Kufa Journal for Nursing Sciences
Open Access Full Text Article

Publisher
University of Kufa, Faculty of Nursing

Received: 05 November, 2025
Accepted: 17 November, 2025
Published: 14 December, 2025
Vol. 15(2), 2025: 87 – 102

https://doi.org/10.36321/kjns.vi20252.22298
ORIGINAL RESEARCH

Can Older Adults' Health Beliefs Predict Their Using of Hearing Aids? The Health Belief Model as a Theoretical Framework

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ABSTRACT

Background: Older adults, seek (or do not seek) hearing healthcare, are not always aware of the magnitude of their hearing loss. Sometimes, they do not believe they would benefit from using a hearing aid. They often have low Self-Efficacy and fear from not having the skills to learn new things (e.g., how to handle the hearing aids).

Objectives: This study aims to (1) identify factors predicting Self-Efficacy for using hearing aids, and (2) investigate the differences in the HBM constructs among the groups of marital status, level of education, general health, gender, using hearing aid, and having diabetes mellitus.

Methodology: The researcher used a descriptive predictive correlational design. The study included a convenience sample of 306 older adults who were recruited from two geriatric homes. The study instrument includes participants' sociodemographic characteristics, medical profile, and the Hearing Beliefs Questionnaire. Data was analyzed using the statistical package for social science.

Results: Participants' age and Perceived Barriers negatively predict their Self-Efficacy for using hearing aids. Cues-to-Action and Perceived Susceptibility positively predicted more Self-Efficacy for using hearing aids. There are statistically significant differences in the Perceived Severity, Perceived Benefits, and Perceived Self-Efficacy among the level of education groups.

Conclusion: The younger the age and the lesser the Perceived Barriers, the greater the Self-Efficacy of using hearing aids. The greater the Cues-to-Action and Perceived Susceptibility, the greater the Self-Efficacy for using hearing aids.

Keywords: Health Belief Model; Hearing Health Beliefs; Older Adults.

INTRODUCTION

Millions of individuals suffer from hearing loss worldwide, and it is thought to be the fourth greatest cause of disability globally (Cunningham & Tucci, 2017). Older adults, seek (or do not seek) hearing healthcare, are not always aware of the magnitude of their hearing loss. Sometimes, they do not believe they would benefit from using a hearing aid. They often have low Self-Efficacy and fear from not having the skills to learn new things (e.g., how to handle the hearing aids) (Öberg, 2015).

People's beliefs about hearing aids and rehabilitation may be understood within the framework of the Health Belief Model, a psychosocial model of health behavior change that was developed to predict the likelihood of a person taking recommended preventive health action and to understand a person's motivation to seek health care

How to Cite: Abd Ali, M. B. H. (2025). Can older adults' health beliefs predict their using of hearing aids? The health belief model as a theoretical framework. *Kufa Journal for Nursing Sciences, 15*(2), 87-102. https://doi.org/10.36321/kjns.vi20252.22298.

(Hochbaum, 1958; Rosenstock, 1974). The HBM was used to identify determinants of being screened for tuberculosis. Health behavior change is mediated by the five health constructs (Diclemente et al., 2019; Rosenstock, 2005). Perceived Susceptibility (i.e., the likelihood an individual will suffer from hearing loss), Perceived Severity of hearing loss (i.e., severity of the hearing loss and its consequences), Perceived Barriers to rehabilitation (i.e., the obstacles and psychosocial costs of conducting an intervention), Perceived Self-Efficacy (i.e., the degree to which the individual thinks he or she could manage to use hearing aids), and Perceived Benefit of the rehabilitation (i.e., the believed effects of the rehabilitation). In addition, Cues-to-Action can motivate behavior change. The HBM postulates that individuals who perceive perceives high severity, susceptibility, benefits, cues for action and self-efficacy, and few barriers would have greater likelihood to engage in behavior change (DiClemente et al., 2019).

A work group report by the National Institute on Deafness and Other Communication Disorders (NIDCD) on accessible and affordable hearing health care (Donahue et al., 2010), hearing loss is the third most prevalent chronic health condition in older adults (Collins, 1997) and, thus, is a leading public health concern.

Untreated age-related hearing loss can lead to such negative consequences as social isolation, depression, anxiety, loneliness, stress in relationships, and an increased risk of incident all-cause dementia. These consequences, in combination, can increase activity limitations and participation restrictions with concomitant decreases in overall health-related quality of life (Arlinger, 2003; Collins, 1997; Donahue et al., 2010).

