, thona jetluija na ommo	0	1	2	3	4
76	Nachuan tho nuk juija mining anna ma hok jotlui na a ommo	0	1	2	3	4
77	Mitak kara na om innom lungwaitha reaina naneimo	0	1	2	3	4
78	Lungkan nokna ongna ngirna jetuija na ommo	0	1	2	3	4
79	Nem na bui kani tia nangai donna ommo	0	1	2	3	4
80	Alui omsa phur ngai aramil akanthul tia nangai donmo	0	1	2	3	4
81	Khek rak ah phur peijel nathomo	0	1	2	3	4
82	Mitam kara kiwantha rng tia chitna naneimo	0	1	2	3	4
83	Kajotpe inko mingai ning anna easel rang ke tia nangai donmo	0	1	2	3	4

84	Numei / pasal le mun kanchun ranga nangai donna a ommo	0	1	2	3	4
85	Kachuuk mak jara lei anna tho rang asouk tia nangai donmo	0	1	2	3	4
86	Chuan tor thei narang akhella ranak pongna kanei jui tia nangai donmo	0	1	2	3	4
87	Katak akhella atok khat a omjui tia nangai donmo	0	1	2	3	4
88	Tukhat le om kankop torlui	0	1	2	3	4
89	Limkan sirna naneimo	0	1	2	3	4
90	Kalung ngaidon hi adikmak na a ommo tia ngaidona	0	1	2	3	4

The Symptom Checklist 90 Revised; SCL-90-R; Derogatis, 1983 (English)

Study _____

ID _____
Date ____/____/____

Symptom Checklist 90-R

Below is a list of problems and complaints that people sometimes have. Please read each one carefully and **enter the number** that best describes how much you were bothered by that problem during the past week.

Please enter only ONE.

FOR THE PAST WEEK, HOW MUCH WERE YOU BOTHERED BY:

	Not At All	A Little Bit	Moderately	Quite A Bit	Extremely
1. Headaches	0	1	2	3	4
2. Nervousness or shakiness inside	0	1	2	3	4
3. Unwanted thoughts, words, or ideas that won't leave your mind	0	1	2	3	4
4. Faintness or dizziness	0	1	2	3	4
5. Loss of sexual interest or pleasure	0	1	2	3	4
6. Feeling critical of others	0	1	2	3	4
7. The idea that someone else can control your thoughts	0	1	2	3	4
8. Feeling others are to blame for most of your troubles	0	1	2	3	4
9. Trouble remembering things	0	1	2	3	4
10. Worried about sloppiness or carelessness	0	1	2	3	4
11. Feeling easily annoyed or irritated	0	1	2	3	4
12. Pains in heart or chest	0	1	2	3	4
13. Feeling afraid in open spaces or on the streets	0	1	2	3	4
14. Feeling low in energy or slowed down	0	1	2	3	4
15. Thoughts of ending your life	0	1	2	3	4
16. Hearing words that others do not hear	0	1	2	3	4
17. Trembling	0	1	2	3	4
18. Feeling that most people cannot be trusted	0	1	2	3	4
19. Poor appetite	0	1	2	3	4
20. Crying easily	0	1	2	3	4

Study _____

ID _____
Date ____/____/____**FOR THE PAST WEEK, HOW MUCH WERE YOU BOTHERED BY:**

	Not At All	A Little Bit	Moderately	Quite A Bit	Extremely
21. Feeling shy or uneasy with the opposite sex	0	1	2	3	4
22. Feeling of being trapped or caught	0	1	2	3	4
23. Suddenly scared for no reason	0	1	2	3	4
24. Temper outbursts that you could not control	0	1	2	3	4
25. Feeling afraid to go out of your house alone	0	1	2	3	4
26. Blaming yourself for things	0	1	2	3	4
27. Pains in lower back	0	1	2	3	4
28. Feeling blocked in getting things done	0	1	2	3	4
29. Feeling lonely	0	1	2	3	4
30. Feeling blue	0	1	2	3	4
31. Worrying too much about things	0	1	2	3	4
32. Feeling no interest in things	0	1	2	3	4
33. Feeling fearful	0	1	2	3	4
34. Your feelings being easily hurt	0	1	2	3	4
35. Other people being aware of your private thoughts	0	1	2	3	4
36. Feeling others do not understand you or are unsympathetic	0	1	2	3	4
37. Feeling that people are unfriendly or dislike you	0	1	2	3	4
38. Having to do things very slowly to insure correctness	0	1	2	3	4
39. Heart pounding or racing	0	1	2	3	4
40. Nausea or upset stomach	0	1	2	3	4
41. Feeling inferior to others	0	1	2	3	4
42. Soreness of your muscles	0	1	2	3	4
43. Feeling that you are watched or talked about by others	0	1	2	3	4
44. Trouble falling asleep	0	1	2	3	4

Study _____

ID _____
Date ____/____/____**FOR THE PAST WEEK, HOW MUCH WERE YOU BOTHERED BY:**

	Not At All	A Little Bit	Moderately	Quite A Bit	Extremely
45. Having to check and double-check what you do	0	1	2	3	4
46. Difficulty making decisions	0	1	2	3	4
47. Feeling afraid to travel on buses, subways, or trains	0	1	2	3	4
48. Trouble getting your breath	0	1	2	3	4
49. Hot or cold spells	0	1	2	3	4
50. Having to avoid certain things, places, or activities because they frighten you	0	1	2	3	4
51. Your mind going blank	0	1	2	3	4
52. Numbness or tingling in parts of your body	0	1	2	3	4
53. A lump in your throat	0	1	2	3	4
54. Feeling hopeless about the future	0	1	2	3	4
55. Trouble concentrating	0	1	2	3	4
56. Feeling weak in parts of your body	0	1	2	3	4
57. Feeling tense or keyed up	0	1	2	3	4
58. Heavy feelings in your arms or legs	0	1	2	3	4
59. Thoughts of death or dying	0	1	2	3	4
60. Overeating	0	1	2	3	4
61. Feeling uneasy when people are watching or talking about you	0	1	2	3	4
62. Having thoughts that are not your own	0	1	2	3	4
63. Having urges to beat, injure, or harm someone	0	1	2	3	4
64. Awakening in the early morning	0	1	2	3	4
65. Having to repeat the same actions such as touching, counting, washing	0	1	2	3	4
66. Sleep that is restless or disturbed	0	1	2	3	4
67. Having urges to break or smash things	0	1	2	3	4
68. Having ideas or beliefs that others do not share	0	1	2	3	4

Study _____

ID _____
Date ____/____/____**FOR THE PAST WEEK, HOW MUCH WERE YOU BOTHERED BY:**

	Not At All	A Little Bit	Moderately	Quite A Bit	Extremely
69. Feeling very self-conscious with others	0	1	2	3	4
70. Feeling uneasy in crowds, such as shopping or at a movie	0	1	2	3	4
71. Feeling everything is an effort	0	1	2	3	4
72. Spells of terror or panic	0	1	2	3	4
73. Feeling uncomfortable about eating or drinking in public	0	1	2	3	4
74. Getting into frequent arguments	0	1	2	3	4
75. Feeling nervous when you are left alone	0	1	2	3	4
76. Others not giving you proper credit for your achievements	0	1	2	3	4
77. Feeling lonely even when you are with people	0	1	2	3	4
78. Feeling so restless you couldn't sit still	0	1	2	3	4
79. Feelings of worthlessness	0	1	2	3	4
80. Feeling that familiar things are strange or unreal	0	1	2	3	4
81. Shouting or throwing things	0	1	2	3	4
82. Feeling afraid you will faint in public	0	1	2	3	4
83. Feeling that people will take advantage of you if you let them	0	1	2	3	4
84. Having thoughts about sex that bother you a lot	0	1	2	3	4
85. The idea that you should be punished for your sins	0	1	2	3	4
86. Feeling pushed to get things done	0	1	2	3	4
87. The idea that something serious is wrong with your body	0	1	2	3	4
88. Never feeling close to another person	0	1	2	3	4
89. Feelings of guilt	0	1	2	3	4
90. The idea that something is wrong with your mind	0	1	2	3	4

Appendix – VII

The Psychological Well-Being Scale; Ryff &Keyes, 1995 (Aimol)

<p>Najot nahan riil ro lungsiat tak ah (asiin tenna alian na najot, ankhat tenna karuk khan): 1-sangtak ah jotlui, 2-aniam det ah jotlui, 3-jot lui, 4-ajot, 5-atam ajot, 6-asanga ajot ti ah athuai chong wahei ngai hi.</p>							
1	Kei I om chitmaking ka he ril jot ha, mitam in andei nimaknom	1	2	3	4	5	6
2	Ka om na ram hi kata k tiah ka ngai don	1	2	3	4	5	6
3	Kikan son narang chuan dei making	1	2	3	4	5	6
4	Mirakip in an nadei annalungsiat	1	2	3	4	5	6
5	Anikhua ah kahui, ahongrang nikhua rang khal making	1	2	3	4	5	6
6	Karing khua a isuak rakip ka enkara han ahui	1	2	3	4	5	6
7	Kein thorang kiti ha mi in angaidon le I om mari kan neimak	1	2	3	4	5	6
8	Aniracham chuan in nuai ana masul	1	2	3	4	5	6
9	Athar jet rang hi angai haning khella lian thei na ani	1	2	3	4	5	6
10	Mile mari kan nei hi ahui tam vaat jui	1	2	3	4	5	6
11	Karingkhua thojot om ah kiring ani	1	2	3	4	5	6
12	Han keihi lungam na kanei karing khua hi	1	2	3	4	5	6
13	Mi in imo annakhal ti ah tam ngaidonna kanei	1	2	3	4	5	6
14	Keihi mi ngai karra kan cha making	1	2	3	4	5	6
15	Kakhal karra tun khan pui latung tormaking	1	2	3	4	5	6
16	Kalung ariang ajarko mi tom jak jiang khodengtheina karil tor	1	2	3	4	5	6
17	My daily activities often seem trivial and unimportant to me.	1	2	3	4	5	6

18	Ka jet mingai tam in pui anvatung keinek ah	1	2	3	4	5	6
19	I tend to be influenced by people with strong opinions.	1	2	3	4	5	6
20	Kathorang suak tho han kathei	1	2	3	4	5	6
21	Mi khat ni ah hingan puitung na tam kavanei jui	1	2	3	4	5	6
22	Ka in sung mi ngai sap le hui ah kanbiakna ahui	1	2	3	4	5	6
23	Ringkhua ah kathojot ha thotorna theimaking	1	2	3	4	5	6
24	Kanunchan irakip tam kadei	1	2	3	4	5	6
25	Kangaidon ha lungamna kanei mingai le akan chun maknom	1	2	3	4	5	6
26	Tamlam ka kathorang chuan jar han kakhop	1	2	3	4	5	6
27	Athar mun ah om deimaking ajarko kanunchan thul jot making	1	2	3	4	5	6
28	Mi in pekjot lungdo ti ah anna khal	1	2	3	4	5	6
29	Kangaidon ha thotornarang atam ka kan huatna kadei	1	2	3	4	5	6
30	Karingkhua kathorakip jaraa lunghuimak	1	2	3	4	5	6
31	Akan chial na rui ah chong ril jot making	1	2	3	4	5	6
32	Karingkhua huina tho tam kamantat	1	2	3	4	5	6
33	Keirangko ringkhua hi han kanchu thei tormak	1	2	3	4	5	6
34	Mi ngai thacha hi puituk ah lakan tong making	1	2	3	4	5	6
35	Mingai ariam antam keiko nimaking	1	2	3	4	5	6
36	Keikarui jarra mikhan asat na kankhal making	1	2	3	4	5	6
37	Keiin katho hi kanninga kakan en mi ril aman	1	2	3	4	5	6

	khal lui ah						
38	Kadei nukjui ah ka in kasin	1	2	3	4	5	6
39	Akan thulrang anga kei tholai making	1	2	3	4	5	6
40	Kasap ngai ka thacha keiom anna thacha	1	2	3	4	5	6
41	Karingkhua ah thorang suak rakip katho jui ti ah ka khal kanninga	1	2	3	4	5	6
42	Karingkhua hi mingai le kakan en karra kei hi pui katung ti ah ka khal	1	2	3	4	5	6

Appendix – VIII

The Psychological Well-Being Scale; Ryff &Keyes, 1995 (English)

Please indicate your degree of agreement (using a score ranging from 1 - 6) on the six point scale: 1-very strongly disagree, 2-strongly disagree, 3-disagree, 4-agree, 5-strongly agree, 6-very strongly disagree to the following sentences.							
1	I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.	1	2	3	4	5	6
2	In general, I feel I am in charge of the situation in which I live.	1	2	3	4	5	6
3	I am not interested in activities that will expand by horizons.	1	2	3	4	5	6
4	Most people see me as loving and affectionate.	1	2	3	4	5	6
5	I live life one day at a time and don't really think about the future.	1	2	3	4	5	6
6	When I look at the story of my life, I am pleased with how things have turned out.	1	2	3	4	5	6
7	My decisions are not usually influenced by what everyone else is doing.	1	2	3	4	5	6
8	The demands of everyday life often get me down.	1	2	3	4	5	6
9	I think it is important to have new experiences that challenge how you think about yourself and the world	1	2	3	4	5	6
10	Maintaining close relationships has been difficult and frustrating for me.	1	2	3	4	5	6
11	I have a sense of direction and purpose in life.	1	2	3	4	5	6
12	In general, I feel confident and positive about myself.	1	2	3	4	5	6
13	I tend to worry about what other people think of me.	1	2	3	4	5	6
14	I do not fit very well with the people and the community around me.	1	2	3	4	5	6
15	When I think about it, I haven't really improved much as a person over the years.	1	2	3	4	5	6

