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Exploring the Interplay of Psychological Distress, Life Satisfaction, and Social Media Usage in Elderly Individuals with Hearing Impairments

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Abstract

The objectives of this study are twofold: i) to assess the mediating role of psychological distress among elderly people on the association between their hearing impairment's severity and their life satisfaction; and ii) to assess whether using social media moderates these mediating associations. The study sample included 210 older adults (M age = 65.90, SD = 9.55; 104 men and 106 women) from several government, semi-government and private sector hospitals. They were assessed by self-report measures on the Kessler Psychological Distress and Satisfaction with Life scales. The assessment of the severity of their impairment and their use of social media indicates that in the study sample, psychological distress mediates the association between hearing impairment's severity and satisfaction with life. Moreover, the results of the moderated mediation model show that it is the duration of the use of social media that moderates these mediated links between the severity of hearing impairment, psychological distress, and life satisfaction. Specifically, the conditional indirect effects of psychological distress were stronger among the elderly people who used social media for shorter periods and weaker for those who used it for longer.

Keywords: social media usage, psychological distress, life satisfaction

Introducion

In recent years, there has been a global rise in life expectancy, meaning that there are more elderly people than a few years ago. These elderly people experience various health-related problems (Skouby, Kivimäki, Haukiputo, Lynggaard & Windekilde, 2014), and age-related hearing loss is one of main issues. This is a progressive process that typically starts after the age of 40 years and intensifies after 80. Around 30% of people aged over 65 years suffer from significant hearing loss. Hearing loss in older adults is associated with significant stress and anxiety (Jayakody et al., 2018). The psychological distress can become so great that they need antidepressant medications and mental health services to overcome the depressive symptoms (Bigelow et al., 2020). Elderly people with significant hearing loss experience difficulties in social interaction, so it also affects their level of activity and quality of life (Brink & Stones, 2007). Studies have shown that

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parameters such as successful, healthy and productive ageing are negatively impacted by hearing loss (Wahl et al., 2013; Lustig, & Olson, 2014). Furthermore, Giallini et al. (2022) did a narrative review of 950 studies on the effectiveness of psychosocial and communicative interventions designed for hearing impaired elders. Only 9 studies focused on quality of life and psychosocial wellbeing. Thus, highlighting the need to develop effective procedures so that hearing impaired elderly individuals can take maximum benefits.

Quality of life is strongly and adversely affected by hearing loss. The impact is not associated with the degree of deafness, as individuals consider themselves markedly incapable of performing routine life chores when they have only mild to moderate hearing loss (Mulrow et al., 1990). It has been found by several studies that hearing loss and related disability may discourage people from participating in socially challenging situations. This causes isolation, in turn resulting in depression, irritability and a sense of inferiority. These psychological issues result in a person affected by hearing loss displaying altered social behaviour (Monzani, Galeazzi, Genovese, Marrara & Martini, 2008). Hearing loss in elderly individuals is a non-reversible and progressive disease, so it is important to screen patients with hearing loss for its impact on their quality of life (Niazi, Ejaz & Muazzam, 2020). At the start of this century, around the globe a new form of communication emerged. This was the era of new social media sites (Sutcliffe et at., 2022). They rapidly became popular as a leisure activity for millions and have since developed into important companionship for ordinary people, somewhere that they can both locate information and find social support to cope with life's daily challenges. The psychological aspects of the use of social media have been studied in relation to Lazarus and Folkman's transactional model of stress. At the same time as smart cities are striving to improve their facilities through using the power of social media (Doran, Gokhale & Dagnino, 2013, Lu et al., 2021), it has been observed that such sites have a role in boosting peoples' coping and wellbeing; however, it is essential to use them in a healthy manner that is routine family and work life is not impaired by the use of social media (Schoenebeck, 2014) otherwise they themselves may become a source of stress (Demirtepe-Saygili, 2020).