The notion that hearing loss is just a part of aging and thus requires no attention and assistance seems to be typical of older individuals and clinicians alike (Dalton et al., 2003). Such “agism” is also seen in the other medical fields in the form of under prescription of beneficial medications and a lack of help seeking for pain and for symptoms of dementia (Cherubini et al., 2012; Gordon-Salant et al., 1994; Lin et al., 2011).

Community-based strategies for promoting successful hearing health may also be crucial in reinforcing the maintenance of hearing aid use and hearing-related behavior changes after rehabilitation has been provided.

Psychological variables such as personal beliefs, attitudes, and values regarding health and wellbeing, illness, and intervention options all play a role in an individual’s decision to seek and adhere to healthcare. Successful rehabilitative outcomes for adults with hearing impairment require cognitive and behavioral changes in the form of acknowledging a hearing disability, seeking professional help, and following through with recommendations for rehabilitation (Cornally & McCarthy, 2011).

This study is the first both in Iraq and the Middle East region that sheds the light on older adults’ intention to use hearing aids.

AIMS OF THE STUDY

This study aims to (1) identify factors predicting Self-Efficacy for using hearing aids, and (2) investigate the differences in the HBM constructs among the groups of marital status, level of education, general health, gender, using hearing aid, and having diabetes mellitus.

METHODOLOGY

Ethics: This study was approved by the ethics committee (No. 2996). This study is in accordance with the Helsinki Declaration of 1975, as revised in 2000. The researcher presented informed consent to the study participants, assured them their participation in this study is voluntary, they can withdraw at any time they would like to do so. The researcher assured them that all information obtained from this study will be securely maintained and

safeguarded through the study phases and after publication.

Study design: A descriptive predictive correlational design was used to guide this study.

Selection and Description of Participants: The study included a convenience sample of older adults who reside in two geriatric care homes. The sample size was calculated using the G*Power software. Based on a moderate effect size (0.25), alpha error probability of (0.05), power of (0.95), and five groups, the total sample size would be 305. The final sample size is 306. The inclusion criteria include individuals of both sexes who age 60-years and older, and those who do not have any psychiatric-mental disorder. The exclusion criteria include individuals who are younger than 65-years and those who have any psychiatric-mental disorder.

Statistics: Data were analyzed using the statistical package for social science (SPSS) version 27, IBM. The statistical measures used include the descriptive of frequency and percent. They also include the mean and standard deviation, stepwise regression, one-way analysis of variance, and independent-sample T-Test.

Measures

The study instrument includes participants' sociodemographic characteristics of age, gender, marital status, and level of education. It also includes participants' medical profile of having diabetes mellitus (DM), self-rated health, and hearing aid use.

The Hearing Beliefs Questionnaire (HBQ)

The Hearing Beliefs Questionnaire (HBQ) (Saunders et al., 2017) assesses hearing health beliefs in terms of their relevance to help seeking, hearing-aid acquisition, and hearing-aid use contextualized within the Health Belief Model (HBM). The HBQ includes 26 items distributed into the six constructs of Perceived Susceptibility (4 items), Perceived Severity (3 items), Perceived Benefits (5 items), Perceived Barriers (8 items), Cues-to-Action (3 items), and Perceived Self-Efficacy (3 items).

In the 26-item HBQ, with the exception of items in the Perceived Self-Efficacy Scale, all items have factor loadings of greater than 0.4, are unique to just one scale, and have Cronbach's α -values ranging from 0.605 to 0.774. While the reliability of the scales is not high, the values here are not atypical of other health belief assessment tools (Mukadam et al., 2010; Saunders et al., 2017).

RESULTS

Table 1 shows the mean age is 69.27 ± 6.83; more than a half age 60-69-years (n = 51.6%), followed by those who age 70-79-years (n = 116; 37.9%), and those who age 80-years and older (n = 32; 10.5%).

Regarding the gender, most are males (n = 188; 61.4%) compared to females (n = 118; 38.6%). More than two-fifths are married (n = 126; 41.2%), followed by those who are widow/widowers (n = 78; 25.5%), those who are divorced (n = 58; 19.0%), and those who are unmarried (n = 44; 14.4%).

Concerning the level of education, around two-fifth read and write (n = 122; 39.9%), followed by those who are elementary school graduates (n = 64; 20.9%), those who hold a bachelor's degree (n = 36; 11.8%), those who are high school graduates (n = 34; 11.1%), those who are middle school graduates (n = 30; 9.8%), and those who hold an associate degree (n = 20; 6.5%).