16	I often feel lonely because I have few close friends with whom to share my concerns.	1	2	3	4	5	6
17	My daily activities often seem trivial and unimportant to me.	1	2	3	4	5	6
18	I feel like many of the people I know have gotten more out of life than I have.	1	2	3	4	5	6
19	I tend to be influenced by people with strong opinions.	1	2	3	4	5	6
20	I am quite good at managing the many responsibilities of my daily life.	1	2	3	4	5	6
21	I have a sense that I have developed a lot as a person over time.	1	2	3	4	5	6
22	I enjoy personal and mutual conversations with family members or friends.	1	2	3	4	5	6
23	I don't have a good sense of what it is I'm trying to accomplish in life.	1	2	3	4	5	6
24	I like most aspects of my personality.	1	2	3	4	5	6
25	I have confidence in my opinions, even if they are contrary to the general consensus.	1	2	3	4	5	6
26	I often feel overwhelmed by my responsibilities	1	2	3	4	5	6
27	I do not enjoy being in new situations that require me to change my old familiar ways of doing things.	1	2	3	4	5	6
28	People would describe me as a giving person, willing to share my time with others.	1	2	3	4	5	6
29	I enjoy making plans for the future and working to make them a reality.	1	2	3	4	5	6
30	In many ways, I feel disappointed about my achievements in life.	1	2	3	4	5	6
31	It's difficult for me to voice my own opinions on controversial matters.	1	2	3	4	5	6
32	I have difficulty arranging my life in a way that is	1	2	3	4	5	6

	satisfying to me.						
33	For me, life has been a continuous process of learning, changing and growth.	1	2	3	4	5	6
34	I have not experienced many warm and trusting relationships with others.	1	2	3	4	5	6
35	Some people wander aimlessly through life, but I am not one of them.	1	2	3	4	5	6
36	My attitude about myself is probably not as positive as most people feel about themselves.	1	2	3	4	5	6
37	I judge myself by what I think is important, not by the values of what others think is important.	1	2	3	4	5	6
38	I have been able to build a home and a lifestyle for myself that is much to my liking.	1	2	3	4	5	6
39	I gave up trying to make big improvements or changes in my life a long time ago.	1	2	3	4	5	6
40	I know that I can trust my friends, and they know they can trust me.	1	2	3	4	5	6
41	I sometimes feel as if I've done all there is to do in life.	1	2	3	4	5	6
42	When I compare myself to friends and acquaintances, it makes me feel good about who I am.	1	2	3	4	5	6

LIST OF ABBREVIATIONS

APA	American Psychological Association
ASD	Autism Spectrum Disorder
BDI	Beck Depression Inventory
CDC	Center for Disease Control and Prevention
CI	Cochlear Implant
COPA	Committee on Psychology and AIDS
DHH	Deaf and hard of hearing
dB	Decibel (unit of sound used in hearing test)
dBHL	Hearing level of a person
DSM	Diagnostic and Statistical Manual of Mental Disorders
GHQ	General Health Questionnaire
HA	Hearing Aids
NGO	Non-Governmental Organization
NSSO	National Sample Survey Organization
PWB	Psychological Well Being
PwDs	Persons with Disabilities
QOL	Quality of Life
RPwDs	Rights of Persons with Disabilities
SCL	Symptom checklist
SNHL	Sensorineural Hearing Loss
SWB	Subjective Well Being
WHO	World Health Organization

Appendix - X

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ABSTRACT

**MENTAL HEALTH PROBLEMS AND PSYCHOLOGICAL
WELL-BEING OF PEOPLE WITH HEARING DISABILITIES:
A STUDY AMONG AIMOL TRIBE OF MANIPUR**

**AN ABSTRACT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
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DEPARTMENT OF PSYCHOLOGY

SCHOOL OF SOCIAL SCIENCES

JUNE, 2023

**MENTAL HEALTH PROBLEMS AND PSYCHOLOGICAL WELL-BEING
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By

LANU WANBOY AIMOL

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SUBMITTED

**In partial fulfillment of the requirement of the degree of
Doctor of Philosophy in Psychology of Mizoram University, Tanhril,
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INTRODUCTION

Persons with hearing disabilities (hearing impaired) ever practically encounter individual and social problems which are not experienced by normal-hearing persons in their daily life. The extra burdens of their disabilities leave them at risk of developing mental health problems. Research evinced enormous physical and consequences mental problems, and have been well-accepted that people with physical disabilities are suffering from chronic individual and social problems in their everyday life which reduce their activity levels (Chwalisz & Vaux, 2000; Tate et al., 1994). Only a few evidence-based studies and limited coverage are currently accessible while a critical need for clinically sound and genuine research on deafness and how it affects mental health (Connolly, Rose, & Austen, 2006). A person with hearing impairment undergoes psychological, physical and social consequences of being a burden to the community with high prevalence worldwide (Stevens et al., 2013; Dalton et al., 2003).

Hearing loss is considered the most common sensory deficit in humans today. As per WHO estimates in India, there are approximately 63 million people, who are suffering from significant auditory impairment; this places the estimated prevalence at 6.3% of the Indian population (<https://nhm.gov.in>). The NSSO survey estimated around 291 persons per one lakh population is suffering from severe to profound hearing loss, and it amounts to a severe loss of productivity in both physical and economic. A large amount of the population suffers from milder degrees of hearing loss and unilateral (one-sided) hearing loss which were not detected or not recorded. (NSSO, 2001). The Census 2011 stated that 50,72,914 numbers of hearing-disabled people living in India; 2.21% of the total population are disabled, out of which 56% are males and 44% are females, and 69% of the disabled population resided in rural areas while the remaining 31% resided in urban areas (<https://enabled.in>, 2023).

Hearing Disability

According to the World Health Organization (<https://www.who.int>, 2023), a person who is not able to hear or has normal hearing thresholds of 20 dB or better in both ears is said to have hearing loss. It could be a different level of hearing disability

such as - mild, moderate, severe, or profound. It can affect one ear or both ears resulting in difficulty in hearing conversational speech.

Different terms related to hearing loss have been exchangeably used, and from culture to culture, the norms for labelling hearing loss seem different and also overlapped each other.

'Hard of hearing' is hearing loss ranging from mild to severe, and usually communicates through spoken language, and can be assisted with devices such as hearing aids, cochlear implants, and captioning.

'Deaf' refers to a person with profound hearing loss ranging from very little or no hearing and who could communicate with sign language.

'Disabling' or *'Hearing loss'*; is another issue with hearing loss that refers to any person who is greater than 35 decibels (dB) in a better hearing ear.

"Hard-of-hearing" and *"late-deafened"* are used to describe the deafness that occurs after the development of spoken language, slowly occurring with ageing, the result of prolonged noise exposure resulting in loss of functional hearing ability.

'Disabling Hearing Loss' (DHL) refers to bilateral moderate Hearing Loss (HL) or worse. The audiological criteria are HL in the better ear of >40 dB for adults and >30 dB for children (WHO, 2018).

'Hearing impaired' is used to describe people with any degree of hearing loss including those who are deaf, hard of hearing, and from mild to profound.

People living with hearing loss is also been used to refer exclusively to persons with long-term hearing impairments on not to harm their feelings and the rights of the person, especially human activists who have a preference for this term.

The 75th National Sample Survey (NSSO, 2018) report defined *'Hearing Disability'* as difficulty in hearing day-to-day conversational speech but excluded unilateral hearing impairment.

Decibel” and “Hertz” measurement

The ears receive sound waves, change them into signals, and send them to the brain; then analyze the signals, recognize them as sounds and interpret them as music, or noise. The volume or loudness of a sound is measured in decibels (dB) and was invented by Alexander Graham Bell (www.noisyplanet.nidcd.nih.gov, 2023). The highness or the pitch of a sound is measured in hertz (Hz), named after the German physicist Heinrich Rudolf Hertz; how many vibrations in per second e.g. 20 hertz means 20 vibrations per second. Humans have a hearing threshold of around 0 decibels, higher than this will hear as noise, above 90 dB can lead to chronic hearing damage.

The severity of hearing loss

The following list shows examples of the volume of familiar noises. Most people perceive a 10-decibel increase in volume to be “twice as loud”. WHO-proposed grades of hearing impairment and presumed functional consequences (Stevens et al., 2013) :

Grade and corresponding audiometric Performance in Quiet and Noise^b
ISO value^s

- | | |
|------------------------------------|---|
| ▪ No impairment, better than 20 dB | ▪ No or very slight hearing problems. |
| ▪ Mild 20–34 dB | ▪ No problems in quiet but may have real difficulty following conversation in noise. |
| ▪ Moderate 35–49 dB | ▪ May have difficulty in quiet hearing a normal voice and has difficulty with conversation in noise |
| ▪ Moderately severe 50–64 dB | ▪ Needs loud speech to hear in quiet and has great difficulty with noise. |
| ▪ Severe, 65–79 dB | ▪ In quiet, one can hear loud |

speech directly in one's ear, and, in noise, one has very great difficulty.

- Profound impairment, 80–94 dB
- Unable to hear and understand even a shouted voice whether in quiet or noise.

Hearing loss measured in decibels (dB) indicates functional disability but does not always precisely provide information about either the person's subjective experience of reduced ability to hear or their preferred language or cultural and social identity (Grønlie, 2005; Israelite et al., 2002; Hindley, 1997).

Among children diagnosed with congenital or childhood (≤ 8 years) hearing loss, moderate hearing loss has been reported in 34-50% of cases, severe hearing loss in 17-34% of 18 cases, and profound hearing loss in 20-30% of cases, depending on definitions and samples (Holzinger, Weishaupt, Fellingner, Beitel, & Fellingner, 2016; Wake, Poulakis, Hughes, Carey-Sargeant, & Rickards, 2005).

Signs of hearing loss

Some of the common signs of hearing loss are:

- a) Have trouble understanding what people are saying over the telephone
- b) Find it hard to follow conversations when two or more people are talking
- c) Often ask people to repeat what they are saying
- d) Need to turn up the TV volume so loud that others complain
- e) Have a problem understanding speech because of background noise
- f) Think that others seem to mumble
- g) Can't understand what's being said when children and people with higher-pitched
- h) voices speak to you.

Types of hearing loss:

Hearing loss comes in many forms, ranging from mild loss to total loss of hearing, and may broadly categorize as follow:

Sudden hearing loss- ‘Sudden hearing loss’ also known as ‘sudden sensorineural hearing loss’ is a rapid loss of hearing that happen to any person at all time and at once or short period span.

Age-related hearing loss- ‘Age-related hearing loss’ is also called ‘presbycusis’ and gradually appears as a person grows older.

Tinnitus- Tinnitus is described as ringing in the ears like roaring, clicking, hissing, or buzzing in one or both ears, and loud or soft, and a symptom of something wrong in the auditory system, and causes include - earwax blocking the ear canal, Noise-induced, sinus infections, heart or blood vessels problem, Ménière’s disease, brain tumour, hormonal changes in women, thyroid abnormalities as a sign of hearing loss (www.nidcd.nih.gov).

Conductive Hearing Loss (Problems lie in the outer & middle ear)- It concerns the sensory transferring of sound waves through the outer ear, to the inner ear; and the problems occur anywhere along the pathway may be at the outer ear, tympanic membrane (eardrum), and middle ear (ossicles). Conductive hearing loss occurs with sensorineural hearing loss and can be referred to as mixed hearing loss. The level of the severity and nature of the loss would require a different treatment such as surgical intervention or pharmaceuticals to partially and fully restore hearing acuity such as the normal hearing range. Permanent or chronic conductive hearing loss usually requires such as hearing aid devices to improve the detection of sound and speech perception (Hill-Feltham et al., 2021).

Sensorineural Hearing Loss (Problems lie in the inner ear): Sensorineural hearing loss (SNHL) is caused by damage in the inner structure of the ear or the auditory nerve. The common causes include exposure to loud noises (louder than 85 decibels), genetic factors, or the natural ageing process. It is a life-threatening condition that interferes with the ability to communicate if not properly managed.

Mixed Hearing Loss: Mixed hearing loss is a combination of conductive hearing loss and sensorineural hearing loss, sometimes occurring in combination with sensorineural hearing loss which is the reason for calling a mixed hearing loss. Damage in the outer and middle ear’s ability to conduct sound into the inner ear and the brain cause mild or moderate to severe hearing loss, and the factors include illness, drugs, genetic causes, head trauma, accumulation of earwax, fluids in the

middle ear, ear infections, perforated eardrums and/or malformation of the outer or middle ear.

Causes of Hearing loss and deafness:

Deaf and Hearing loss (DHL) are not the same and can be distinguished by several factors on the cause of the hearing loss, severity, age of onset, and cultural identity (Austen & Coleman, 2004; Israelite et al., 2002). Deafness and hearing loss may be caused by heredity and environmental factors. Nonhereditary includes damaged cochlea caused by intrauterine infection (cytomegalovirus, herpes simplex virus, toxoplasmosis, rubella and syphilis), medication or exposure to toxins. Hereditary (genetic) causes are congenital, progressive from birth or develop in childhood such as autosomal recessive (80%), autosomal dominant (15%), X-linked (2- 3%) or mitochondrial. Connexin deafness, and recessive mutations (Carlsson et al., 2012; Nance, Lim, & Dodson, 2006).