Older adults can use social media sites as a coping mechanism to manage stress. Those who are more involved in online communities and access social media sites for psychological support show a lower level of perceived stress (Wright, 2000, Malak et al., 2021). Their use of social media and everyday technologies leads to increased self-efficacy and coping with stress (Yagil, Cohen & Beer, 2016, Qaisar et al., 2021). Among adults aged 65 years and over, it is associated with better performance in the four cognitive domains of attention, processing speed, working memory and inhibitory control (Quinn, 2018). During later life, elderly individuals face certain challenges in their daily lives due to age-related factors of limited mobility, chronic disease and similar. This leads to a diminished physical connection to their surroundings, especially friends and family. Physical isolation can cause the elderly great psychological stress; however, use of social media keeps them linked to their surroundings and families, thus more socially satisfied (Bell et al., 2013). For elderly who are hard of hearing, too, social media can play a pivotal

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role in reducing psychological stress. The use of various social media platforms can achieve better connectivity and interaction in their communities (Crowson, Tucci & Kaylie, 2018; Kožuh & Debevc, 2020). Those who have to use hearing aids and devices also benefit from better communication via these social media platforms, educating themselves in the use of their device (Choudhury, Dinger & Fichera, 2017). In another study, several interviews were conducted to explore how availability of support on-line can bring positive outcomes in the lives of people affected with tinnitus during Covid-19 pandemic. Participants of the study had recently attended a digital workshop of support group for people suffering from tinnitus. Findings revealed that participants felt well informed, part of the community and they started living better with their conditions as compared to the times when they did not have any digital support available (Marks, Handscomb, & Remskar, 2023).

Previous studies suggest that ageing and/or hearing impairments are associated with multiple psychological and chronic mental health conditions (Ilyas & Muazzam, 2015). The current study extends earlier findings by assessing whether psychological distress mediates the association between the severity of impairment and life satisfaction among hearing-impaired elderly people. Moreover, using social media channels to obtain social support and leisure activities is likely to buffer the impact of their impairment on their psychological distress. It is likely that the mediating link between the levels of hearing impairment, psychological distress and life satisfaction in elderly people with q hearing impairment may vary with the extent of social media usage, given that levels of psychological distress may be dissimilar among people with varying durations of use of social media. This may lead to differing explanation of the hearing impairment–psychological distress–life satisfaction links among people on social media who use the sites for a greater and fewer number of hours. More specifically, it is hypothesized that, in elderly individuals with a hearing impairment, psychological distress mediates the association between the levels of hearing impairment and life satisfaction. A secondary hypothesis is that extent of social media usage moderates these mediational links.

It is probable that the study's chief contribution lies in its assessment of these objectives with an underrepresented sample of elderly people with hearing impairment in the South Asian region. This is in contrast to the available studies, which have mainly been conducted on healthy samples of ageing people in Western countries. To the best of our knowledge, such mediational associations have never been assessed in hearing-impaired elderly people under these conditions. The present study aimed to achieve the following objectives:

I. To assess the mediational associations between the severity of a hearing impairment, psychological distress and life satisfaction among elderly people with a hearing impairment.
II. To assess whether, in the sample studied, the extent of social media use moderates these mediational associations.

Data and Method

The cross-sectional study was conducted in Lahore, Pakistan, from June 2019 to February 2020. The sample was of 210 older adults with a hearing impairment (M age = 65.90, SD = 9.55). The

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participants comprised 104 men and 106 women selected by non-probability purposive sampling. The clinical diagnosis of hearing impairment by physicians was made by means of audiometry. Hearing-impaired patients under 50 years were excluded from the study.

Ethical Considerations

The study was approved by committee of respective universities board. Informed consent was taken from all the research participants, their privacy and confidentiality were maintained throughout the research. No physical or psychological harm was inflicted on them. They were given the right to withdraw from the research at any point in time.

