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Knowledge, Attitude & Practices regarding Hearing Loss and its prevention among the general Population of Haryana: A Community Based Study.

Dr. Shifali Khosla[1]*, Dr. Nidhi Bhardwaj[2], Dr. Nitish Khosla[3].

[1]Assistant Professor, Department of ENT, Maharishi Markandeshwar Medical College & Hospital (MMCMSR), Sadopur, Ambala, Haryana, India.

[2]Assistant Professor, Department of ENT, Veer Chandra Singh Garhwali Government Medical College (VCSG GMC), Srinagar, Garhwal, Uttarakhand, India.

[3]Assistant Professor, Department of Orthopedics, Maharishi Markandeshwar Medical College & Hospital (MMCMSR), Sadopur, Ambala, Haryana, India.

Correspondence:
Dr. Shifali Khosla.
Assistant Professor, Department of ENT, Maharishi Markandeshwar Medical College & Hospital (MMCMSR), Sadopur, Ambala, Haryana, India.)

Email:
shifalichhabra27@gmail.com

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Abstract

Background: Hearing loss is a growing public health concern with significant social, psychological, and economic consequences. A substantial proportion of hearing impairment is preventable through awareness and adoption of safe listening practices. However, knowledge, attitudes, and preventive behaviors related to hearing loss remain inadequately explored in many regions, including Haryana. ***Objective:*** To assess the knowledge, attitude, and practices (KAP) regarding hearing loss and its prevention among the general population of Haryana. ***Methods:*** A community-based cross-sectional study was conducted over a period of four months using a structured, self-administered Google Form questionnaire. Adults aged ≥18 years residing in Haryana were included, excluding healthcare professionals. A total of 420 valid responses were analyzed. The questionnaire assessed socio-demographic characteristics, knowledge (20 items), attitude (20 statements), and practices (20 items) related to hearing loss and its prevention. Data were analyzed using descriptive statistics, Chi-square test, and Pearson's correlation coefficient, with a significance level set at $p<0.05$. ***Results:*** The majority of participants were aged 26–35 years (28.6%), female (53.3%), and urban residents (71.0%). Knowledge levels were predominantly good (44.3%) or excellent (23.3%), with high awareness of causes and prevention of hearing loss. Attitude was largely positive, with 24.3% showing positive and 46.2% moderate attitudes toward hearing health. However, practices were suboptimal, with only 21.0% demonstrating good preventive behaviors, while risky practices such as high-volume earphone use and inadequate hearing protection were common. Significant associations were observed between KAP scores and education, occupation, income, and age ($p<0.05$). Knowledge showed a positive correlation with attitude ($r=0.472$) and practices ($r=0.558$), while attitude also correlated with practices ($r=0.438$) ($p<0.01$). ***Conclusion:*** Although knowledge and attitudes regarding hearing loss are relatively favorable among the general population of Haryana, the adoption of safe preventive practices remains inadequate. Strengthening public awareness, promoting behavioral change, and improving access topreventive services are essential to reduce the burden of preventable hearing loss.

Keywords: Hearing loss; Knowledge, Attitude, and Practices (KAP); Hearing loss prevention; Public awareness; Community-based study; Haryana.

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INTRODUCTION

Hearing loss is an increasingly recognized global public health concern with profound medical, social, and economic implications. The World Health Organization estimates that over 1.5 billion individuals worldwide experience some degree of hearing impairment, of whom nearly 430 million require rehabilitation services.1-3 This burden is projected to escalate further due to population aging, urbanization, and widespread exposure to environmental and recreational noise. Beyond its clinical dimension, hearing loss significantly compromises communication ability, educational attainment, employment opportunities, and psychosocial well-being, thereby contributing to long-term disability and reduced quality of life.4-6

Importantly, a substantial proportion of hearing loss is preventable. Noise-induced hearing loss, one of the most common forms, has emerged as a critical concern in both developed and developing nations.7,8 Rapid technological advancements, including the ubiquitous use of personal listening devices, increased exposure to amplified music, occupational noise in industrial settings, and urban environmental noise, have amplified the risk among younger and working-age populations.