The majority reported that they do not use hearing aids (n = 272; 88.9%) compared to those who use them (n = 34; 11.1%). More than a quarter reported that their physicians told them that they have DM (n = 84; 27.5%). When participants asked to describe their general health, more than a half described it as fair (n = 160; 52.3%), followed by those who described it as good (n = 76; 24.8%), those who described it as poor (n = 64; 20.9%), and those who described it as excellent (n = 6; 2.0%).

Participants' age and Perceived Barriers negatively predict their Self-Efficacy for using hearing aids (p-value = .025, .002) respectively. On the other hand, Cues-to-Action and Perceived Susceptibility

positively predicted more Self-Efficacy for using hearing aids (p-value = .000, .000) respectively.

There are statistically significant differences in the Perceived Susceptibility, Perceived Severity, and Cues-To-Action among the marital status groups (p-value = .007, .002, .010) respectively.

There are statistically significant differences in the Perceived Severity, Perceived Benefits, and Perceived Self-Efficacy among the level of education groups (p-value = .031, .003, .027) respectively.

There are statistically significant differences in the Perceived Severity, Cues-To-Action, and Perceived Self-Efficacy among the self-rated general health groups (p-value = .001, .015, .000) respectively.

There are statistically significant differences in the Perceived Susceptibility, Perceived Benefits, and Perceived Self-Efficacy between gender groups (p-value = .004, .021, .013) respectively.

There is a statistically significant difference in the Perceived Susceptibility between using hearing aid groups (p-value = .021).

There are statistically significant differences in the Perceived Severity and Perceived Barriers between having DM groups (p-value = .034, .028) respectively.

DISCUSSION:

This descriptive predictive study aimed to identifying whether hearing health beliefs laid within the HBM.

Participants' age and Perceived Barriers negatively predicted their Self-Efficacy for using hearing aids. This finding implies the younger the individual, the greater the Self-Efficacy of using hearing aids. Further cross-tabulation demonstrated that younger participants have higher levels of education compared to older ones who have lower levels of education. This, in turn, can acquire them better health awareness which in turn make them more confident in using hearing aids than older counterparts. Research has demonstrated that Self-Efficacy is a vital factor in the continued use and adherence to hearing aids among older adults, particularly those already fitted with the hearing aids. The relationship between age and Self-Efficacy and hearing aid use has been the topic of several studies, and high Self-Efficacy has indeed been identified to be related to better management and consistent use of hearing aids in older populations (Öberg, 2015). Though age in itself may not always be the strongest predictor of Self-Efficacy, it is expected that older individuals with lower Self-Efficacy may be particularly reluctant in undertaking hearing aid use due to a lack of confidence in managing the devices themselves and a general lower expectation of benefit (Fuentes-López et al., 2019). With respect to the Perceived Barriers to using hearing aids, literature exhibit that low levels of hearing aid self-efficacy appear to be a barrier both to seeking help for hearing impairment and to a successful outcome with hearing aids (Meyer et al., 2014).

On the other hand, Cues-to-Action and Perceived Susceptibility positively predicted more Self-Efficacy for using hearing aids. The HBM posits that the Cues-To-Action may be events (e.g., watching a news broadcast that highlights a celebrity's hearing loss and how it stemmed from aging process), reminders provided by a credible source (e.g., email or notice from physician's office or the health department reminding people that they are due for visiting the audiologist to examine their hearing ability), individuals who receive greater Cues-To-Action, and that those who perceive themselves more susceptible to develop a health problem would engage more in a health behavior (Donahue et al., 2010). This finding implies that when older adults receive health motivation and believe that they are highly susceptible to develop hearing loss, this prompt them to visit the audiologist and seek the required health care.

There was a statistically significant difference in the Perceived Susceptibility among the marital status groups. Further post hoc analysis displayed

that married participants have greater Perceived Susceptibility of hearing loss. On the other hand, divorced participants have the lesser Perceived Susceptibility. This finding could be explained as that married participants can experience stress that stem from their partners which may contribute to their belief of greater Perceived Susceptibility to develop hearing loss. Marital status has been considered an important social support factor that can influence health outcomes, including hearing impairment. Married people or those living with partners tend to have better social support, which may impact their health perceptions and responses (Denney & Boardman, 2021).