Data Collection

Along with Kessler Psychological Distress (K10) and Satisfaction with Life (SWLS) scales, a brief demographic form was employed to collect data. Participants' psychological distress was measured by the Kessler Psychological Distress Scale (K10), which consists of 10 items graded on a Likert scale of 5 points (1 = none of the time, to 5 = all of the time). Non-specific psychological distress, anxiety and depression have been proved to be predicted well by K10, which is widely used as a global measure of such distress. The reliability scores of the K10 tests ranged from 0.89 to 0.91 (Furukawa, Kessler, Slade & Andrews, 2003). Subjective wellbeing among participants was assessed by the SWLS. This is a short, five-item test; the responses were rated on a seven-point Likert scale (1 = strongly agree, to 7 = strongly disagree). It is widely used to measure life satisfaction and has good psychometric properties. The reliability of the scale was reported by its authors to be 0.87 (Pavot & Diener, 2009). Participants reported their social media usage as total number of hours spent on social media in a day.

Table 1. *Descriptive demographic statistics and disease-related variables*

Variable	Category	*F* (%age)
Gender	men	104 (49.5)
	Women	106 (51.5)
Education status*	educated	109 (52)
	uneducated	101 (48)
Marital status	married	148 (71)
	unmarried	13 (6)
	widowed	49 (23)
Socioeconomic status	upper	51 (24)
	middle	130 (62)
	lower	29 (14)
Occupation	unemployed	94 (49)
	government job	35 (17)
	private job	48 (23)
	retired	33 (16)
Family system	joint	64 (30)
	nuclear	146 (70)
Other physical disorder	yes	147 (70)
	no	63 (30)

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Other psychological disorder	yes	26 (12)
	no	184 (88)
Level of problem	mild	54 (26)
	moderate	70 (33)
	severe	76 (36)
	profound	10 (5)
Use of hearing aid	yes	99 (47)
	no	111 (52)

* Participants who had completed at least primary education were considered educated.

After elaborating the purpose of the study, participants' informed consent was obtained. They were assured of the confidentiality of their personal information. Urdu versions of both K10 and SWLS were used to collect data on the study's variables. A separate sheet collected demographic information on age, gender, marital status, family system, socioeconomic status, use of social media and the necessary details about their problem. SPSS 21 was used for the data analysis. The analysis of the basic variables was performed using descriptive statistics.

Data Analysis Strategy

Descriptive scores for the control and study variables were calculated. Independent sample t test values were calculated to analyze group differences in the extent of social media use and levels of psychological distress and life satisfaction in terms of the specific dichotomous demographic variables (gender, education status, marital status, family system, associated physical and psychological disorders and use of a hearing aid). Next, one-way ANOVA was used to analyses group differences in other categorical variables (socioeconomic status, occupation and level of hearing impairment). Then, the correlations between study variables were calculated. Finally, using PROCESS software (Preacher & Hayes, 2008), a mediation model analyzing Model 4 and a moderated mediation model analyzing Model 7 assessed the direct, indirect and conditional indirect effects of psychological distress on the association between the severity of hearing impairment and life satisfaction and the extent of social media use. To calculate Model 4, the severity of hearing impairment was analyzed as an independent variable, the degree of psychological distress as a mediator and level of life satisfaction as a dependent variable. To calculate Model 7, social media usage was analyzed as a moderator of the association between IV (severity of impairment) and mediator (psychological distress). Notably, PROCESS yielded unstandardized regression coefficients; therefore, before analyzing the mediation and moderated mediation models, the raw scores on all study variables were standardized (M = 1, SD = 0). By doing so, the resulting regression weights became equivalent to standardized regression weights.