Despite the availability of preventive measures—such as safe listening practices, use of protective devices, and early screening—awareness and adoption of these strategies remain suboptimal.9,10

In the Indian context, hearing impairment constitutes a significant yet often neglected public health issue. Limited awareness, social stigma, delayed diagnosis, and inadequate access to audiological services further exacerbate its impact.11-13 Haryana, a rapidly developing state with expanding industrialization and urbanization, presents a unique setting where environmental and occupational noise exposure may be increasing. However, community-level awareness regarding hearing health, preventive practices, and early healthcare-seeking behavior remains inadequately explored. Assessment of Knowledge, Attitude, and Practices (KAP) provides a comprehensive framework for understanding how individuals perceive and respond to health-related issues. Knowledge reflects awareness and understanding of hearing loss and its risk factors; attitude encompasses beliefs, perceptions, and readiness to adopt preventive measures; while practices represent actual behaviors related to hearing protection and healthcare utilization. Disparities between knowledge and practice are frequently observed, where individuals may be aware of risks but fail to adopt protective behaviors due to misconceptions, negligence, or socio-cultural influences.

Existing literature suggests that although general awareness of hearing loss may be present, critical gaps persist in understanding preventable risk factors such as prolonged exposure to high-decibel sound, unsafe use of earphones, and the importance of routine hearing evaluation.14-17 Furthermore, attitudes toward hearing protection are often influenced by perceived susceptibility, social norms, and accessibility of healthcare services. These gaps collectively contribute to the growing burden of preventable hearing impairment. Given the preventable nature of a significant proportion of hearing loss and its far-reaching consequences, it is essential to evaluate community-level knowledge, attitudes, and practices to inform targeted public health interventions. However, there is a paucity of region-specific data assessing these dimensions among the general population of Haryana. Therefore, the present study aims to assess the knowledge, attitude, and practices regarding hearing loss and its prevention among the general population of Haryana through a community-based approach. The findings of this study are expected to identify critical gaps in awareness and behavior, thereby providing evidence for designing effective educational strategies, strengthening preventive measures, and promoting hearing health at the population level.

MATERIALS AND METHODS

Study Design and Setting

A community-based descriptive cross-sectional study was conducted to assess the knowledge, attitude, and practices (KAP) regarding hearing loss and its prevention among the general population of Haryana, India. The study was carried out over a period of four months (September to December, 2025) using a structured, self-administered online questionnaire. The digital mode of data collection was adopted to facilitate wider geographic reach, ease of participation, and rapid data acquisition across different regions of the state.

Study Population

The study population comprised adults aged 18 years and above who had been residing in Haryana for at least one year prior to participation. Participants were required to have access to a smartphone or computer and the ability to read and understand the questionnaire independently.

Inclusion Criteria

- Adults aged ≥18 years
- Residents of Haryana for ≥1 year
- Willing to participate and provide digital informed consent
- Able to complete an online questionnaire independently

Exclusion Criteria

- Healthcare professionals (doctors, audiologists, ENT specialists, nurses, and medical students) to avoid professional knowledge bias
- Individuals with known severe hearing impairment affecting comprehension
- Incomplete or duplicate responses
- Respondents residing outside Haryana

Sample Size Determination

The sample size was calculated using the single population proportion formula, assuming a 50% prevalence of adequate knowledge regarding hearing loss prevention (due to lack of prior regional data), with a 95% confidence interval and a 5% margin of error. The minimum required sample size was estimated to be 384 participants. To improve precision and compensate for incomplete responses, the final target sample size was increased to 420 participants.

Sampling Technique and Data Collection

A non-probability convenience sampling technique was used. Data were collected exclusively through an online Google Form questionnaire. The survey link was disseminated via multiple digital platforms, including WhatsApp, email, and social media groups, as well as through community networks and educational institutions across Haryana. The first section of the Google Form contained a brief description of the study objectives, assurance of confidentiality, and a digital informed consent statement. Only participants who provided consent were allowed to proceed to the questionnaire. The average time required to complete the survey was approximately 8–12 minutes. To ensure data quality, duplicate entries were restricted using Google Form settings, and incomplete responses were excluded from analysis.