Hyperbilirubinemia, preterm childhood bacterial meningitis, ototoxic medicines, noise exposure, trauma, tumours, dysfunction of the central auditory nervous system, central auditory processing disorder, and auditory neuropathy/auditory neuropathy spectrum disorder (Smith & Gooi, 2014).

Some of the mentioned etiologies of hearing loss specifically intrauterine infections and bacterial meningitis a heightened risk for developing additional mental disorders, and prenatal exposure to rubella (Brown et al., 2000) are also associated with non-affective psychosis in adulthood; childhood meningitis is one of the factors which increase the risk of psychosis in adulthood (Gattaz et al., 2004a, 2004b) as children with meningitis are at greater risk for impairment in intellectual, academic and executive ability (Anderson et al., 2004). Studies evinced that long-term suffering from pneumococcal meningitis in childhood reduced cognitive function, and quality of life (Christie et al., 2011).

The Deaf and Hard of Hearing (DHH) population has a higher mental problems than the general community (Fellinger et al., 2012; de Graaf & Bijl, 2002; Carvill, 2001; Hindley, 1997; Kitson & Fry, 1990; Cooper, 1976), many factors can contribute as rightly mentioned in the developmental psychopathology and diathesis-stress model

(Monroe & Simons, 1991) that mental disorders result from individual vulnerability and also an environmental risk on the other (Sameroff, 2014; Cicchetti & Cohen, 2006; Horowitz, 1987). Some mental disorders like anxiety disorders, depressive disorders and disorders resulting from psychoactive substance use (Kessler et al., 2005; Kringlen, Torgersen, & Cramer, 2001). Several studies revealed mental disorder cannot be separated from the social context in which it occurs (Bronfenbrenner, 1977) and is viewed as a part of the dynamic relationship between the individual and his or her context (Sameroff, 2014).

Theories of Psychopathology :

Some important theories that explain the causes of psychopathology are as follows:

Biomedical Theory: The Medical model of psychopathology explain that the brain, neuroanatomy and related biochemicals work together to mediate psychological processes but any malfunctioning results in psychopathology, and the causes are believed physical/biological bases. Research findings on the neurotransmitter eg that low serotonin showed major psychological illnesses such as bipolar disorder and anorexia nervosa reduced levels of Serotonin in the brain (Cardwell et al., 2008). The model also suggested that psychological illness should be treated like any physical illness, and also can be treated with surgery or drugs as mental pathology is usually accompanied by physical pathology.

Psychodynamic Theory: Psychodynamic theory was created by Freud and evolved significantly over the years, and many theorists have contributed to it. They believed that human behaviour could be explained by intrapsychic processes, interpersonal patterns, and childhood experiences. The psychodynamic theory tries to explore a person's deeply rooted drives, needs and desires, and can be understood through four schools of thought: (i) Drive theory- behaviour is based on several drives including sex, self-preservation and destruction/aggression (death) drives; any pathological behaviour is a conflict between the drives and the superego or the ego. (ii) Ego psychology- a person's environment and reality are important for personality development; (iii) Object relations theory - behaviour based on object seeking, and relationships with significant others around them; (iv) Self-psychology - a person's

perception of themselves concerning with their social environment for a healthy sense of self and resilient; (v) Object relations focused on the unconscious issues of an individual's thoughts, emotions and behaviours (Mitchell & Black, 1995); a constant interplay (dynamic) of unconscious and an imbalance results in emotional disorder.

Behavioural Theory: This theory assumed all maladaptive behaviour is essentially acquired through one's environment and the main solution to psychological illness is aversion therapy where the stimulus that provokes the dysfunctional behaviour doesn't focus on the cause of the illness or problem; the individual and cultural differences be taken into account to regard the behaviour as a mental disorder; and the environment was solely responsible for all behaviour (Watson, 1913); and the mental illness and the persistence behaviours can be understood through learning theory.

The behavioural model explains that surroundings environment and life experiences mould the personality and functions of the person, and individuals learn behaviour patterns. The behavioural model of psychopathology states that psychological issues are the result of faulty learning and can be altered through learning. It examines behavioural patterns, influences, rewards, and punishments that made significant contributions to the field of psychology and continues to be a leading perspective regarding behaviour.

Cognitive Theory: The cognitive model focuses on cognitive distortions, dysfunctions in the thought processes and cognitive deficiencies in thinking and planning (Dobson & Kendall, 1993); the psychological disorders explain abnormality in irrational and negative thinking which determines all behaviour (Galton, 1883). The internal mental processes such as perception, attention, memory, and problem-solving explain the development of mental disorders; and the link between cognition and brain function especially in developing therapeutic techniques and interventions (Ellis, 1982). Mental disorder is created by errors of thinking and dysfunctional thinking in response to stimuli. Impaired modular processes are Amnesia, Aphasia, Alexia, Agraphia, Agnosia and Neglect (Trivedi, 2006).

Social Learning Theory: Social learning lies in diverse fields: social psychology, psychiatry, and experimental psychology (Hollands, 1961; Thibaut & Kelley, 1959; Skinner, 1957), and stem from the modelling, imitation and aggression studies among normal behaviour (Bandura (1961; 1963) conducted a series of experiments on social behaviours (aggression) and developed the social learning theory (Bandura, 1977) which postulates that learning takes place in a social framework with the interaction between the person in the social environment. The assumption of Social Learning Theory is (i) Learning through observation and acquiring new behaviour and knowledge by merely observing the model ; (ii) Reinforcement and punishment have indirect effects on behaviour and learning from the expectations about the potential consequences of future responses based on current reinforced or punished; (iii) Mediation processes influence behaviour that contributes to acquired new behaviour or not.

Humanistic Model explains psychological disorders caused by a faulty or interrupted development process which due to immaturity in social/emotional variety. The goal of humanistic therapy is to promote social/emotional maturity and growth. Maslow's hierarchy of needs was proposed in 1943 (Maslow, 1943). It intended to reflect the universal needs of society as its base, then proceed to more acquired emotions (Deckers, 2018). The hierarchy has been used to explain how effort and motivation are correlated in the context of human behaviour. Each of these individual levels contains a certain amount of internal sensation that must be met for an individual to complete their hierarchy, and the goal is to attain the last level of self-actualization (Freitas et al., 2011).

Diathesis-Stress Model: The diathesis-stress model explains a disorder as the result of an interaction between genetic, psychological, biological, or situational factors (Ingram & Luxton, 2005), a large range of differences exist among individuals' vulnerabilities to the development of a disorder (Ormel, et al., 2013) that interaction produces depression, anxiety, schizophrenia or other forms of disorders (Lazarus, 1993) in explaining the vulnerability of individuals who are more at risk for developing a disorder than others (Gazelle & Ladd, 2003). Specific stress triggers some forms of the disorder (Nolen-Hoeksema 2008) are the divorce of parents,

ongoing marital problems, death in the family, having a long-term illness (Oatley et al., 2006a), daily hassles, and so on. Psychological stress has been recognized as a significant factor in the development of psychopathology develops in individuals (Monroe & Simon, 1991).

Mental Health Problems and Hearing Loss

Hearing loss has a profound impact on physical and psychological functions. The present study will look at the selected psychological function as per the objectives of the study, the selected psychological functions are Somatization, Obsessive-compulsive, Interpersonal sensibility, Depression, Anxiety, Anger-hostility, Phobic-anxiety, Paranoid ideation and Psychoticism. Let us understand them one by one:

Somatization: Somatization is a bodily experience and communicating psychological distress as organic symptoms, and seeking medical help (Lipowski, 1988), and the pain is commonly expressed with physical symptoms but a psychiatric condition like anxiety. The term was introduced by Wilhelm Stekel in 1922 (Woolfolk & Allen, 2007) which the psychodynamic theory conceptualized as an ego defence in which deep-seated conflict causes the bodily disorder. The unconscious repressed emotions convert into somatic symptoms in the spectrum of symbolic communication (Sutker & Adams, 2001); and mostly focus on cardiovascular, gastrointestinal, and respiratory (Derogatis & Savitz, 2000). Different medical specialities have given different names such as somatic syndromes, for example, Irritable Bowel Syndrome, Premenstrual syndrome, Chronic pelvic pain, Fibromyalgia, Non-cardiac chest pain, Hyperventilation syndrome, Chronic (post-viral) fatigue syndrome and Atypical facial pain (Wessely et al., 1999).

The prevalence of somatic symptom disorders was significantly higher among participants with tinnitus than among participants without tinnitus at 40.4% whereas 26.9% among participants without tinnitus (Hackenberg et al., 2023). The prevalence ranges from 5 to 43% worldwide and from 9 to 28% in Europe (McCormack et al., 2016; Biswas et al., 2022). This prevalence appears that males are more commonly affected (Heller, 2003).

Somatization has high psychiatric co-morbidity with anxiety and depression, patients with somatoform disorders suffer from anxiety at 20.4% (Ritsner et al., 2000) and depressive disorders at 30% (Löwe et al., 2008). Women, older people, and widowed or divorced individuals reported somatic symptoms more than others at a significant level (Ritsner et al., 2000); and females reported more somatic symptoms at each level of emotional distress (Piccinelli & Simon, 1997). Somatization was more common among Urban residents than Rural residents, and greatest among women of separated, widowed, or divorce t (Swartz et al., 1989); and commonly occur in people with low socio-economic status and low educational level (Abdolmohammadi et al., 2018). There are limited studies on somatization and its risk factors (Heidari et al., 2017; Noorbala et al., 2017).

Obsessive-Compulsive Disorder: Obsessive-compulsive Disorder (OCD) is a mental and behavioural disorder, intrusive thoughts, obsession and feeling of the need to perform certain routines repeatedly to alleviate the distress caused by the obsession, which impairs general function (APA, 2013). It is thoughts, impulses, and actions that are experienced by an individual as irresistible an ego-alien or unwanted nature, and cognitive attenuation (Derogatis & Savitz, 2000). The exact cause of OCD is not known but genetic components and environmental factors such as a history of child abuse, stress-inducing events, and drug/ medical causes are among many (APA, 2013). Its symptoms are related to generalized anxiety disorder, major depressive disorder, eating disorders, tic disorders, and obsessive-compulsive personality disorder; and the common treatments used for OCD are psychotherapy such as cognitive behavioural therapy (CBT), pharmacotherapy such as antidepressants, or surgical procedures such as deep brain stimulation (Pittenger & Bloch, 2014).

The OCD prevalence is 3% of the population which is about 1 in 40 adults, and 1 in 100 children in the U.S. (Anxiety and Depression Association of America), and higher prevalence in females at 1.8% than males at 0.5% (Harvard, 2007). Psychopathological symptoms were more present in the tinnitus patients than in controls at 40% of OCD and had a strong correlation with anxiety, depression, and mental health quality of life (Geocze et al., 2018).

Interpersonal sensibility: It is feelings of personal inadequacy and inferiority in comparison with others, self-deprecation, uneasiness, and discomfort during interpersonal interactions (Derogatis & Savitz, 2000), and excessive awareness of both the behaviour and feelings of others (Masillo et al., 2012). Interpersonal sensitivity (emotional and social) is an assessment of others' abilities, states, and traits from nonverbal cues (Carney & Harrigan, 2003). Individuals having high interpersonal sensitivity are usually sensitive to interpersonal relationships, self-deficiencies, low self-esteem and feelings of insecurity (Mushtaq et al., 2017). It is the predictor of depressive symptoms (Huprich et al., 2016; Chahar et al., 2020; Vrshek-Schallhorn et al., 2015). The need theory states humans have an intrinsic need for social connection but unmet needs may affect the individual's behaviour and cognition affecting mental health (Baumeister et al., 2007).

Hearing loss is more prone to interpersonal sensitivity than subjects with no hearing problems (Monzani et al., 2008), and negative attitudes toward coworkers (Punch et al., 2004) affect social interaction and social relationships resulting in a feeling of rejected and isolated causing mental illness (Dammeyer., 2010). People with hearing loss have fewer friends than a normal hearing person with lower quality (Kouwenberg., 2013) due to misunderstandings and intolerance with fewer social relations (Bat-Chava et al., 2014). Women invest more time and effort in their interpersonal relationships than men (Kendler et al., 2001) and are more interpersonally sensitive (Hall et al., 2006).

Depression: It is a dysphonic mood and affect, withdrawal of life interest, lack of motivation, loss of vital energy, feelings of hopelessness, thoughts of suicide, and cognitive and somatic correlates of depression (Derogatis & Savitz, 2000). Hearing loss seems negatively affect communication between family members, health professionals and other significant persons and the patient, which may lead to social isolation and subsequent symptoms of depression (Linssen et al., 2013). There are several factors for depression: (i) Biochemistry, (ii) Genetics, (iii) Personality, and (iv) Environmental factors. Depression may categorize - as major depressive disorder, chronic depression, severe depression, classic depression, and unipolar depression.