There was a statistically significant difference in the Perceived Severity among the marital status groups. Further post hoc analysis displayed that married participants believe that the anticipated hearing loss is as not as a serious health problem contrary to divorced participants who believe that the hearing loss is a serious health problem. This finding could be explained as that divorced participants may represent the anticipated hearing loss as a serious health problem owing to the absence of the partner who can support them when they develop hearing loss. Marital status significantly affects Perceived Severity and psychosocial effects of hearing loss. Research has documented that an individual's hearing loss within a married couple affects both one's own and one's spouse's mental health, especially symptoms of depression. In men, depressive symptoms are associated with their own hearing loss and the wife's hearing loss; in women, they are associated with their own and the spouse's hearing loss, while husbands' hearing loss does not predict depression in wives (West et al., 2023).

There was a statistically significant difference in the Cues-To-Action among the marital status groups. Further post hoc analysis displayed that married participants have greater Cues-To-Action value than those who are unmarried, widow/widowers, and divorced ones. This finding could be explained as that married participants may directly receive the required health motivation from their partners or indirectly where their partners may direct them to the appropriate, accessible health motivation pertinent to their hearing health. In marriages, the strain from hearing loss often leads to frustration and miscommunication, which may push partners to take action on the condition more proactively. The observation of a partner and its impact on daily communication are strong cues that trigger seeking help or adopting hearing interventions. Interventions such as hearing aids not only restore hearing but also renew the quality of communication and relationship satisfaction, further reinforcing the motivation to act. Overall, marital status strengthens the social context for cues to action in hearing loss, where the dynamics of spouses contribute significantly to recognition, motivation, and follow-through in hearing health measures (Knoetze et al., 2023).

There was a statistically significant difference in the Perceived Severity among the level of education groups. Further post hoc analysis exhibited that participants who read and write perceive themselves as more susceptible to developing hearing loss than their counterparts with higher levels of education. This finding could be explained as that having higher levels of education can acquire individuals the information about senescence and its coinciding deterioration in bodily functioning including hearing loss compared to those with lower levels of education. Education level appears related to perceived severity of hearing loss primarily through knowledge and attitudes concerning hearing health. Studies indicate that those at higher levels of education may understand more about hearing loss and ways of preventing the disorder, and their perceived severity is therefore different (Jacob et al., 2024).

There was a statistically significant difference in the Perceived Benefits among the level of education groups. Further post hoc analysis exhibited

that the Perceived Benefits values were higher among participants who hold a bachelor's degree. This finding could be explained as that having higher levels of education enable individuals to be more knowledgeable of the benefits they can attain when they intend to use hearing aids. The level of education seems to play a role in Perceived Benefits of the use of hearing aids, especially among adults with hearing impairments. These studies also reveal that higher education correlates positively with attitude and perceptions towards hearing aid use (Ashfaq et al., 2025).

There was a statistically significant difference in the Perceived Self-Efficacy among the level of education groups. Further post hoc analysis displayed that the values of the Perceived Self-Efficacy were higher among participants who hold a bachelor's degree. This finding could be explained as that having higher level of education enables individuals to be more knowledgeable of the benefits they can attain when they intend to use hearing aids which in turn renders them feel more confident in using hair aids. The level of education significantly associates with the Self-Efficacy of using hearing aids. Studies indicate that higher the educational level, the higher the hearing aid Self-Efficacy. This is partially because higher educational attainment promotes the ability to understand and manage hearing aids better, such as acquiring specific skills and reading user manuals, which are crucial for the proper conduct of such devices (Fuentes-López et al., 2019).

There was a statistically significant difference in the Perceived Severity among the self-rated general health groups. Further post hoc analysis displayed that the values of the Perceived Severity were higher among participants who described their general health as poor, followed by those who described their health as fair, good, and excellent. This finding implies that participants who describe their health as poor would be more feared of potential hearing loss. Self-rated health and Perceived Severity of hearing loss share a related concept where individuals make subjective assessments about their general health and the extent to which hearing impairment affects their lives. Research has mostly demonstrated that poorer self-rated health is associated with self-reported hearing difficulty. This is affected not only by the measured degree of hearing loss but also by complex auditory processing issues such as speech-in-noise difficulties, comorbid physical and mental health conditions, and psychological factors like depressive symptoms. A person who perceives his or her hearing loss to be severe tends to report lower self-rated health and reduced quality of life. Perception can affect emotional well-being and engagement in daily activities, independent of audiometric hearing loss severity (Dillard et al., 2024).