Data Collection Instrument

A structured and pre-tested questionnaire was developed based on a comprehensive review of relevant literature on hearing loss awareness, prevention strategies, and KAP studies. The questionnaire was designed in simple, non-technical language to ensure clarity and accessibility for the general population.

The instrument consisted of four sections:

Section I: Socio-Demographic Characteristics

This section included variables such as age, gender, educational status, occupation, monthly household income, and area of residence (urban/semi-urban/rural).

Section II: Knowledge Regarding Hearing Loss and Its Prevention

This section assessed participants' awareness regarding:

- Causes of hearing loss (noise exposure, infections, aging, ototoxic drugs)
- Risk factors (prolonged headphone use, loud environments, occupational exposure)
- Early symptoms (hearing difficulty, tinnitus)
- Preventive measures (safe listening practices, ear protection, regular hearing check-ups)

Each correct response was awarded one point, while incorrect or "don't know" responses were scored zero.

Section III: Attitude Toward Hearing Loss and Prevention

Participants' attitudes were evaluated using statements related to:

- Perceived seriousness of hearing loss
- Perceived susceptibility to hearing impairment
- Importance of preventive measures
- Willingness to adopt safe listening behaviors
- Healthcare-seeking attitudes

Responses were recorded using a three-point Likert scale (Agree, Neutral, Disagree), and appropriate responses were scored accordingly.

Section IV: Practices Related to Hearing Health

This section assessed behavioral patterns, including:

- Use of earphones/headphones and listening habits
- Exposure to loud noise environments
- Use of hearing protection measures
- Frequency of hearing check-ups
- Response to hearing-related symptoms

Responses were analyzed to determine safe and unsafe practices.

Scoring Criteria

Knowledge Score

- Excellent: ≥75% correct responses
- Good: 50–74%
- Fair: 25–49%
- Poor: <25%

Attitude Score

- Positive attitude
- Moderate attitude
- Neutral/mixed attitude
- Negative attitude

Practice Score
- Good practices
- Moderate practices
- Poor practices

Validation and Reliability
The questionnaire underwent content and face validation by a panel of experts, including an otorhinolaryngologist (ENT specialist), a public health expert, and a biostatistician. Necessary revisions were made to ensure clarity, relevance, and scientific accuracy. A pilot study was conducted among 40 participants (excluded from final analysis) to evaluate feasibility and comprehension. Reliability testing demonstrated good internal consistency, with Cronbach's alpha ≥0.80.

Data Management and Statistical Analysis
Data collected through Google Forms were exported to Microsoft Excel for cleaning and coding. Statistical analysis was performed using IBM SPSS Statistics (Version 26.0).
Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize socio-demographic variables and KAP scores. Inferential statistics included:
- Chi-square test to assess associations between KAP variables and socio-demographic factors
- Pearson's correlation coefficient to determine relationships among knowledge, attitude, and practice scores

A p-value of <0.05 was considered statistically significant.

Ethical Considerations
Participation was voluntary, and digital informed consent was obtained prior to questionnaire completion. Anonymity and confidentiality were strictly maintained, and no personal identifiers were collected. Data were used solely for research purposes in accordance with ethical guidelines for human subject research.

RESULTS
The study included 420 participants, with the majority belonging to the 26–35 years age group (28.6%), followed by 18–25 years (25.7%). Females constituted a slightly higher proportion (53.3%) compared to males. Most participants were graduates (42.4%) or postgraduates (37.6%), indicating a relatively well-educated population. In terms of occupation, a significant proportion were service/professionals (38.6%), followed by homemakers and students. The majority of respondents reported a monthly household income between ₹25,001–50,000 (32.9%), and most resided in urban areas (71.0%), reflecting a predominantly urban and educated study cohort.