Depression is a common illness with an estimated 3.8% of the population affected, including 5.0% among adults and 5.7% among adults older than 60 years worldwide (GHDE, 2021); and the prevalence rate for India is 4.50% in the year 2022 (<https://mindvoyage.in>). The prevalence rates of internalizing disorders in children who are hearing disabled are approximately 27% and that of externalizing disorders is 18% based on both clinical interviews and medical records (van Gent et al., 2007; Fellingner et al., 2009b). Hearing-impaired children reported more symptoms of depression than normally hearing peers (Theunissen et al., 2011). One-tenth of older adults with hearing loss have depression that affected their hearing, vision, cognition, and mobility (Xiang et al., 2020), and lifetime prevalence is at 26%; (Fellinger et al. 2009b). Tinnitus Hearing loss causes psychological pain that includes depression (Abbas et al., 2019) that reduces their quality of life (Ahmed et al., 2020). Research provided more internalizing symptoms among girls (Vostanis et al. 1997; van Eldik 2005; van Eldik et al. 2004; Dammeyer 2010) whereas boys experience more externalizing symptoms (Theunissen et al. 2013); and more symptoms of psychopathology in families with lower SES (Barker et al. 2009; Theunissen et al. 2014).

Anxiety: Paul Tillich describes anxiety as the state in which a being is aware of its possible nonbeing and suggests three categories: ontic- fate and death, moral -guilt and condemnation, and spiritual- emptiness and meaninglessness (Tillich, 1952). It is the state in which a being is aware of its possible nonbeing and suggests three categories: ontic- fate and death, moral -guilt and condemnation, and spiritual-emptiness and meaninglessness (Tillich, 1952). The common types of anxiety are; separation anxiety disorder, specific phobia, social phobia, agoraphobia, panic disorder, and generalized anxiety disorder (Beesdo et al., 2009). Anxiety is an emotion characterized by an unpleasant state of inner turmoil which includes feelings of dread over anticipation of events (Miceli & Castelfranchi, 2014; Davison, 2008), the anticipation of a future threat (Crocq, 2015), a feeling of uneasiness, worry, overreacting to a situation (Bouras & Holt, 2007), muscular tension (APA, 2013), restlessness, fatigue, inability to catch one's breath, tightness in the abdominal

region, nausea, and problems in concentration, withdraw from situations which have provoked anxiety in the past (Barker, 2003), and so on.

The prevalence of anxiety disorders in women is approximately twice as high as in men and is associated with an enormous economic burden on society (Marc-Antoine, 2015) and quality of life (Bruggemann et al., 2017). Research provided that adults with hearing loss show more signs of anxiety than normal hearing (Shoham et al., 2019).

The prevalence of anxiety disorders in women is approximately twice as high as in men; the common factors are childhood sexual abuse, chronic stressors, and genetic and neurobiological factors for the higher prevalence in women (Bandelow et al., 2015). Higher levels of anxiety disorder were also found in the urban area of Germany (Vassos et al., 2016). The prevalence of anxiety disorders was higher in urban and school students while the prevalence of all other psychiatric disorders was higher in rural school students (Pahwa et al., 2019).

Anger-hostility: Anger-hostility can include mistrust, cynicism, and negative beliefs and attributions concerning others (Smith, 2003). And classified under Type A behaviour along with (high) neuroticism and (low) agreeableness. Many hearing-impaired people internalize their frustrations, and increasing frustration breeds hostility and leads to antisocial behaviour, including violence (Vernon & Greenberg, 1999), and quality of life (Shen et al., 2006). The prevalence of hostility among the hearing impaired is not available which dictates the need for the present study.

Chronic frustration and brain damage are the common factors in violence and hostility with a high prevalence of learning disabilities among deaf and hearing-impaired people (Vernon & Greenberg, 1999) which is related to neurological and biochemical factors (Vernon & Greenberg, 1999). Hostility appears more in men and is largely explained by behavioural factors such as smoking and physical activity. Research evinced that hostility was greater in men than in women (Fava et al., 1995), and was greater among the subjects belonging to the urban areas than the subject belonging to the rural areas (Bisht & Sharma, 2021).

Phobic-anxiety: A phobia is an overwhelming fear of an object, place, situation, feeling or animal, more pronounced than fear, an exaggerated or unrealistic sense of

danger in a situation or object causing a feeling of unsteadiness, dizziness and lightheadedness, nausea, sweating, increased heart rate, palpitations, shortness of breath, trembling or shaking, and upset stomach. There is a variety of phobias classified into two main categories:

- (i) Specific or simple phobias - phobias centre around a particular object etc.
- (ii) Complex phobias - develop during adulthood, associated with a deep-rooted fear of a particular situation or circumstance which include agoraphobia etc.

The environmental or genetic influences have a significant role varying by condition, with social anxiety disorder and agoraphobia having around a 50% heritability rate (Penninx et al., 2021).

A lifetime prevalence of anxiety disorder of 11.1% and point prevalences of 15.4–31.3% for clinically significant anxiety symptoms in people with acquired hearing impairment. Anxiety prevalence was higher in hearing-impaired people than in the non-hearing-impaired group (Shoham et al., 2019). Higher cases were observed in females at 25.5% whereas 12.4% in males (Fredrikson et al., 1996).

Paranoid ideation: Paranoia is an instinct or thought process including anxiety and fear often accompanied by delusion and irrationality, beliefs of conspiracy threat towards oneself, making false accusations, and distrust of other people. A paranoid person usually believes an incident is intentional while most people view it as an accident or coincidence (Green et al., 2008).

Common symptoms of paranoia are attribution bias (Bentall & Taylor, 2006), feeling powerless, depressed, isolating oneself, relinquishing activities (Freeman et al., 2005), erotic, persecutory, litigious, and exalted (Deutsch & Fishman, 1963). Hearing impairment affects the presence of paranoia and persecutory delusions, sensory deprivation (Daniel et al., 2014), and misinterpretation of communication (Linszen et al., 2016). Research evinced a significant association between paranoid illness and bilateral conductive deafness with earlier age of onset, longer duration and greater (Cooper & Curry, 1976).

The research found a significantly higher level of paranoid psychosis in patients with conductive hearing loss and affective illness than in patients (Van-der-Werf et al., 2011). Theorists posited that delusions (Kraepelin, 1899/1989) as unpleasant emotions may lead to persecutory delusions (Freeman, Garety, Kuipers, Fowler, &

Bebbington, 2002; Zigler & Glick, 1988) such as depression, fear, worry, and anger (Freeman & Garety, 1999; Kennedy, Kemp, & Dyer, 1992).

Sociodemographic variables collectively explained the prevalence of paranoia ideation at 2.39% (Ellett et al., 2022) that lower age, low income and being male are the significant predictor of paranoia. Previous research studies also demonstrated that men have a higher level of paranoia (Freeman et al., 2011); general paranoia is associated with the urban dwelling (Ellett, Freeman, & Garety, 2008; van Os, 2004), lower socio-economic status and migrant status (Freeman et al., 2011).

Psychoticism: Psychoticism is one trait among the three traits used by Hans Eysenck in his theory of personality (Eysenck, 1993), which is divided into narrower traits such as impulsivity and sensation-seeking. Psychoticism is an unsocialized sensation-seeking (Zuckerman et al., 1991) caused by levels of dopamine (Lester, 1989), monoamine oxidase, beta-hydroxylase, cortisol, norepinephrine in cerebrospinal fluid.

Studies have evinced that hearing impairment is a risk factor for the development of psychosis or schizophrenia mostly among elderly populations (Almeida et al., 1995). Research findings provided that hearing impairment increases the risk for psychosis (Stefanis et al., 2006; van der Werf et al., 2007), more in young people (David et al. 1995; Thewissen et al. 2005). That sensory deprivation and mimicking in profound hearing loss induce feelings of paranoia and hallucinations (Leff, 1968), and social adversity may also mould the risk for psychosis (Boydell et al., 2004). Hearing impairment is one factor in the development of psychosis (Memon et al., 2017). The presence of persecutory delusions in patients with hearing-impaired individuals was first identified by Kraepelin in 1905 (Kraepelin,1914) which caused by sensory deprivation (Leff, 1968; Daniel et al., 2014), social differentiation (Hoffman, 2007), and misinterpretation of communication (Arlinger, 2003; Linszen et al., 2016). Research evinced a significantly higher level of paranoid psychosis in conductive hearing loss than in affective hearing loss (Cooper et al.,1974). Research suggests that hearing impairment is negatively associated with the mental health and quality of life of adults (Nordvik et al., 2018). The prevalence of psychoticism among the

hearing impaired is not available in the literature which specified the need for the present study.

Psychological Well-being

Psychological well-being (PWB) refers to an experience of positive emotions and feelings of happiness, and also refer to as subjective well-being (Diener, 2000). Researchers used a combination of indicators including self-esteem, life satisfaction, (Armsden & Greenberg, 1987), hopelessness, purpose in life (Shek, 1997), and hope (Ryzin et al., 2009). It seems that psychological well-being has been used as an umbrella term than a theoretical construct of well-being. Psychology defines well-being as optimal psychological functioning and experience in life (Ryan & Deci, 2001), and have two philosophical stances - hedonism which underscores being happy and eudaimonism which places more emphasis on being meaningful (Deci & Ryan, 2008).

Subjective well-being (SWB) is an individual's aspects of positive judgment, pleasant emotions and moods, and the absence of unpleasant emotions with negative moods (Diener et al. 1985). Life satisfaction is a cognitive judgment on own's quality of life (Diener et al. 1999).

Social Well-being is referred to it as "the appraisal of one's circumstance and functioning in society (Keyes,1998), dealing with issues such as (i) *Social integration*, (ii) *Social acceptance*, (iii) *Social contribution*, (iv) *Social actualization*, and (v) *Social Coherence*. The Indian approach to well-being refers to Maitri, Karuna, Mudita and Upeksha explaining relatedness, compassion, pleasant disposition and avoidance of conflict and negating the ego. Well-being is a mixture of survival, well-being, freedom and identity. The psychological and physical well-being of hearing-impaired children is less favourable, less confident, and less assertive (Annerose et al.,2007). Clausen (2003) found that more mental health problems among hard-of-hearing adults than in the general population. Hearing impairment negatively influences subjective well-being in older people (Scherer & Frisina, 1998), and mild to moderate hearing impairment had poorer well-being than normal hearing (Scherer & Frisina, 1998). A study reported that urban and rural

adults differed significantly on the autonomy of the dimensions of psychological well-being (Nepomuceno et al., 2015) whereas other researchers did not find a relationship between hearing impairment and well-being (Helvik et al., 2006)

Carol Ryff has broken down Psychological Well-being (Ryff et al., 2004; Ryff, 1989) into six dimensions which measure an individual's psychological well-being or happiness (Seifert, 2005) that can be attained by achieving a balance of challenging and rewarding life events (Dodge et al., 2012), and having six categories as under the following:

Self-acceptance: It is a positive attitude toward own self (Seifert, 2005). High in self-acceptance possesses a positive attitude toward the self, acknowledges and accepts multiple aspects of self including good and bad qualities, and feels positive even about past life. Low in self-acceptance feels dissatisfied with self, disappointed with what has occurred in a past life, troubled about certain personal qualities, and wishes to be different from what he or she is now. Self-acceptance begins with learning to accept self for being with own unique blend of strengths and weaknesses, history and experience, good and bad, and thoughts and feelings.

Children with hearing loss usually develop lower self-esteem than hearing peers based on differences in physical appearance because of wearing devices and physical differences related to a syndrome, and communication difficulties (Bat-Chava, 1993; Bat-Chava & Deignan., 2001; Huber, 2005; Weisel & Kamara., 2005). Good communication skills promote higher social competence and increased self-esteem (Leigh et al., 2009). Research evidence is not available for the prevalence, gender and ecological difference in self-acceptance among the hearing-impaired population.

Positive Relations with Others: It refers to engaging in meaningful relationships with others that include reciprocal empathy, intimacy, and affection (Seifert, 2005). High in Positive relations likely have warm, satisfying, trusting relationships with others; more concerned about the welfare of others; have strong empathy, affection, and intimacy; and have a good understanding of the give and take of human relationships.

Acquired hearing difficulties are high on the level of general psychological distress due in part to isolation, loneliness, and withdrawal (Meadow-Orlans, 1985) manifested in

heightened anxiety, depression, and sleep disturbance (Hallberg & Barrenas, 1995; Hetu et al., 1990) and significantly impact the family or significant others as well as the individual (Schein et al., 2001). Communication stress, social isolation, and unsupportive supervisors are among the difficulties encountered by many deaf and hard-of-hearing workers (Schroedel & Geyer, 2000). No research funding is available for the prevalence, gender and ecological difference among the hearing impaired which highlighted the need for the present study

Autonomy: It indicates the independent behaviour of a person under social pressure (Seifert, 2005). ***High*** autonomy is characterized by self-determining and independence; the ability to resist social pressures including thinking and acting in certain ways; the ability to regulate own behaviour from within; and the ability to evaluate self by personal standards. Hearing loss limits communication with evident negative consequences in daily life (Olusanya et al., 2014) resulting in higher unemployment rates than the rest of the population. The limitations in hearing and understanding speech lead to fatigue and more recovery time (Kramer et al., 2006; Nachtegaal et al., 2009), and face significant physical and social challenges that contribute to a low level of autonomy with associated anxiety, depression, cognitive deficits and dementia (Lin et al., 2013).