There was a statistically significant difference in the Cues-To-Action among the self-rated general health groups. Further post hoc analysis displayed that the values of the Cues-To-Action were greater among participants who described their general health as poor. This finding implies that those participants feel profoundly threatened of hearing loss which renders them seek health information relevant to their hearing health protection. Self-rated health and cues-to-action play an important role in hearing aid use. For instance, individual attitudes toward hearing aids, self-efficacy in managing hearing aids, and external cues-to-action have been found to strongly relate to hearing aid uptake and use. Several studies found that individuals who perceive greater benefits from amplification, feel a greater extent of their hearing loss, and receive more supportive cues from significant others or healthcare providers are more likely to seek help and use hearing aids. Agreement between the individual and health providers regarding the need for hearing aids has also been identified to facilitate uptake, while disagreement or lack of perceived need delays or prevents hearing aid use (Knoetze et al., 2023; Pronk et al., 2017).

There was a statistically significant difference in the Perceived Self-Efficacy among the self-rated general health groups. Further post hoc analysis displayed that the values of the Perceived Self-Efficacy were higher among participants who described their general health as excellent. This finding could be explained as that the perception of enjoying excellent health renders individuals feel more confident of themselves to use hearing aids when they need them. Self-rated health of the hearing aid users incorporates subjective assessments of the effects of hearing loss and hearing aids on their quality of life. Studies have indicated that better self-management of hearing loss, pertaining to Self-Efficacy, is associated with better hearing aid outcomes and satisfaction, and perceived quality of life improvement (Jilla et al., 2020).

There was a statistically significant difference in the Perceived Susceptibility between gender groups. Further group statistics display that the values of the Perceived Susceptibility were higher among male participants. This finding could be explained as that males assume the responsibility of earning their living which necessitates doing greater physical efforts and going through a variety of physical conditions which could increase their susceptibility of hearing loss. The association of gender with perceived susceptibility to hearing loss is complex, due both to biological and social reasons. Studies have revealed that, overall, men have higher incidences of hearing loss than women, due at least in part to biological differences. Gender also influences attitude towards noise exposure and use of hearing protection, which can affect perceived susceptibility. Each of these key aspects is discussed in detail below. Men are more likely to develop audiometric hearing loss earlier and with greater severity than women (Humes, 2023; Reavis et al., 2023).

There were statistically significant differences in the Perceived Benefits and Perceived Self-Efficacy between gender groups. Further group statistics display that the values of the Perceived Benefits were higher among female participants. This finding could be explained within the context of further cross-tabulation which displayed that the percent of female participants with higher level of education was greater than that of male participants. Thus, higher educational attainment can make female participants more knowledgeable of the Perceived Benefits of and more confident using hearing aids than male participants. There are indications of gender-related differences in perceptions and the utilization of hearing aids, although findings vary by outcome and by age or context. In general, women may report different levels of perceived benefit and different barriers to access compared with men, and stigma related to hearing loss and hearing aid use can be differently experienced across genders and life stages. Some research indicates that gender does not strongly determine satisfaction or objective outcomes with modern hearing aids, while other studies find subtle gender differences in how benefits are experienced or reported, potentially influenced by prior experience with amplification and expectations. Satisfaction with a device is generally very high across genders when fitting and support are appropriate (Staehelin et al., 2011; Williams et al., 2009).

There was a statistically significant difference in the Perceived Self-Efficacy between gender groups. Further group statistics display that the values of the Perceived Self-Efficacy were greater among female participants. This finding could be explained as that as female participants use hearing aids, these aids would be hidden under hijab where individual may feel embarrassed or shamed if they were apparent. Across several populations, women tend to seek help earlier after perceived hearing problems and are more likely than their peers to disclose hearing loss, factors that can influence adoption timing of hearing aids (Has). Younger women in some cohorts may report more negative perceptions or stigma toward HA use than older

women, factors which can impact initial self-efficacy and trial patterns. This indicates social and cultural factors that shape self-efficacy beliefs related to HA use (Lam et al., 2025).

There was a statistically significant difference in the Perceived Susceptibility between using hearing aid groups. Further group statistics display that the values of the Perceived Susceptibility were greater among participants who reported that they have been using hearing aids. This finding could be laid within the HBM which postulates that individuals who feel an impending health threat would be more likely to engage in a health behavior (Donahue et al., 2010).