Results and Discussion

The descriptive scores for the continuous demographic and study variables are presented in Table 2. Of the group differences calculated in the dichotomous variables, only gender turned out to be a significant factor, with women scoring higher on social media use (women: M=5.59, SD=2.37 › men: M=2.70, SD=1.44) and life satisfaction (women: M=21.5, SD=4.32 › men: M=17.55, SD=4.31), while men scored higher on psychological distress (men: M=36.05, SD=3.04 › women: M=29.42,

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SD=3.56). No other dichotomous variable was significant. The non-significant group differences may be attributed to non-comparable group sizes. Further, the results from one-way ANOVA showed occupation to be a significant factor of social media use (F[3,206]=2.69, p<.05) and psychological distress (F[3,206]=4.70, p<.01) and severity of impairment to be a significant factor for all three study variables (social media use: F[3,206]=27.48, p<.001; psychological distress: F[3,206]=75.29, p<.001; and life satisfaction F[3,206]=29.10, p<.001).

Descriptive Statistics

The descriptive statistics on occupation showed that retired and unemployed individuals scored higher on social media use than individuals who held down jobs (retired: M=4.18, SD=2.96 and unemployed: M=4.62, SD=2.15 › private job: M=3.43, SD=2.34 and government job: M=3.91, SD=2.58). Regarding psychological distress as a dependent variable, the group differences showed that individuals with a private job scored higher than those with a government job or being retired, while unemployed individuals scored lowest on this variable (private job: M=34.06, SD=4.77›government job: M=33.57, SD=4.82 and retired M=33.48, SD=5.88›unemployed: M=31.40, SD=3.78). The descriptive statistics analyzing the level of impairment as an independent variable for social media use as a dependent variable showed that individuals with a mild impairment endorsed the highest use of social media (M=5.96, SD=2.95), followed by individuals with moderate impairment (M=4.37, SD=1.71); those with a severe impairment reported less use (M=3.08, SD=1.01), while those with a profound impairment reported the least (M=1.20, SD=0.63). Conversely, for psychological distress as a dependent variable, these individuals with a profound level of impairment reported the highest level of psychological distress (M=40.90, SD=2.38), followed by those with severe (M=35.88, SD=3.11) and moderate impairment (M=30.92, SD=2.74); those individuals with a mild level reported the least psychological distress (M=29.00, SD=4.11). For life satisfaction as a criterion variable, individuals with a mild level of impairment reported greater life satisfaction (M=22.85, SD=4.87), followed by those with moderate (M=20.16, SD=3.83) and severe levels (M=17.55, SD=3.68); and, finally, individuals with a profound impairment reported the poorest life satisfaction (M=12.60, SD=1.58).

The results from correlation analysis in Table 2 showed that, of the demographic factors, duration and severity of hearing impairment were significant correlates of social media use, psychological distress, and life satisfaction. Further, psychological distress was a significant negative correlate of life satisfaction, while social media use was a significant positive correlate.

Table 2. *Descriptive statistics and correlation between study variables*

Variable	M(SD)	α	Social media use	Psychological distress	Life satisfaction
Age	65.90 (9.55)	-	0.12	-0.02	0.10
Duration of problem	3.54 (1.97)	-	-0.55***	0.66***	-0.54***
Duration of treatment	1.87 (1.27)	-	-0.08	0.17*	-0.02
Level of impairment	2[a]	-	-0.53***	0.70***	-0.54***
Social media use[b]	4.16 (2.44)	-	-	-0.87***	0.69***

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Psychological distress	32.70 (4.69)	.81	-	-0.68***
Life satisfaction	19.54 (4.74)	.77	-	

* = p< .05, ** = p< .01; *** = p< .001; [a] = reported value is median; [b] =social media use was assessed in number of hours' social media used.