Environmental Mastery: An effective use of opportunities and a sense of mastery in managing environmental factors, managing everyday affairs and benefit to personal needs (Seifert, 2005). ***High*** environmental mastery is a sense of mastery and competence in managing their environment; the ability to control a complex array of external activities; make effective use of their surrounding opportunities; able choose or create contexts suitable to personal needs and values. ***Low*** in environmental mastery has difficulty managing everyday affairs; feels unable to change or improve surrounding context; is unaware of surrounding opportunities; lacks a sense of control over the external world. Hearing impairment is associated with poorer physical functioning (Viljanen et al., 2009) and slower walking speed (Li et al., 2012) which reduced environmental mastery in those individuals with hearing loss (Loprinzi, 2013).

Purpose in Life: It is a strong goal orientation and conviction holding life meaning (Seifert, 2005). ***High*** in purpose life is having a goal in life and a sense of directedness; feeling the meaning to present and past life; holding beliefs of life purpose; and having aims and objectives for a living. Several studies demonstrated that Presbycusis harms the

quality of life and psychological well-being due to social isolation, depression, anxiety, and even cognitive decline have been reported in people with hearing loss (Dalton et al., 2003; Gates & Mills, 2005; Heine & Browning, 2002).

Personal Growth: It refers to the individual develop with new experiences, and recognising improvement in behaviour over time (Seifert, 2005). High in personal growth is a feeling of continuing development, seeing self as growing and expanding, being open for new experiences; realizing own potential; observing improvement in self and behaviour over time, and changing to reflect more self-knowledge and effectiveness. Research revealed that the worrisome problem of hearing loss was a 44 % high school dropout rate among deaf students (Blanchfield, Feldman, Dunbar, & Gardner, 2001) compared with 19 % in the general population. Many employers have a higher resistance to hiring deaf individuals which added disadvantages to the unskilled deaf worker (Buchanan,1999).

An individual with hearing loss is most likely to have trouble hearing including background noise in the classroom that affects communication ability and access to education (Clarcq & Walter, 1997-1998) resulting 44 % high school dropout rate among deaf students (Blanchfield, Feldman, Dunbar, & Gardner, 2001) compared with a general population rate of 19 %. In addition to employer resistance to hiring deaf individuals as the work functions have disadvantages for the unskilled deaf worker (Buchanan,1999) resulting in lower educational achievement for the deaf.

Hearing loss is one of the important issues in public health, globally; 5% of the world's population has a hearing loss disability (Eide et al., 2016), estimated to increase by at least 900 million people in 2050 (WHO, 2016), and approximately one-third of people over 65 years of age were having hearing loss (Eide et al., 2016) who were mostly from low and middle-income countries. It is recognised as the third source of long-term disability in the Global Burden of Disease (Hasson et al., 2013). Hearing Loss is usually accompanied by stigmatizing and heavily expensive assistive technology of hearing aids and cochlear implants (Blazer & Tucci, 2019; Powell et al., 2019). Negative consequences of hearing loss include impairment in education, family life, and employment hardship in life (Newman & Newman, 2016) that

affects their personal growth in the social world (Newman & Newman, 2016). People diagnosed with hearing loss at a young age exhibit more emotional distress and feeling of stigmatization (Baldrige & Kulkarni, 2017).

Hearing loss invites anxiety, stress, fatigue, social alienation, low social-emotional well-being (Arslan et al., 2018), adverse attitudes and actions (Newman & Newman, 2016) with the consequences of financial tension, low social-emotional well-being, intensified feeling to access audiologists (Kochkin, 1993; Powell, Jacobs, Noble et al., 2019). Their impaired communication limits their social interactions, diminishing social roles (Kramer et al., 2002), leading to depression and emotional disturbance (Kramer et al., 2002) and associated with a decrease in social interactions and psychosocial well-being (Andersson et al., 1996).

People in rural settings having hearing loss do not have facilities or no access to hearing healthcare due to long distance to a hearing healthcare professional including financial constraints, lack of awareness of having a hearing loss, lack of time to see a hearing healthcare provider, and not knowing how to access a provider (Hay-McCutcheon et al., 2021), a shortage of hearing healthcare specialists in rural regions (Windmill & Freeman, 2013), lack of diagnostic and intervention services in rural resulting high risk of delayed treatment (Brach et al., 2003) that serve as barriers to rural adults compared with urban adults

Psychopathological Comorbidities

Research showed an increased risk of hearing impairment in all psychosis outcomes such as hallucinations, delusions, psychotic symptoms and delirium, and early onset of schizophrenia. Sensory deprivation caused anxiety, depression, dementia, suicidality, and psychosis is higher in hearing people who have sensory deprivation than in the general population (Sahoo et al., 2022). Deaf or profoundly hearing-impaired children who have cochlear implants have lower levels of psychopathological symptoms than children with moderate or severe hearing loss who have hearing aids (Theunissen et al., 2015).

Children with early-onset hearing loss experience more social isolation, low self-esteem and depression (Fellinger et al., 2008; Margaret & Andrew, 2015; Johannes et

al., 2012) than late onset. Adult with hearing loss has difficulty in verbal communication which causes social exclusion, risk of development of cognitive and functional impairments (Johannes et al., 2012), and are more vulnerable to neglect, discrimination or violence (Shoham et al., 2018). Age-related hearing loss is associated with sadness, feelings of low self-worth or guilt, a loss of interest in daily activities, and disturbed appetite or sleeps that decrease concentration (Lawrence et al., 2020).

Studies found an increased prevalence of mental health including depression and anxiety in the hearing-loss population (Theunissen et al., 2014). Depression, anxiety, paranoid ideation and interpersonal sensitivity are more among older people with hearing loss than those with normal hearing (Johannes et L., 2012). Hearing loss in high-income countries has more experienced emotional, and social loneliness (Contrera et al., 2017; Pronk et al., 2014), poor cognitive function (Jayakody et al., 2018; Loughrey et al., 2018), depressive symptoms (Hörnsten et al., 2016; Luanaigh et al., 2010; Sophia et al., 2015), anxiety symptoms (Øhre et al., 2011; Gomaa et al., 2014; Contrera et al., 2017) and other psychiatric conditions (Cole et al., 2002; Nirmalasari et al., 2016; Davies et al., 2017; Park et al., 2018). Hearing loss contributes to almost 10% of dementia (Livingston et al., 2017), and the association between mental conditions and physical/neurological conditions of hearing loss are usually caused by biological or environmental factors resulting in mental health consequences.

Patients with hearing loss have significantly higher anxiety than normal hearing people (Cetin et al 2010) and also evinced that 11% lifetime prevalence of 'unspecified anxiety disorder' in people with hearing loss whereas 5.4% in the controls group (Hsu et al., 2016). A greater levels of anxiety and stress among patients with severe or profound hearing loss than in the general population (Per-Inge et al., 2016).

The behavioural and emotional disorders among children with hearing loss outcomes include hallucinations, delusions and other psychotic symptoms (Blazer & Tucci, 2019). Researchers found a significant association between hearing loss and self-reported psychotic symptoms at the age of 19 years (Stefanis et al., 2016), mostly among young hearing loss those who are using a hearing aid (Boxtel et al., 2007).

Older people with hearing loss had higher levels of insomnia (Werngren et al., 2003), impulse control disorders, pervasive developmental disorders, substance use disorders, mild mental retardation and personality disorders (Landsberger & Diaz, 2010). Hearing loss has difficulty dealing with the presence of background noise in their workplace (Hetu, 1994; Garcia et al., 1999).

An even larger percentage of the population suffers from milder degrees of hearing loss and unilateral (one-sided) hearing loss (<https://nhm.gov.in>). In a clinical-audiological study of 6,674 Aimol children in 24 tribal villages in the hills of Manipur state of India with a total population of 18,565, the incidence of deafness is found to be 6.62%. More so, the incidence of conductive deafness was at 98.64%, and sensorineural was at 1.35% among the hearing loss in this state (Das et al., 1999). The present study operated in this Aimol community for further in-depth study.

It may be mentioned that utmost action is required to curtail the growing number of people with hearing loss to improve their quality of life (Wilson et al., 2017) while the progress is still limited and much slower in low- and middle-income countries due to insufficient local capacity to scale up interventions at all levels of health-care delivery coupled with the shortcoming of global initiative and funding support for hearing health care. The screening of hearing loss at birth is available in most high-income countries but in low and middle-income countries is not treated as necessary and is still not available. So, it is much-needed low-cost hearing technology for early detection and rehabilitation of people with a hearing impairment which can outweigh their overall long-term economic benefits in society (Huddle et al., 2017).

Considering all the previous studies on hearing loss, it is suggested that an investigation into the mental health problems and psychological well-being of hearing-loss individuals in the target population might help lessen the level of psychological symptoms. It is very crucial to improve public understanding of this disease and its pathophysiology in an attempt to minimize its progression. Furthermore, it is of great importance to hearing rehabilitation services and learning

coping strategies that can have a positive impact on the quality of life of individuals with hearing loss.

Objectives of the study:

The study aims to have an in-depth study of the people living with hearing impairment by comparing them with normal hearing persons and also to look at any ecological differences among the targeted population. The following objectives were framed for the present study.

- 1) To examine the significant difference between Hearing disabled and Normal hearing ability samples on Mental Health Problems and psychological well-being.
- 2) To examine the significant difference between Rural hearing- disabled samples and urban hearing- disabled samples on Mental Health Problems and psychological well-being.
- 3) To examine the significant difference between Female hearing disabled and Male hearing disabled samples on Mental Health Problems and psychological well-being.
- 4) To examine the significant relationship between Mental Health Problems and psychological well-being among the samples.
- 5) To examine the significant independent effect of 'hearing disability', 'ecology' and 'gender' on Mental Health Problems and psychological well-being.
- 6) To examine any significant interaction effect of 'hearing disability and ecology', 'hearing disability and gender', 'ecology and gender' and 'hearing disability and ecology and gender' on Mental Health Problems and psychological wellbeing.

Hypotheses of the study:

The present study has set-forth alternative hypotheses based on the objectives of the study, which are:

- 1) Hearing- disabled samples will score higher on Mental Health Problems and will score lower on psychological well-being than normal hearing samples.
- 2) Urban hearing- disabled samples will score higher on Mental Health Problems but score lower on psychological well-being than Rural hearing-impaired samples.
- 3) Female hearing- disabled samples will have higher scores on psychopathological symptoms but lower scores on psychological well-being than Male hearing- disabled samples.
- 4) The psychological problem will have a significant negative relationship with Psychological well-being.
- 5) 'Hearing disability, 'Ecology', and 'Gender' will have a significant independent effect on Mental Health Problems and psychological well-being.
- 6) The 'Hearing disability x Ecology', 'Hearing disability x Gender', 'Ecology x Gender' and 'Hearing disability x Ecology x Gender' will have significant interaction effects on Mental Health Problems and psychological well-being.

Methods and procedures

Samples: To meet the objectives of the study set forth, an attempt was made to get the identified hearing impaired/hearing impaired from the registered NGOs and Hospitals for the Aimol community run by the government of Manipur State. From the population of the Aimol hearing impaired, 200 samples were drawn randomly which comprises 100 hearing impaired to represent Aimol hearing impaired regardless of type, level of hearing, the onset of hearing, and demographic profiles

except for the ecological background, equal representation of ecology (50 rural and 50 urban areas) and gender representation (50 males and 50 females- no transgender were included as a proper record not available). The hearing-impaired samples were identified by a medical team of the Government of Manipur as well as identified through the assessment of hearing camps done by qualified audiologists using audiometers under registered NGOs of the government of Manipur. To be compared with the hearing impaired /hearing loss samples, 100 Aimol samples having the same distribution of demographic profiles on the ground of age, sex, education, monthly income of the family, size of a sibling, and same locality with hearing impaired samples were selected from the general population who are with normal hearing samples with an equal representation of ecology (50 rural and 50 urban areas) and gender (50 male and 50 female samples) using demographic profiles constructed for the study. This socio-demographic profile was utilized to cross-check the true representation of the subject as laid down in the objectives of the study.

Inclusion criteria for the sample selection:

1) control group:

- a) A person from the Aimol community,
- b) who was identified as having hearing disabilities,
- c) age range between 18 to 69 years of age
- d) communicable with verbal or sign language
- e) Only those who give consent for willingness to participate in the study

2) experimental group:

- a) A person belongs to the Aimol community
- b) Who was identified as not having a hearing disability or normal hearing
- c) Age range between 18 to 69 years of age
- d) Communicable with verbal not by sign language
- e) Only those who give consent for willingness to participate in the study

2) Exclusion criteria for sample selection

- a) A person does not belong to the Aimol community
- b) Having a severe physical and mental health
- c) Below 18 years and above 69 years
- d) Not belong to female and male or identify themselves as having a third gender category
- e) Not included any who does not give consent for participation in the study

Sample Characteristics

The samples were collected from the Aimol community settled in Manipur state. Samples of hearing loss/impairment were collected from the list of identified persons who suffer from hearing impairment/loss of hearing by the Government of Manipur and recognized NOGs (recognized by the government of India and the state of Manipur Government). The sample of the study had an equal representation of hearing impaired and normal hearing, urban and rural hearing impaired, and female and male hearing impaired was randomly selected from the list of registered Hearing loss/hearing impaired from the list of hospitals and NGOs run and recognized by the Manipur State Government whereas the normal hearing samples were selected with an aimed of well-match of the hearing impaired samples following purposive sampling procedure on the ground of demographic profiles such as locality, gender, age, education, monthly income, family size and sibling size to keep away from extraneous variable influence. The sample characteristics of the study were an age range from 18 to 68 years as well as a distribution of different age groups (18-28 years =18%; 29-38 years =19%; 39-48 years =20%; 49-58 years =21%; 59-68 years =22%); distribution of education level range between class II to graduate level (below class X=30%; matriculation to graduate BA=33%; graduate; below MA=37%); monthly income distribution is range from Rs. 1000 to 3lakh (below Rs. 5000=38%; 5001-10000=27%; 10001 – 50000=19%; 100001-200000=11%; 200001-above=5%); the size of family range from 3 to 13 family members (below 7 member-44%; 5-8 members=38%; 9-13 members =18%); the size of sibling range from 2- 11 siblings (2-5=49%; 5-8=37%; 9-12=14%) served as the sample.