There was a statistically significant difference in the Perceived Severity between having DM groups. Further group statistics display that the values of the Perceived Severity were greater among participants who reported that they have DM. This finding could be explained as that individuals with DM may realize that the DM they have can incur deleterious systematic health effects including its effects on the hearing. Diabetes mellitus is associated with an increased risk of hearing loss, and several studies suggest a positive relationship between poorer glycemic control and higher risk of bilateral sensorineural hearing loss, with some evidence more pronounced in younger adults. Health behaviors and treatment adherence can be influenced by perceived severity of hearing loss, especially in diabetes management when sensory changes may impact communication with clinicians and engagement in self-management (Deng et al., 2023).

There was a statistically significant difference in the Perceived Barriers between having DM groups. Further group statistics display that the values of the Perceived Barriers were greater among participants who reported that they have DM. Subsequent cross-tabulation demonstrate that the majority of individuals with DM do not use hearing aids since they may feel that using hearing aids besides having DM can make them feel that using hearing aids can subsidize their health. People with diabetes have a higher risk of developing hearing impairment, and several barriers influence hearing-aid uptake. Understanding these links and barriers allows the discovery of targeted screening, education, and support that facilitate better hearing-health management in this population. The first barrier they face is accessibility of technologies. There is limited availability of user-friendly devices, problems of compatibility with other assistive technologies, and difficulties in going through health systems to avail themselves of hearing-care services (Hughes et al., 2024; Sewell et al., 2024).

CONCLUSIONS:

The younger the age and the lesser the Perceived Barriers, the greater the Self-Efficacy of using hearing aids.

The greater the Cues-to-Action and Perceived Susceptibility, the greater the Self-Efficacy for using hearing aids.

Married participants have greater Perceived Susceptibility of hearing loss and greater Cues-To-Action to use hearing aids.

The lower the level of education, the greater the Perceived Susceptibility to develop hearing loss.

The higher the level of education, the greater the Perceived Benefits and the Perceived Self-Efficacy of using hearing aids.

The poorer the general health, the greater the Perceived Severity of hearing loss and the Cues-To-Action to use hearing aids.

The better the general health, the greater the Perceived Self-Efficacy of using hearing aids.

The Perceived Susceptibility would be greater among participants who use hearing aids.

The Perceived Severity and Perceived Barriers would be greater among participants who reported that they have DM.

RELEVANCE OF CLINICAL PRACTICE:

This study can establish the foundation for further empirical studies that seek to improve older adults; beliefs to use hearing aids.

STRENGTHS

The strengths of this study include it is the first in Iraq, Arab countries, and the Middle East region that sought to identify factors that predict older adults' Self-Efficacy of using hearing aids and it may provide the basis for future empirical studies that aim to encourage older adults to use hearing aids. The only available review has used the Trans theoretical Model of Change to examine attitudes and behavior of adults with hearing loss. Hence, the researcher cannot compare/contrast the findings of the current study with other studies.

Limitations

This study involves some limitations including using a convenience sampling that does represent the population of older adults, and it used the self-reported tool for data collection which entail bias of expressing the precise health condition relevant to hearing health.

Conflict of Interest: I undersign, certificate that I do not have any financial or personal relationships that might bias the content of this work.

Funding: This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data Availability Statement

The researcher declares that the data supporting the results reported in the article can be found.

Study Strengths:

- This study is the first that used the Health Belief Model to explore older adults' beliefs about using hearing aids.
- This study can establish the foundation for further empirical studies that seek to improve older adults; beliefs to use hearing aids.
- Perceived Barriers, Cues-to-Action, and Perceived Susceptibility can predict participants' intention to use hearing aids.

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TABLES:

Table (1): Participants' sociodemographic characteristics (N = 306)

Variable		Frequency	Percent
Age (Years)	60-96	158	51.6
	70-79	116	37.9
	≥ 80	32	10.5
	Mean (SD): 69.27 ± 6.83		
Gender	Male	188	61.4
	Female	118	38.6
Marital Status	Unmarried	44	14.4
	Married	126	41.2
	Widow/Widower	78	25.5
	Divorced	58	19.0
Level of education	Read and write	122	39.9
	Elementary school	64	20.9
	Middle school	30	9.8
	High school	34	11.1
	Associate degree	20	6.5
	Bachelor's degree	36	11.8

Table (2): Participants' medical profile

Variable		Frequency	Percent
Do you use hearing aids?	Yes	34	11.1
	No	272	88.9
Did the physician tell you that you have DM?	Yes	84	27.5
	No	222	72.5
How would you describe your general health?	Poor	64	20.9
	Fair	160	52.3
	Good	76	24.8
	Excellent	6	2.0

Table (3): Stepwise regression for the factors predicting Self-Efficacy for using hearing aids