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Table 3. *Moderated mediation model showing conditional indirect effects of psychological distress in relation between level of hearing impairment and life satisfaction across levels of social media use*

Predictor	Criterion variable			
	Model 4			Model 7
	1st Reg[c] Life satisfaction	2nd Reg[c] Psy. Distress	3rd Reg[c] Life satisfaction	4th Reg[c] Psy. distress
Education[a]	0.14 (0.12)	-0.02 (0.08)	0.13 (0.10)	0.03 (0.05)
Gender[a]	0.30 (0.14)*	-0.89 (0.10)***	-0.32 (0.14)*	-0.36 (0.06)***
Duration of treatment[a]	-0.02 (0.02)	0.02 (0.01)	-0.01 (0.01)	0.01 (0.01)
Duration of problem[a]	-0.10 (0.05)*	-0.01 (0.03)	0.09 (0.04)*	0.01 (0.02)
Severity of impairment	-0.45 (0.07)***	0.43 (0.05)***	-0.15 (0.07)*	0.35 (0.05)***
Psy. Distress	-	-	-0.69 (0.08)***	-
Social media use	-	-	-	-0.27 (0.01)***
SImpXSocial media use	-	-	-	-0.03 (0.01)**
R2	0.33	0.64	0.50	0.87
Model fit: F(df)	19.87[b] (5,204)	74.28[b] (5,204)	33.41[b] (6,203)	203.14[b] (7,202)
Effects	Total effects = -0.45(0.07)***; Direct effect = -0.15(0.07)*			
Indirect effect (psy. distress)	-0.30 (0.07), Sobel z = -5.79***			
Conditional indirect effects of psy. distress at levels of social media use	Level 1 (lesser use of social media at level 1.72) = -0.21 (.04) Level 2 (moderate use of social media at level 4.16) = -0.16 (0.03) Level 3 (greater use of social media at level 6.60) = -0.11 (0.04)			

*= p< 0.05, **= p< 0.01; *** = p< 0.001: Psy. distress = psychological distress; SImp= Severity of Impairment; Model 4 represents the mediation model in PROCESS; Model 7 represents the moderated mediation model in PROCESS; Values shown are regression weights; Raw scores are standardized before calculating mediation in PROCESS; Number of bootstrap samples for bias-corrected confidence interval is 5000; [a] = Control variables; [b] = All F values of model fit indexes are significant at p < 0.001; c= Regression model.

Mediation Analysis

Finally, the results from the mediation analysis showed that, after controlling for demographics, the severity of impairment significantly negatively predicted life satisfaction; that of psychological distress mediated this negative link significantly. This is evident from the results in Table 3 ad Figure 1. When psychological distress was added to the third regression equation (Model 4) as a

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predictor of life satisfaction, the regression weight of the severity of impairment reduced from -0.45 to -0.15, in a significant and indirect effect (Sobel z = -5.79, p<.001). The results of the moderated mediation analysis showed that the level of social media use affected these mediated associations by moderating the link between the levels of hearing impairment and life satisfaction (interaction effect = -.03, p<.01). The indirect effects of psychological distress were conditional at varying usage of social media, with the greatest significant indirect effects seen in individuals making the least use of social media and the least indirect effect for those reporting the most use (Table 3). Figure 1 also clearly shows that social media use moderates the mediated associations by reducing the indirect effects of psychological distress in association between severity of impairment and life satisfaction.