Psychological Scale used: The present study used two standardized psychological tests to ascertain the psychological function of the samples, as follows:

1. *The Symptom Checklist 90 Revised (SCL-90-R; Derogatis, 1983)* The Symptom Checklist 90 Revised (SCL-90-R) is a self-report screening to measure general psychiatric symptomatology. It consists of 90 items and has six subscales which measure different dimensions such as somatization, obsessive-compulsive, depression, anxiety, phobic anxiety, anger/hostility, interpersonal sensitivity, paranoid ideation, and psychoticism. Therefore, it is designed for a broad spectrum of populations and can be used to screen psychiatric disorders ranging from non-patient “normal” populations to medical patients with psychiatric disorders, and useful in quantifying a variety of emotional reactions in adults but should not administer to delirious, mentally retarded, and floridly psychotic patients (Derogatis 1983); the psychometric property was checked and found its applicability for the original scale which was α : 0.72 y 0.97 (Derogatis, 2012).

2. *The Psychological Well-Being Scale (Ryff &Keyes, 1995)*. Psychological Well-Being was assessed using the Scales of Psychological Well-Being (Ryff &Keyes 1995) which conceptualize psychological well-being (PWB) as having the following six subscales: (i) Self-acceptance- a positive attitude toward one’s self, life, and past, including good and bad qualities, (ii) Positive relations with others - warm, satisfying, trusting relationships, (iii) Autonomy - independence, ability to resist social pressures and follow own standards, (iv) Environmental mastery- competence in managing life’s demands, (v) Purpose in life -goals and direction, sense of meaning, (vi) Personal growth - view of self as growing and developing, openness to new experiences. The PWB scales measured these six elements and are available in several lengths. The 54-item version, with nine items per scale, was used in the present study. This version has been shown to have good psychometric properties (Sewell et al. 2004) with internal consistency ($\alpha > .70$) and life control ($\alpha = .69$). We used a total score derived by summing the elements of well-being. Ryff’s (1989a) original paper revealed that the six scales' internal consistency (α) ranged from .73 to .86. Further, the reliability of the test was checked over six weeks, and returned coefficients ranging from .88 to .81 confirming it was sufficiently reliable

(Ryff, 1989). Psychological well-being (PWB) represents “the achievement of one’s full psychological potential” (Carr, 2004) and is multi-dimensional.

3. *The demographic profiles (Lanu, 20017)*. It was constructed by the researcher to know about the details of demographic details of the sample/subject like the type of hearing disability as per the record of the professional, the level or severity of the hearing, the onset of hearing, age, time of onset, gender, family size, family income, size of a sibling, rank in the sibling, any hearing aide used, permanent address, and so on.

Design: A Correlational design was used to compare between Hearing impaired and Normal hearing, Urban hearing impaired and Rural hearing impaired, and Female hearing impaired and Male hearing impaired on psychopathological symptoms and psychological well-being. A factorial design, 2x 2x2 was also used to find out the independent and interaction effects of ‘Hearing impairment (hearing impaired and normal hearing)’, ‘Ecology (rural and urban hearing impaired)’ and ‘Gender (female and male hearing impaired)’ on psychopathological symptoms and psychological well-being.

Procedure: Firstly the researcher collected the selected psychological tests and translated them into the Aimol language with due care to the methodological obligation. The pilot study was conducted with 80 Aimol community samples consisting of 40 hearing loss identified by registered NGOs and 40 normal hearing who has equal demographic profiles with the experimental group- the hearing impaired, and the reliability between the original and translated scale was α : 0.78 which showed its applicability for the targeted population. Secondly, the hearing-disabled samples were collected from the list of people living with hearing impairment maintained by the Hospital run by the Manipur Government and Centres run by the Registered NGOs (hearing assessment camps organised) of the Government of Manipur. Thirdly, the normal samples were collected who are identified as matching the representatives of the people living with hearing impairment on age, sex, ecology, hearing ability and so on to prevent confounding variables. Fourthly, necessary permission and consent were taken from significant

persons (participants, authorities, etc) before conducting the scales on the subjects. Fifthly, the purpose of the study and necessary instructions given are informed to the subject, any doubts were clarified, and the subject was informed that participation in the study was fully voluntary bases and can leave at any time of their own choice, assurance was given for keeping the confidentiality of any information of the personal details; then after only those who give consent were included for psychological evaluation. The instruction as per the manual of the tests and Ethical principles of psychologists and Code of conduct (APA, 2002) was followed in the administration of the test. The administration was done in individual conditions where noise disturbance or any other possible distraction was not there. The conduction of the psychological scales was done in the individual condition. All the administration of the psychological test was strictly followed as per the instruction of the prescribed manual for each scale used in the present research study. The scoring was done as per the manual of the test scales.

Results and Discussion

The present study, “The mental health problems and psychological well-being among hearing impaired in Aimol tribe of Manipur State” as per design, demonstrated the mental health problems and psychological well-being among the hearing impaired of the Aimol tribe along with ecological and gender differences in Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Anger/hostility, Phobic Anxiety, Paranoid Ideation, Psychoticism, self-acceptance, positive relations with, autonomy, environmental mastery, purpose in life, personal growth.

To meet the objectives of the study, 200 Aimol samples comprised of 100 Aimol hearing impaired and 100 Aimol normal hearing with equal representation of ‘hearing impaired’ (Hearing impaired and normal hearing samples), ‘Ecology’ (rural and urban hearing impaired samples), ‘Gender’ (male and female hearing impaired samples), age range between 18 to 68 years of age, selected through random sampling procedure. The hearing-impaired samples were identified by a medical team of the government of Manipur as well as organised assessment of hearing

camps by qualified audiologists using audiometers. The normal hearing samples were selected to well-match with the hearing impaired samples on demographic profiles such as age, sex, education, monthly income of the family, and size of a sibling from the general population. *The Symptom Checklist 90 Revised (SCL-90-R*; Derogatis, 1983) was used to measure the mental health problems of the sample, *and the Psychological Well-Being (Ryff &Keyes 1995)* was used to measure the psychological well-being of the samples. The Correlational design was used to compare the two levels of hearing impairment (Hearing impaired and Normal hearing samples), two levels of ecologies (100 Rural and 100 Urban hearing impaired samples), and two levels of genders (100 Males and 100 Females hearing impaired samples) which initiated eight cells. The administration of the psychological test was strictly conducted following the instruction given in the test manuals and the Ethical principles of psychologists for research - the Code of Conduct (APA, 2002).

Checking of missing raw data and outlier

Firstly the raw was ensured for any missing and extreme outliers which can adulterate the results of the study. The researcher carefully checked out to find any missing or incomplete data from the datasheet as no missing or extreme outliers not presented, and then decided to go forward for further statistical analysis

Psychometric adequacy of the Psychological scales

The two psychological tests employed were standardized tests which were originally constructed for other populations, and need to be checked for appropriateness for the targeted population. Though it was done with a pilot study for methodological refinement, the reliability, homogeneity and normality were checked on all the subscales of the two tests to find their applicability for the selected population under study. Psychometric analyses of the scales and subscales were done by using Microsoft Office Excel 2013 and Statistical Package for the Social Sciences (SPSS 20).

Reliability checking for the psychological tests: Results showed the internal consistency of the scales was calculated using Cronbach's coefficient alpha (Cronbach, 1951) and all the scales of the nine subscales of the Symptoms Check List - Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Anger/hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism separately and found the reliability ranged from (α) .60 to .83 and put together in Table-1; and also for the six subscales of psychological well-being - Self-acceptance, Positive relations with others, Autonomy, Environmental mastery, Purpose in life, and Personal growth and found the reliability range from (α) .67 to .89 which were showed in the Table-2. Results evinced that the reliabilities of the two tests were trustworthy to the targeted population, and further analysis was done in the study.

The internal consistency of the scales was calculated using Cronbach's coefficient alpha (Cronbach, 1951) and all the scales and subscales were found to be reliable as shown in Table -1 that includes Somatization ($\alpha = .68$), Obsessive-Compulsive ($\alpha = .71$), Interpersonal Sensitivity ($\alpha = .82$), Depression ($\alpha = .73$), Anxiety ($\alpha = .78$), Anger/hostility ($\alpha = .81$), Phobic Anxiety ($\alpha = .77$), Paranoid Ideation ($\alpha = .73$), and Psychoticism ($\alpha = .88$); and reliability for the subscales of psychological well-being includes - Self-acceptance ($\alpha = .89$), Positive relations with others ($\alpha = .85$), Autonomy ($\alpha = .84$), Environmental mastery ($\alpha = .79$), Purpose in life ($\alpha = .81$), and Personal Growth ($\alpha = .67$). The item-total coefficient of correlation and interscale relationships, and reliability coefficients (Cronbach Alpha) over all the levels of analyses ensured the strength of the psychological tool used and the consistency of subject scores which permit parametric statistics may be used for further analysis

Homogeneity checking for the psychological tests: Levene's Test of Equality of variances tests were employed for checking the homogeneity of variances which is the inferential statistic used to assess the equality of variances for a variable calculated for two or more groups. **Table-1** shows Levene's Test of Equality of variances for each sub-scale of the Mental health problems and Psychological well-being showing all the scores were greater than .05, which were non-significant levels

and indicating the assumptions of homogeneity of variance were met which suggested that parametric statistics may be employed for further analysis.

Normality: The descriptive statistics were calculated to examine the normality of the subscales of Mental health problems and Psychological well-being for the whole sample. The descriptive statistics consisting of Standard Deviation, Skewness and Kurtosis demonstrated that data were normally distributed as shown in Table -1 for the subscales of the psychopathological symptoms, and in Table-2 for the subscales of the psychological well-being which suggested that parametric statistics may be used for further analysis.

Objective- 1: To examine any significant difference between Hearing disabled samples and Normal hearing ability samples on mental health problems and psychological well-being. It was expected that the Hearing impaired samples will score higher on mental health problems and will score lower on psychological well-being than normal hearing samples (*hypothesis -1*).

An Independent t-test was computed between the (i) Hearing disabled and Normal hearing, (ii) Rural hearing Disabled and Urban hearing-disabled groups, and (iii) Female hearing disabled and Male hearing disabled to test the first hypothesis of the study; and the results for mental health problems and the psychological well-being subscales were given s in Tables- 3 to 8.

Hearing Disabled and Normal Hearing groups on mental health problems

(i) Hearing disabled scored higher than Normal hearing in all mental health problems with significant differences in Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Phobic Anxiety, Paranoid Ideation, and Psychoticism but not significant in Anger hostility as shown in Table-3.

Results of the study have supported the *hypothesis-1* as it was expected that Hearing impaired samples will score higher on mental health problems than normal hearing samples; and the findings were also in line with the findings of the earlier studies that

hearing impaired are higher than normal hearing on somatization (Mehboob et al., 2019; Nachtegaal et al., 2009), OCD due to musical obsession triggered by the absence of external acoustic stimuli (Kraemer et al., 2005) as repetitive musical sounds in the absence of an external source (Williamson et al., 2014; Liikkanen et al., 2013), interpersonal sensitivity (Baraldi et al., 2007), more symptoms of depression (Theunissen et al., 2011), high anxiety (Shoham, Lewis, Favarato, & Cooper, 2019), higher hostility (Baraldi et al., 2007), phobic anxiety and social phobia (Eleuteri et al., 2010), higher paranoid psychosis (Cooper et al., 1974), and psychotic symptoms (van der Werf et al., 2011) than normal hearing subjects.

Hearing disabled and Normal hearing on Psychological wellbeing

The result depicted that Normal Hearing scored higher than the Hearing impaired group in all psychological well-being measures with significant difference levels in Self-acceptance, Positive relations with others, Autonomy, Environmental Mastery, Purpose in Life, and Personal Growth as presented in Table-4. The results of the present study evinced that the Hearing impairment scored lower than the Normal hearing subject on psychological well-being as expected, which affirmed the ***hypothesis-1***, and was also in line with the earlier findings that hearing impairment had poorer well-being than normal hearing (Scherer & Frisina (1998), lower in self-acceptance (Keilmann et al., 2007 (Matud et al., 2019), less impulsive and socially immature (Myklebust, 1996), lower self-esteem (Bat-Chava, 1993), loss of autonomy (Lin et al., 2013), poorer physical functioning (Reuben et al., 1999; Viljanen et al., 2009) but a higher realization of purpose in life (Springer et al., 2011) as some researcher also a contradictory finding as no differences based on hearing status (Kluwin, 1999).