TABLE 1: Socio-Demographic Characteristics of Study Participants (n = 420)

Variable	Category	Frequency (n)	Percentage (%)
Age Group (years)	18–25	108	25.7
	26–35	120	28.6
	36–45	92	21.9
	46–60	66	15.7
	>60	34	8.1
Gender	Male	196	46.7
	Female	224	53.3
Educational Level	Up to Secondary (≤10+2)	84	20.0
	Graduate	178	42.4
	Postgraduate & Above	158	37.6
Occupation	Student	76	18.1
	Service/Professional	162	38.6
	Homemaker	88	21.0
	Self-employed/Business	64	15.2
	Retired/Unemployed	30	7.1
Monthly Household Income (INR)	<25,000	78	18.6
	25,001–50,000	138	32.9
	50,001–75,000	116	27.6
	>75,000	88	21.0
Area of Residence	Urban	298	71.0
	Semi-Urban	122	29.0

Knowledge regarding hearing loss and its prevention was generally moderate to good among participants. High awareness was observed regarding causes of hearing loss (82.4%), preventive measures (83.8%), and the impact of hearing loss on communication and social life (85.2%). A substantial proportion correctly identified harmful effects of prolonged exposure to loud noise and unsafe earphone use. However, knowledge gaps were evident in specific areas such as the concept of the 60/60 safe listening rule (53.3%), ototoxic medications (56.2%), and age-related hearing loss (57.6%), indicating incomplete understanding of certain technical and preventive aspects.

TABLE 2: Knowledge Regarding Hearing Loss and Its Prevention Among the General Population of Haryana (n = 420)

Q No.	Question	Options	Correct n (%)
1	Hearing loss can be caused by	a) Loud noise b) Infection c) Aging d) **All of the above**	346 (82.4)
2	Prolonged use of earphones at high volume can lead to	a) **Hearing loss** b) Vision loss c) Headache only d) No effect	332 (79.0)
3	Which is an early symptom of hearing loss?	a) Fever b) **Tinnitus (ringing in ears)** c) Cough d) Weakness	298 (71.0)
4	Safe listening level for earphones should be	a) Maximum volume b) **Moderate volume** c) Very low only d) No limit	274 (65.2)
5	Noise-induced hearing loss is	a) Temporary always b) **Permanent in many cases** c) Not serious d) Rare	286 (68.1)
6	Exposure to loud noise for long duration can	a) Improve hearing b) **Damage hearing** c) No effect d) Cure ear problems	338 (80.5)
7	Ear protection devices (earplugs/earmuffs) are used to	a) Increase sound b) **Reduce noise exposure** c) Clean ears d) Treat infection	310 (73.8)
8	Hearing loss can be prevented by	a) Avoiding loud noise b) Safe listening habits c) Regular check-ups d) **All of the above**	352 (83.8)
9	Which group is more vulnerable to hearing loss?	a) Children b) Elderly c) Workers in noisy areas d) **All of the above**	304 (72.4)
10	Listening to music at high volume for long time is	a) Safe b) **Harmful to hearing** c) Beneficial d) Recommended	330 (78.6)
11	Hearing loss due to aging is called	a) Otitis b) **Presbycusis** c) Tinnitus d) Vertigo	242 (57.6)
12	Regular hearing check-ups are important for	a) **Early detection** b) Cosmetic reasons c) No use d) Entertainment	296 (70.5)
13	Using cotton buds frequently can	a) Improve hearing b) **Damage ear canal** c) Clean deeply safely d) No effect	268 (63.8)
14	Sudden hearing loss requires	a) **Immediate medical attention** b) Home remedy only c) Ignoring d) Self-medication	314 (74.8)
15	Ototoxic drugs can	a) Improve hearing b) **Cause hearing damage** c) Strengthen ear d) No effect	236 (56.2)
16	Hearing loss can affect	a) Communication b) Education c) Social life d) **All of the above**	358 (85.2)
17	Children with untreated hearing loss may have	a) **Speech delay** b) Normal development c) Strong immunity d) No effect	322 (76.7)
18	Noise from traffic and industries can	a) Improve hearing b) **Cause hearing loss** c) No impact d) Cure ear disease	306 (72.9)
19	Safe listening rule (60/60 rule) means	a) **60 min at 60% volume** b) 60 hrs listening c) Full volume d) No rule	224 (53.3)
20	Hearing aids are used to	a) Cure hearing loss completely b) **Improve hearing ability** c) Prevent infection d) Replace ear	278 (66.2)

Attitude toward hearing loss and its prevention was largely positive among participants. A majority agreed that hearing loss is a serious health concern (75.7%) and significantly affects quality of life (79.0%). Most respondents acknowledged the importance of safe listening practices, early medical consultation, and hearing protection in noisy environments. Additionally, strong support was observed for increasing public awareness (82.9%) and government-led initiatives (84.8%). However, moderate misconceptions persisted regarding susceptibility among younger individuals and the necessity of protective measures, indicating scope for behavioral change interventions.