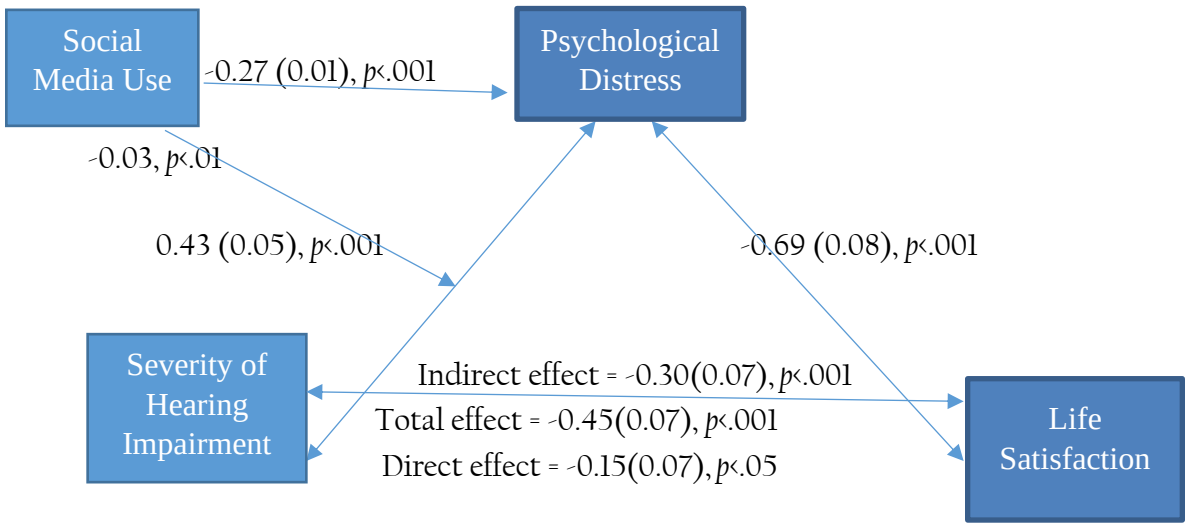

Figure 1. Model of association between use of social media, psychological distress, hearing impairment and life satisfaction

Discussion in relation to the Objectives

The objectives of the study were twofold: i) to assess the mediational associations between severity of hearing impairment and levels of psychological distress and life satisfaction in elderly hearing-impair people; and ii) to assess whether the extent of social media use moderates these mediational associations in the sample studied. The study objectives were approached by calculating the correlations between the severity of the hearing impairment, levels of psychological distress and life satisfaction and the extent of social media use. This was followed by mediation and moderated mediation analyses to evaluate the conditional indirect effects of psychological distress in the relationship between severity of hearing impairment and life satisfaction across elderly people with a hearing impairment who used social media for longer and shorter periods. In line with this study's mediation hypothesis, it was found that psychological distress mediated the association between the severity of hearing impairment and life satisfaction. From the correlation analyses, it was found that the severity of the hearing impairment was significantly and negatively correlated with life satisfaction and was positively correlated with

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psychological distress. These results suggest that with increasing severity in an elderly person's hearing impairment, psychological distress increases and life satisfaction decreases. The finding of positive correlation between hearing impairment and psychological distress is unsurprising and consistent with findings from many earlier studies on elderly people (Contrera et al., 2016; Jayakody et al., 2018). The psychological distress and mental health issues associated with a hearing impairment also result in an altered pattern of social interaction and may lead to a diminished subjective evaluation of life satisfaction (Monzani et al., 2008). Despite the established connection between hearing loss and psychological distress, age-related hearing impairment often remains unrecognized and untreated. Even individuals who have a hearing impairment regard it not as a serious problem but as part of the normal ageing process.

From correlation analyses, it was found that the duration of social media use was negatively correlated with psychological distress and positively correlated with life satisfaction. Findings from previous studies show a consistent connection between the social media use and psychological distress and life satisfaction, however, the direction of such an association is found to be conditional on age. Recent studies based on healthy adolescent samples show a positive connection between higher levels of social media use and increased distress and mental health symptoms (Keles et al., 2019), while others report in older adults a positive link between social media use and life satisfaction, even after controlling for many possible confounding factors (Gaia et al., 2020). Likewise, the current study shows a positive connection between social media use and life satisfaction in elderly people with compromised hearing. The current study's finding seems reasonable, in that hearing problems pose a serious threat to social interaction among those already at risk of social challenges due to age-related factors. The literature (Brink & Stones, 2007) supports the view that elderly individuals with hearing loss face considerable challenges to social interaction, and in turn this impacts on their quality of life and life satisfaction. For such individuals, social media tools may provide them with a wider social network so that they can interact with more people. Hence, the emergence of social media as a modern form of communication and companion to ordinary people is serving as a means of social support for the psychological challenges associated with hearing impairment.