Objectives-2: To examine any significant difference between Rural hearing-disabled samples and Urban hearing-impaired samples on mental health problems and psychological well-being. The second

Rural hearing disabled and Urban hearing disabled in mental health problems.

Results of the study provided that the rural hearing-impaired group scored higher than the Urban hearing impaired group with a significant difference in OCD, Interpersonal sensitivity, Anxiety Phobic Anxiety, and Paranoid Ideation; the rural hearing-impaired group scored lower than the Urban hearing impaired group on Somatization, Depression, Anger/hostility, and Psychoticism as displayed in Table-5.

Results of the study accepted the hypothesis-2 as expected that Urban hearing-impaired samples scored higher on mental health problems but score lower on psychological well-being than Rural hearing impaired; and also confirmed the earlier findings which found a significant difference between urban residents and rural residents (Swartz et al., 1989), higher anxiety disorders were found in the urban area (Vassos et al., 2016), greater paranoid ideation among rural (Freeman et al., 2011), greater Anger/hostility among the subjects of urban areas than the subject of rural areas (Bisht & Sharma, 2021) may be the poor rural subject are more susceptibility to paranoia due to low socioeconomic status (Mirowsky & Ross, 1983), and gender seems one of the independent significant predictors to affective psychosis as a higher prevalence of affective disorders found in women (Blazer et al., 1994).

Rural hearing disabled and Urban hearing disabled on Psychological well-being

Results revealed that the Urban hearing-impaired group scored higher than the Rural hearing-impaired group with a significant level of Purpose in Life, and Personal Growth but not a significant level of Autonomy; and the Rural-urban hearing groups scored lower than the urban hearing-impaired groups with significant differences in Self-acceptance, Positive relations with others, and Environmental Mastery as presented in Table-6.

Results revealed that the Urban hearing-impaired group scored higher than the Rural hearing-impaired group with a significant level on Purpose in Life, and Personal Growth but not significant in Autonomy, and the Rural hearing groups scored lower than the urban hearing-impaired groups with a significant difference in Self-acceptance, Positive relations with others, and Environmental Mastery as presented in Table-6.

The results of the study mostly accepted *hypothesis -2* and also authenticated earlier studies that rural samples showed higher self-acceptance than rural samples (Devaramane & Yenagi, 2019) and a high level of positive relations than urban samples (Devaramane & Yenagi, 2019) while the urban sample showed a higher score on autonomy than rural samples (Devaramane & Yenagi, 2019) and environmental mastery than rural samples (Devaramane & Yenagi, 2019) due to their higher level of income and socioeconomic status which seems promotes the positive relations and personal growth (Devaramane & Yenagi, 2019).

Objective-3: To examine any significant difference between Female hearing-disabled samples and Male hearing- disabled samples on mental health problems and psychological well-being

To determine the significant difference between the Female hearing disabled and Male hearing disabled samples on mental health problems and psychological well-being, a t-test was computed.

Male hearing disabled and Female hearing disabled on mental health problems

Results demonstrated Male hearing impaired scored higher than the Female hearing impaired with a significant difference in Somatization, and Psychoticism whereas, on OCD, Inter-personal sensitivity, Depression, Anxiety, Phobic Anxiety, Paranoid Ideation scored lower than the Females hearing impaired group; and male hearing impaired scored higher on Anger/hostility but not at a significant level as presented in Table-7.

The results also revealed higher scores found in women than males on mental health problems and lower scores on psychological well-being which pave the way for accepting *hypothesis no-3*. Additionally, the results have got supporting research evinced that a high prevalence of hearing impairment among women (Ritsner et al., 2000), more obsessions (Tükel et al., 2004), more interpersonally sensitivity (Hall, Murphy, & Mast, 2006), higher major depression (Andrade et al., 2003) with a prevalence of anxiety twice as higher than men (Bandelow et al., 2015), higher fear

anxiety (Fredrikson et al., 1996), higher levels of paranoia (Ciarrochi, Hynes, & Crittenden, 2005) but lower hostility/Anger/hostility (Fava et al., 1995) than men whereas some findings provided a higher level of paranoia (Freeman et al., 2011) and psychoticism in male (Lynn & Martin, 1997).

Male hearing disabled and Female hearing disabled on psychological well-being

Results evinced that the Male hearing disabled scored higher than the Females hearing group with a significant level of Positive relations with others, Autonomy, and Environmental Mastery whereas the Male hearing impaired scored lower than the female hearing impaired group but not significant on Self-acceptance, Purpose in Life and Personal Growth.

The results revealed that Rural hearing disabled samples scored higher on mental health problems but scored lower on psychological well-being than urban hearing-impaired samples, which accepted ***hypothesis no -3*** of the study, and the findings also supported the earlier research findings that rural areas had a higher prevalence of psychological well-being (Brennan-Jones et al., 2015), have higher self-acceptance (Swartz et al., 1989), have a higher level of positive relations (Devaramane & Yenagi, 2019) than urban hearing impaired. Some findings depicted that urban has a higher score in autonomy (Devaramane & Yenagi, 2019), environmental mastery (Devaramane & Yenagi, 2019), positive relations and purpose in life (Devaramane & Yenagi, 2019) than rural hearing impaired samples. Overall scores demonstrated higher psychological well-being in hearing impaired from rural areas than in hearing impaired from urban areas (Oguzturk. 2008).

The results demonstrated Female hearing- disabled samples showed higher scores on psychopathological symptoms but lower scores on psychological well-being than Male hearing-impaired samples which accepted the ***hypothesis-3***, and the finding showed consistency with earlier findings that a high prevalence among women than male hearing impaired (Ritsner et al., 2000), more prone to contamination of obsessions (Tükel et al., 2004), more interpersonally sensitive (Hall, Murphy, & Mast, 2006), higher rates of major depression (Andrade et al., 2003), approximately

twice higher than men with higher prevalence of anxiety (Bandelow et al., 2015), a low hostility/Anger/hostility than men (Fava et al., 1995), higher fear anxiety (Fredrikson et al., 1996), higher levels of paranoia than male (Ciarrochi, Hynes, & Crittenden, 2005; Freeman et al., 2011), and psychoticism (Lynn & Martin, 1997) than female.

Objective-4: To examine the significant relationship between mental health problems and psychological well-being among the samples.

To examine any significant relationship between the dependents (among the subscales of Mental health problems and psychological well-being) was computed by employing Pearson's correlation, and the results were provided in Table-9.

Results of the present study presented in Table-9 showed a significant negative relationship between the mental health problems and psychological well-being subscales, in almost all of the sub-scales.

(i) Results demonstrated that Somatization had a positive significant relationship with OCD, Interpersonal sensitivity, Depression, Anxiety, Phobic Anxiety, Paranoia ideation, and Psychoticism whereas negative significant relationship with Self-acceptance, Positive relation, Autonomy, Environmental mastery, and Purpose in life.

(ii) OCD showed a positive relationship with Interpersonal sensitivity, Depression, Anxiety, Phobic Anxiety, Paranoia ideation, and Psychoticism but a negative significant relationship with Self-acceptance, Positive relation, Autonomy, Environmental mastery, and Purpose in life but no significance in anger hostility and personal growth.

(iii) Interpersonal sensitivity demonstrated a positive significant relationship with Depression, Anxiety, Anger hostility, Phobic Anxiety, Paranoia ideation, and Psychoticism, while a negative significant relationship with Self-acceptance, Positive relation, Autonomy, Environmental mastery, and Purpose in life.

(iv) Depression revealed a significant relationship with Anxiety, anger hostility, Phobic Anxiety, Paranoia ideation, and Psychoticism whereas a negative significant relationship with Self-acceptance, Positive relation, Autonomy, Environmental mastery, and Purpose in life.

(v) Anxiety showed a positive significant relationship with anger hostility, Phobic Anxiety, Paranoia ideation, and Psychoticism, while a negative significant relationship with Self-acceptance, Positive relation, Autonomy, Environmental mastery, and Purpose in life.

(vi) Anger hostility demonstrated a significant relationship with Phobic Anxiety, Paranoia ideation, and Psychoticism, but a negative significant relationship with Purpose in life.

(vii) Phobic Anxiety evinced a significant relationship with Paranoia ideation, Psychoticism while a negative relationship with Self-acceptance, Positive relation, Autonomy, Environmental mastery, and Purpose in life, Personal growth.

(viii) Paranoia ideation showed a positive significant relationship with Psychoticism but a negative relationship with Self-acceptance, Positive relation, Autonomy, Environmental mastery, Purpose in life, and personal growth.

(ix) Psychoticism revealed a negative significant relationship with Self-acceptance, Positive relation, Autonomy, Environmental mastery, and Purpose in life, personal growth.

(x) Self-acceptance substantiated Positive relations, Autonomy, Environmental mastery, and Purpose in life.

(xi) Positive relations showed a negative relationship with Autonomy, Environmental mastery, and Purpose in life.

(xii) Autonomy demonstrated a negative significant relationship with Environmental mastery, and Purpose in life.

(xiii) Environmental mastery had a positive significant relationship with Purpose in life.

The results of the present study got supports some earlier research findings that there was a strong correlation between anxiety, depression, obsession and mental health and quality of life (Geocze et al., 2018); hearing loss invites anxiety, stress, and fatigue (Arslan et al., 2018), higher paranoia, phobic anxiety, paranoid ideation, social phobia related to hard concern for self-appearance and interpersonal insensitivity (Eleuteri et al., 2010); depression, anxiety, paranoid ideation and interpersonal sensitivity appeared together in old aged hearing loss (Johannes et al., 2012); interpersonal sensitivity predicts depression (Chahar et al., 2020; Boyce, Parker, Barnett, Cooney, & Smith, 1991), social anxiety disorder (Harb, Heimberg, Fresco, Schneier, & Liebowitz, 2002; Kumari, Sudhir, & Mariamma, 2012), anxiety (Vidyanidhi & Sudhir, 2009), and psychotic symptoms (Masillo et al., 2012). Interpersonal sensitivity leads to depression, anxiety, and social phobia (Boyce et al., 1991; Harb et al., 2002), and in reverse a high hostility person prone to more interpersonal conflict (Siegler et al., 2003), more negative, and fewer positive interpersonal interactions (Brondolo et al., 2003). High hostility predicted a high interpersonal conflict (Siegler et al., 2003) with low social functioning (Eleuteri et al., 2010), adults with hearing loss tend to exhibit more symptoms of depression, anxiety, psychological distress, and emotional sensitivity as compared to people with normal hearing (Iwagami et al., 2019).

The results evinced that the negative relationship between the subscales of mental health problems and psychological well-being confirmed the *hypothesis no-4*, and the findings were also in line with the earlier findings which mentioned that Hearing impaired persons are more prone to depression, anxiety, interpersonal sensitivity, hostility (Monzani et al., 2008), problems and sociological maladjustment (Tidball, 1990), restless, distractible, hypersensitive, aggressive, lack of perseverance, self-

conscious, suggestible, lack self-confidence, temper outbursts, demanding, and so on (Dharitri & Murthy,1990). Several findings demonstrated that Mental health problems negatively correlated with psychological well- (Casullo & Castro, 2002), Mexico (Pérez et al, 2010), and those who perceive more psychological well-being showed lower symptoms of psychopathology (Winefield et al., 2012).

Objective-5: Hearing Disability’, ‘Ecology’, and ‘Gender’ will have a significant independent effect on mental health problems and psychological well-being.

To determine the independent effect of ‘hearing disability’, ‘ecology’ and ‘gender’ by computing ANOVA (oneway) were presented in Table-10.

The results in Table-10 evinced that: (i) the ‘hearing disability’ showed a significant independent effect on Somatization was 25% with significance at 01 level, OCD was 43% with significance at .01 levels, Interpersonal Sensitivity was 33% with significance at .01 levels, Depression was 23% with significance at .01 levels, Anxiety was 16% with significance at .01 levels, Phobic Anxiety was 24 % with significance at .01 levels, Paranoid Ideation was 39 % with significance at .01 levels, and Psychoticism was 38 % with significance at .01 levels, not significant on anger/hostility;

(ii) the ‘ecology’ had a significant independent effect on Somatization was 21% with significance at 01 level, OCD was 5% with significance at .05 levels, Interpersonal Sensitivity was 5% with significance at .05 levels, Depression was 6% with significance at .05 levels, Anxiety was 8% with significance at .05 levels, Phobic Anxiety was 10% with significance at .05 levels, Paranoid Ideation was 37 % with significance at .01 levels, and Psychoticism was 5% with significance at .05 levels; and

(iii) the ‘gender’ obtained a significant effect on Somatization was 8% with significance at .05 levels, OCD was 17% with significance at .01 levels, Depression was 29% with significance at .05 levels, Anxiety was 29% with significance at .01 levels, Phobic Anxiety was 35% with significance at .01 levels, Paranoid Ideation was 27% with significance at .01 levels, and Psychoticism was 34 % with significance at .01 levels but not significant on Interpersonal Sensitivity.