Coefficients [a]								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
		B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
1	**(Constant)**	26.816	4.222		6.352	.000		
	Age	-.119	.061	-.112	-1.958	.051	1.000	1.000
2	**(Constant)**	5.528	4.575		1.208	.228		
	Age	-.122	.054	-.114	-2.256	.025	.966	1.036
	Perceived Susceptibility	.228	.045	.259	5.051	.000	.940	1.063
	Perceived Severity	.075	.095	.042	.795	.427	.895	1.117
	Perceived Benefits	.009	.053	.010	.179	.858	.783	1.278
	Perceived Barriers	-.088	.029	.166	3.074	.002	.853	1.173
	Cues to Action	.421	.064	.359	6.566	.000	.830	1.205

a. Dependent Variable: Perceived Self-Efficacy**.**

Table (4): Differences in the HBM constructs among the marital status groups.

ANOVA						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Perceived Susceptibility	Between Groups	819.274	3	273.091	4.098	.007
	Within Groups	20123.785	302	66.635		
	Total	**20943.059**	**305**			
Perceived Severity	Between Groups	236.477	3	78.826	5.001	.002
	Within Groups	4760.464	302	15.763		
	Total	**4996.941**	**305**			
Perceived Benefits	Between Groups	24.319	3	8.106	.133	.940
	Within Groups	18384.622	302	60.876		
	Total	**18408.941**	**305**			
Perceived Barriers	Between Groups	800.701	3	266.900	1.440	.231
	Within Groups	55966.358	302	185.319		
	Total	**56767.059**	**305**			
Cues to Action	Between Groups	428.423	3	142.808	3.832	.010
	Within Groups	11255.342	302	37.269		
	Total	**11683.765**	**305**			

	Between Groups	45.148	3	15.049	.283	.838
Perceived Self-Efficacy	Within Groups	16080.970	302	53.248		
	Total	**16126.118**	**305**			

df = Degree of freedom; F = F-statistics; Sig. = Significance.

Table (5): Differences in the HBM constructs among the level of education groups

ANOVA						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Perceived Susceptibility	Between Groups	941.616	6	156.936	2.346	.031
	Within Groups	20001.443	299	66.894		
	Total	**20943.059**	**305**			
Perceived Severity	Between Groups	102.036	6	17.006	1.039	.400
	Within Groups	4894.905	299	16.371		
	Total	**4996.941**	**305**			
Perceived Benefits	Between Groups	1172.649	6	195.442	3.390	.003
	Within Groups	17236.292	299	57.646		
	Total	**18408.941**	**305**			
Perceived Barriers	Between Groups	2353.504	6	392.251	2.155	.047
	Within Groups	54413.555	299	181.985		
	Total	**56767.059**	**305**			
Cues to Action	Between Groups	330.272	6	55.045	1.450	.195
	Within Groups	11353.493	299	37.972		
	Total	**11683.765**	**305**			
Perceived Self-Efficacy	Between Groups	746.484	6	124.414	2.419	.027
	Within Groups	15379.634	299	51.437		
	Total	**16126.118**	**305**			

df = Degree of freedom; F = F-statistics; Sig. = Significance.

Table (6): Differences in the HBM constructs among the general health groups

ANOVA						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Perceived Susceptibility	Between Groups	246.862	3	82.287	1.201	.310
	Within Groups	20696.197	302	68.530		
	Total	**20943.059**	**305**			
Perceived Severity	Between Groups	249.602	3	83.201	5.293	.001
	Within Groups	4747.339	302	15.720		
	Total	**4996.941**	**305**			
Perceived Benefits	Between Groups	431.043	3	143.681	2.414	.067
	Within Groups	17977.898	302	59.529		
	Total	**18408.941**	**305**			
Perceived Barriers	Between Groups	1146.230	3	382.077	2.075	.104
	Within Groups	55620.829	302	184.175		
	Total	**56767.059**	**305**			
Cues to Action	Between Groups	394.632	3	131.544	3.519	.015
	Within Groups	11289.133	302	37.381		
	Total	**11683.765**	**305**			
Perceived Self-Efficacy	Between Groups	1035.242	3	345.081	6.906	.000

Within Groups	15090.876	302	49.970	
Total	**16126.118**	**305**		

df = Degree of freedom; F = F-statistics; Sig. = Significance.