Evidence from diverse studies has proposed and established a close connection between hearing loss and psychological distress Discomfort in physical status of an individual leads to psychological distress (Hassan, Muazzam & Anjum, 2019) however, relatively little is known about how the use of social media is linked to the life satisfaction of individuals with compromised abilities. The current study thus extends previous knowledge on the hearing impairment–psychological distress–life satisfaction links by assessing the moderating role of social media. The proposition was tested by analyzing a moderated mediation model that assesses the moderating effects of social media use on the mediated associations. The results support the view that the mediated links between the severity of hearing impairment, psychological distress, and life satisfaction are conditional on the extent of the social media use. More specifically, for hearing impaired elderly people, the mediated connections are weaker at longer durations of social media

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use than at shorter duration. Likewise, social media use buffers the effect of the severity of hearing impairment on psychological distress and, in turn, on life satisfaction. In short, social media use weakens the mediating effect of psychological distress on life satisfaction, supporting the findings of earlier studies that social media use in older adults represents a mechanism to cope with stress (Gaia et al., 2020; Wright, 2000). Earlier findings have described how elderly individuals who are more involved with online communities and who use social media sites for psychological support report less perceived stress (Wright, 2000), elevated levels of self-efficacy and better stress management (Yagil, Cohen & Beer, 2016).

Implications and Limitations

For healthcare practitioners, this study offers important insights into the introduction of plans and policies to identify and prevent the mental health problems at a primary level, and to improve the wellbeing of older people with a hearing impairment at a secondary level. Despite the importance of ability to hear, hearing loss – and specifically age-related hearing loss – often remains an unacknowledged and unattended issue. Even the people with hearing problems hardly consider it to a serious issue, and around the globe, there is a myth that hearing impairment comes with aging, is completely normal and must not be taken as a disability. Under such circumstances, the conceptualization of effective framework for timely problem identification becomes a necessity so that availability of proper hearing aids and assistance must be ensured for the people who suffer from hearing loss and even those who are at risk. A treatment plan can facilitate and provide elderly people with better assisted-listening devices to minimize the handicap. These plans should work towards the psychological aspects of the disease, teaching coping strategies that may have a positive effect on senior citizens' quality of life.

Therefore, it must be ensured that professionals working with hearing impaired people, alongside physically monitoring their hearing loss, should do proper screening out psychological distress. Social support provision can be incorporated as an important aspect of the management and rehabilitation of older adults with a hearing impairment. It is therefore imperative that they should be assisted to use social media to focus on adaptive ways to reduce their distress and improve their subjective wellbeing. This is one of the first studies to examine the conditional indirect effects of psychological distress with differing usage of social media in a South Asian country on older adults with a hearing impairment. Besides strength, the findings should interpret with caution in light of certain limitations. First, its conclusions are based on a cross-sectional study that compares subjects who use social media to varying degrees. Additionally, its use of self-report measures may leave the way open to self-report bias. Moreover, the sample was restricted to elderly people from smart cities, as they have access to social media. Hence, due to the common methodological challenge of selection bias (i.e. the study selected technology-using adults in public-sector hospitals), the findings are limited in scope and cannot be generalized to the older population in rural areas. Future research is needed to elucidate the relationship of hearing impairment and mental health and wellbeing across both rural and urban settings.

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Concluding Remarks

Taken together, the findings of this study show that: i) psychological distress mediates the association between the severity of hearing impairment and life satisfaction in elderly people with a hearing impairment; ii) social media use buffers the undesirable effects of hearing impairment on psychological distress; and iii) mediated associations are conditional on the duration of social media usage, with greater use weakening the mediating effect of psychological distress in hearing impairment—life satisfaction link. In short, the study is a valuable addition to our understanding of how psychological distress of impaired hearing diminishes life satisfaction in the elderly and how the use of social media as a coping mechanism can reduce the former and increase the latter. The findings confirm those of earlier studies on the use of social media by elderly people.

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