The results demonstrated the acceptability of hypothesis no -5 that 'hearing impairment', 'ecology and', and 'gender' showed an independent effect on the subscales of mental health problems and psychological well-being among the hearing-impaired subjects. In this line, several studies also found that the hearing impaired persons are more prone to depression, anxiety, interpersonal sensitivity, hostility (Monzani et al., 2008), problems and sociological maladjustment (Tidball, 1990), restlessness, distractible, hypersensitive, Anger/ hostility, lack of perseverance, self-conscious, suggestible, lack self-confidence, temper outbursts, and demanding (Dharitri & Murthy,1990).

The results of the study showed a significant difference between rural and urban hearing impaired which also confirmed the second hypothesis; earlier research findings were also in line with the present study that higher anxiety disorders were found in the urban area than in rural areas (Vassos et al., 2016), Anger/hostility/hostility was greater among the subjects of urban areas than rural areas (Bisht & Sharma, 2021), the rural were more susceptibility to paranoia than urban (Mirowsky & Ross, 1983), and greater paranoid ideation among rural with lower socio-economic status (Freeman et al., 2011).

Independent effect of 'hearing disability', 'gender' and 'ecology' on psychological well-being:

The result in Table-11 provided the Independent effect of 'hearing impairment'. 'ecology', and 'gender' on *psychological well-being* such as Self-acceptance, Positive relations with others, Autonomy, Environmental mastery, Purpose in life, and Personal growth by employing the ANOVA (oneway).

Results in Table-11 presented that:

(i) The 'hearing impairment' showed a significant independent effect on Self-acceptance was 27% with a significance of .01 levels, Positive relations with others were at 35% with a significance of .35 levels, Autonomy was at 5% with a significance of .05 levels, Environmental mastery was 36% with significance at .01 levels, Purpose in life was

33% with significance at .01 levels, and Personal growth was 32 % with significance at .01 levels;

(ii) the 'ecology' had a significant independent effect on Self-acceptance was 16% with significance at .01 levels, Positive relations with others was 1% with significance at .01 levels, Autonomy was 11% with significance at .05 levels, Environmental mastery was 17% with significance at .01 levels, Purpose in life was 16% with significance at .01 levels, and Personal growth was 37 % with significance at .01 levels; and

(iii) 'Gender' obtained a significant effect on Self-acceptance was 57%, Positive relations with others were 5%, Autonomy was 6%, Environmental mastery was 8%, and Purpose in life was 10%, but not significant on Personal growth.

The overall findings demonstrated that the 'Hearing Impairment', 'Ecology', and 'Gender' had a significant independent effect on mental health problems and psychological well-being which supported hypothesis no -5 of the study, and highlighted the independent effect of 'hearing impairment', 'ecology', and 'gender' on mental health problems among hearing-impaired people but it needs more research and more in-depth study

The results were also in line with earlier research findings that hearing impairment affects poorer well-being (Scherer & Frisina,1998), lower self-acceptance (Keilmann et al., 2007; Matud et al., 2019), social immaturity (Myklebust, 1996), lower self-esteem (Bat-Chava, 1993), lower autonomy (Lin et al., 2013), poorer physical functioning (Reuben et al., 1999; Viljanen et al., 2009), and a higher realization of purpose in life and purpose in life (Springer et al., 2011).

Some research findings demonstrated that better psychological well-being (Brennan-Jones et al., 2015) and a higher level of positive relations (Devaramane & Yenagi, 2019) in rural samples a higher autonomy (Devaramane & Yenagi, 2019) and higher environmental mastery (Devaramane & Yenagi, 2019) among the urban subject. The

overall scores of psychological well-being showed a higher in subjects from rural than those from urban areas (Oguzturk. 2008).

Several studies provided gender independent effect on psychological well-being that men score higher than women in self-acceptance (Matud et al., 2019) and positive relations with others (Matud et al., 2019) while others found that women score higher than men (Karasawa et al., 2011) on personal growth, and autonomy (García-Castilla et al., 2020). Some findings mentioned that men scored higher than women in autonomy (Matud et al., 2019) and more environmental mastery (Li et al., 2015), and personal growth and positive relations with others (Matud et al., 2019). Such contradicting findings invite more research to find the uniqueness in individuals, society, areas, and cultures on mental health problems and psychological well-being to know their uniqueness or their specific problems.

Objective-6: To examine any significant interaction effect of ‘hearing disability x ecology’, ‘hearing disability x gender’, and ‘hearing disability x ecology x gender’ on mental health problems and psychological wellbeing.

To ascertain the interaction effect, two-way ANOVA and three-way ANOVA were used for the interaction of (i) hearing disability and ecology’, (ii) hearing disability and gender’, (iii) ‘ecology and gender’ (two-way ANOVA), and (iv) hearing disability X ecology X gender’ (three-way ANOVA) on Somatization, OCD, Interpersonal Sensitivity, Depression, Anxiety, Anger/hostility, Phobic Anxiety, Paranoid Ideation, Psychotism (Psychopathological symptoms) for the whole sample.

The findings were presented under the following sequence:

(i) Hearing disability and ecology together showed a significant effect on Somatization was 34% with significance at 01 level, OCD was 31% with significance at .01 levels, Interpersonal Sensitivity was 22% with significance at .01 levels, Depression was 21% with significance at .01 levels, Anxiety was 19% with significance at .01 levels, Phobic Anxiety was 20 % with significance at .01 levels,

Paranoid Ideation was 25 % with significance at .01 levels, and Psychoticism was 21 % with significance at .01 levels but not significant on Anger/ hostility;

(ii) Hearing disability and gender' demonstrated a significant effect on Somatization was 21% with significance at 01 levels, OCD was 30% with significance at .01 levels, Interpersonal Sensitivity was 21% with significance at .01 levels, Depression was 20% with significance at .01 levels, Anxiety was 13% with significance at .01 levels, Phobic Anxiety was 22 % with significance at .01 levels, Paranoid Ideation was 18 % with significance at .01 levels, and Psychoticism was 27 % with significance at .01 levels, not significant on Anger/ hostility; and

(iii) The 'ecology and gender' interaction effect was calculated using the two-way ANOVA) showing a significant interaction effect on Somatization was 26% with significance at 01 level, OCD was 20% with significance at .01 levels, Interpersonal Sensitivity was 23% with significance at .01 levels, Depression was 14% with a significance at .05 levels, Anxiety was 5% with significance at .05 levels, Anger/ hostility was 19% with significance at .01 levels, Phobic Anxiety was 32 % with significance at .01 levels, Paranoid Ideation was 26 % with significance at .01 levels, and Psychoticism was 16 % with significance at .01 levels; and

(iv) The significant interaction effect of 'Hearing disability X ecology X gender' was ascertained using the three-way ANOVA, and the results exposed that Somatization was 9% with significance at 01 level, OCD was 28% with significance at .01 levels, Interpersonal Sensitivity was 22% with significance at .01 levels, Depression was 12% with significance at .05 levels, Anxiety was 28% with significance at .05 levels, Anger/hostility was 21% with significance at .01 levels, Phobic Anxiety was 26 % with significance at .01 levels, Paranoid Ideation was 15 % with significance at .01 levels, and Psychoticism was 17 % with significance at .01 levels.

The interaction effect 'hearing disability, ecology and gender' on psychological well-being:

The interaction effect of 'hearing disability and ecology', 'hearing disability and gender', 'ecology and gender' (two-way ANOVA), and 'Hearing disability X

ecology X gender' (three-way ANOVA) on Self-acceptance, Positive relations with others. Autonomy, Environmental mastery, Purpose in life, and Personal growth were computed and demonstrated as follows:

(i) the significant interaction effect of 'hearing impdisability x ecology' on Self-acceptance was 28% with significance at .01 levels, Positive relations with others were 30% significance at .01 levels, Autonomy was 19% with significance at .01 levels, Environmental mastery was 16% with significance at .01 levels, Purpose in life was 20% with significance at .01 levels, and Personal growth was 15 % with significance at .01 levels;

(ii) the significant interaction effect of 'hearing disability x gender' on Self-acceptance was 18% with significance at .01 levels, Positive relations with others was 22% with significance at .01 levels, Autonomy was 19% with significance at .01 levels, Environmental mastery was 18% with significance at .01 levels, Purpose in life was 23% with significance at .01 levels, and Personal growth was 21 % with significance at .01 levels;

(iii) the significant interaction effect of 'ecology x gender' on Self-acceptance was 26% with significance at .01 levels, Positive relations with others were 19% with significance at .01 levels, Autonomy at 18% at .01 levels, Environmental mastery was 22% with significance at .01 levels, Purpose in life was 25% with significance at .01 levels, and Personal growth was 24 % with significance at .01 levels; and

(iv) The significant interaction effect of 'Hearing disability x ecology x gender' on Self-acceptance was 29% with significance at .01 levels, Positive relations with others was 24% with significance at .01 levels, Autonomy was 21% with significance at .01 levels, Environmental mastery was 26% with significance at .01 levels, Purpose in life was 27 % with significance at .01 levels, and Personal growth was 24 % with significance at .01 levels.

The results accepted the *hypothesis-6* and also confirmed the earlier findings that hearing loss persons have greater difficulty in listening and communicating with others resulting in poor mental health (Muazzam & Jabeen, 2016), ageing considerably contributes to increased risk of morbidity, poor self-perceived health, poor psychological well-being, low self-efficacy and happiness (Ejaz et al., 2020) which linked to anxiety, cognitive decline and lower health-related quality of life (Mehboob et al., 2019). Hearing impaired constantly coping stressful situations in their daily life (Muazzam & Ahmad, 2017) resulting in more vulnerable to depression, decreased well-being, emotional sensitivity and Anger/hostility (Cosh et al., 2019), anxiety, psychological distress, emotional sensitivity (Iwagami et al., 2019). Consequently, hearing loss experiences diminished self-esteem and psychological well-being (Dean et al., 2017). All mentioned findings explained that hearing impairment, ecology, and gender are interacting and the outcomes seriously promote mental health problems and decreased psychological well-being of an individual.

The results of the present study highlighted the independent effect of ecology that urban and rural groups were significantly different on all subscales of mental health problems and psychological well-being which affirmed *hypothesis –no 6*. Several studies provided the same trend of findings that hearing impairment is more prevalent in rural areas than in urban areas (Brennan-Jones et al., 2015) caused by poverty (Brennan-Jones et al., 2015) with the consequences of difficulty in getting medical specialists and hearing aids (Stephen et al., 2017). People living in rural areas very much required additional attention to the prevention of the impact of hearing impairment on physical and emotion (Hay-McCutcheon, & Cheimario, 2018). Most studies focus on either rural or urban populations, more important is to find their difference in the impact of hearing loss, diagnosis and treatment (Hixon et al., 2016), as such more efforts are needed to investigate the differences for suggesting appropriate prevention and treatment.

The study also provided that the ‘Hearing impairment x Ecology’, ‘Hearing impairment x Gender’, ‘ Ecology x Gender’ and ‘Hearing impairment x Ecology x Gender’ will have significant interaction effects on mental health problems and

psychological well-being which confirms *hypothesis no- 6*, and the finding of the study was in the line with the available literature that men and women differ in physiology and/or hormonal influence producing a different clinical outcome of audiological and vestibular tests, an etiopathogenetic factor in audio-vestibular disorders resulting in different clinical features observed between male and female hearing impaired subjects (Corazzi et al., 2020). Additionally, gender role differences may be caused by men having higher hearing threshold deterioration at high frequencies as more noise exposure in their workplace while women have higher hearing threshold deterioration at low frequencies (Ciorba et al., 2001).

Limitation

Some limitations existed within this study. First, a larger number of samples would provide wider coverage. Second, age-wise criteria inclusion could have given more appropriate results for the test items for each age group. Third, the Inclusion of criteria on the uses of hearing aids among the samples would give more desirable to see the effect of hearing aids. Fourth, Medical treatment and non-treatment criteria could have been included to see the effects of treatment on the used scales. Fifth, the inclusion of the types and levels of hearing impairment on the dependent variables would provide more information for each level of hearing impairment and different types of hearing impairments. Sixth, more inclusion of dependent variables was very much attempted to know more about the impact of hearing impairment.

Suggestion

Based on the limitation faced in the study, some suggestion was made for future research. The incorporation of a larger number of samples would provide more information that would be more appropriate for generalizing the targeted population. Second, the inclusion of the age group in the independent criteria would give more appropriate results of the test items for each different age group. Third, the Inclusion of uses of hearing aids such as types of hearing aids, duration of use, and age of using among the samples would give more desirable to see the effect of hearing aids. Fourth, Medical treatment and non-treatment criteria could have been included to see the effects of treatment on the used scales. Fifth, the inclusion of the types and levels

of hearing impairment on the dependent variables would give more information. Sixth, the inclusion of more dependent variables such as personality, intelligence level, and other psychological variables was very much attempted to know more about the impact of hearing impairment.

Significance of the study

This study is one of the first in-depth, large-scale studies that investigated mental health problems and psychological well-being among the Aimol hearing-impaired samples. It provided the level of mental health problems and psychological well-being for the targeted group by highlighting the significant difference between Hearing impaired samples showed higher scores on mental health problems and lower on psychological well-being variables than normal hearing samples. And the same trend was found that Rural hearing impaired samples scored higher than Urban hearing-impaired samples. Female hearing impaired scored higher on mental health problems than male hearing impaired but lower on psychological well-being. Overall results suggested an adverse effect of hearing impairment was seen among the Aimol hearing-impaired samples that hampered their psychological well-being, more attention was needed among rural hearing impaired and female hearing impaired in the Aimol community.

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