Table (7): Differences in the HBM constructs between gender groups

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perceived Susceptibility	**Equal variances assumed**	2.835	.093	2.891	304	.004	2.780	.962	.888	4.673
	Equal variances not assumed			2.793	220.912	.006	2.780	.995	.819	4.742
Perceived Severity	**Equal variances assumed**	8.135	.005	.646	304	.519	.307	.476	-.629	1.244
	Equal variances not assumed			.685	291.415	.494	.307	.449	-.576	1.190
Perceived Benefits	**Equal variances assumed**	2.907	.089	-2.318	304	.021	-2.100	.906	-3.883	-.318
	Equal variances not assumed			-2.452	289.831	.015	-2.100	.857	-3.787	-.414
Perceived Barriers	**Equal variances assumed**	1.237	.267	1.277	304	.202	2.045	1.601	-1.105	5.194
	Equal variances not assumed			1.240	224.718	.216	2.045	1.649	-1.204	5.294
Cues to Action	**Equal variances assumed**	2.456	.118	-1.396	304	.164	-1.013	.726	-2.441	.415
	Equal variances not assumed			-1.446	276.427	.149	-1.013	.701	-2.392	.366
Perceived Self-Efficacy	**Equal variances assumed**	3.358	.068	-2.485	304	.013	-2.105	.847	-3.771	-.438
	Equal variances not assumed			-2.375	212.400	.018	-2.105	.886	-3.852	-.358

df = Degree of freedom; F = F-statistics; Sig. = Significance; t = T-statistics; Std. Error Difference = Standard Error Difference.

Table (8): Differences in the HBM constructs between using hearing aid groups

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perceived Susceptibility	Equal variances assumed	8.859	.003	2.314	304	.021	3.463	1.497	.518	6.408
	Equal variances not assumed			3.446	60.161	.001	3.463	1.005	1.453	5.474
Perceived Severity	Equal variances assumed	.000	.998	-.060	304	.952	-.044	.737	-1.495	1.407
	Equal variances not assumed			-.060	41.813	.952	-.044	.734	-1.525	1.436
Perceived Benefits	Equal variances assumed	3.006	.084	-.577	304	.564	-.816	1.415	-3.600	1.968
	Equal variances not assumed			-.820	56.514	.415	-.816	.995	-2.809	1.176
Perceived Barriers	Equal variances assumed	1.960	.163	-.933	304	.351	-2.316	2.482	-7.201	2.568
	Equal variances not assumed			-1.084	46.078	.284	-2.316	2.136	-6.615	1.983
Cues to Action	Equal variances assumed	.001	.975	-.078	304	.938	-.088	1.128	-2.307	2.131
	Equal variances not assumed			-.076	41.062	.940	-.088	1.159	-2.430	2.253
Perceived Self-Efficacy	Equal variances assumed	.161	.688	1.353	304	.177	1.787	1.321	-.812	4.386
	Equal variances not assumed			1.355	41.728	.183	1.787	1.319	-.875	4.448

df = Degree of freedom; F = F-statistics; Sig. = Significance; t = T-statistics; Std. Error Difference = Standard Error Difference.

Table (9): Differences in the HBM constructs between having diabetes mellitus groups

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perceived Susceptibility	Equal variances assumed	.089	.765	1.452	304	.148	1.539	1.060	-.546	3.624
	Equal variances not assumed			1.461	151.437	.146	1.539	1.053	-.542	3.620
Perceived Severity	Equal variances assumed	2.794	.096	2.135	304	.034	1.100	.516	.086	2.115
	Equal variances not assumed			2.138	150.143	.034	1.100	.515	.084	2.117
Perceived Benefits	Equal variances assumed	.215	.644	.740	304	.460	.737	.996	-1.222	2.697
	Equal variances not assumed			.768	161.161	.444	.737	.961	-1.159	2.634
Perceived Barriers	Equal variances assumed	.601	.439	2.209	304	.028	3.836	1.737	.419	7.253
	Equal variances not assumed			2.205	149.127	.029	3.836	1.740	.398	7.273
Cues to Action	Equal variances assumed	1.782	.183	.996	304	.320	.790	.793	-.771	2.350
	Equal variances not assumed			1.023	158.070	.308	.790	.772	-.735	2.314
Perceived Self-Efficacy	Equal variances assumed	5.892	.016	1.600	304	.111	1.486	.929	-.342	3.315
	Equal variances not assumed			1.761	184.270	.080	1.486	.844	-.178	3.151

df = Degree of freedom; F = F-statistics; Sig. = Significance; t = T-statistics; Std. Error Difference = Standard Error Difference.