TABLE 3: Attitude Toward Hearing Loss and Its Prevention Among the General Population of Haryana (n = 420)

Q No.	Statement	Response Options	Correct Response n (%)
1	Hearing loss is a serious health problem.	a) **Agree** b) Neutral c) Disagree	318 (75.7)
2	Hearing loss affects quality of life.	a) **Agree** b) Neutral c) Disagree	332 (79.0)
3	Young people are not at risk of hearing loss.	a) **Disagree** b) Neutral c) Agree	286 (68.1)
4	Using earphones at high volume is harmful.	a) **Agree** b) Neutral c) Disagree	324 (77.1)
5	Hearing protection is necessary in noisy environments.	a) **Agree** b) Neutral c) Disagree	306 (72.9)
6	Hearing loss cannot be prevented.	a) **Disagree** b) Neutral c) Agree	272 (64.8)
7	Regular hearing check-ups are important.	a) **Agree** b) Neutral c) Disagree	298 (71.0)
8	People with hearing loss should seek medical help early.	a) **Agree** b) Neutral c) Disagree	314 (74.8)
9	Hearing loss is a normal part of life and cannot be avoided.	a) **Disagree** b) Neutral c) Agree	268 (63.8)
10	Loud environments (music events, traffic) can damage hearing.	a) **Agree** b) Neutral c) Disagree	326 (77.6)
11	Hearing protection devices are uncomfortable and unnecessary.	a) **Disagree** b) Neutral c) Agree	254 (60.5)
12	Awareness about hearing loss prevention should be increased.	a) **Agree** b) Neutral c) Disagree	348 (82.9)
13	Ignoring early symptoms of hearing loss is acceptable.	a) **Disagree** b) Neutral c) Agree	290 (69.0)
14	Children are more vulnerable to hearing damage.	a) **Agree** b) Neutral c) Disagree	276 (65.7)
15	Hearing loss can lead to social isolation.	a) **Agree** b) Neutral c) Disagree	302 (71.9)
16	Safe listening habits should be followed daily.	a) **Agree** b) Neutral c) Disagree	318 (75.7)
17	Earphones should not be used for long durations.	a) **Agree** b) Neutral c) Disagree	296 (70.5)
18	People are generally careless about hearing health.	a) **Agree** b) Neutral c) Disagree	284 (67.6)
19	Early treatment can prevent worsening of hearing loss.	a) **Agree** b) Neutral c) Disagree	322 (76.7)
20	Government should promote hearing health awareness programs.	a) **Agree** b) Neutral c) Disagree	356 (84.8)

Practice patterns related to hearing loss prevention were variable and less optimal compared to knowledge and attitude. A majority of participants reported regular use of earphones (73.3%), with a considerable proportion listening at high volume levels (42.4%) and being exposed to loud environments (64.8%).

Adoption of safe practices such as limiting listening duration (43.8%), following safe listening rules (38.6%), and using hearing protection devices (32.9%) was relatively low. Although 59.0% reported consulting a doctor for hearing-related issues, only 37.1% had undergone hearing check-ups.

Risky behaviors such as frequent use of cotton buds (56.7%) and ignoring early symptoms (51.0%) were also observed.

TABLE 4: Practices Related to Hearing Loss and Its Prevention Among the General Population of Haryana (n = 420)

Q No.	Question	Options	n (%)
1	Do you use earphones/headphones regularly?	a) Yes b) **No**	308 (73.3)
2	If yes, how often do you use them?	a) Daily b) Occasionally c) **Rarely**	196 (46.7)
3	At what volume do you usually listen?	a) High (>70%) b) **Moderate (40–70%)** c) Low (<40%)	178 (42.4)
4	Do you follow safe listening practices (e.g., 60/60 rule)?	a) **Yes** b) No	162 (38.6)
5	Do you limit the duration of earphone use?	a) **Yes** b) No	184 (43.8)
6	Are you exposed to loud noise (traffic/work/music)?	a) Yes b) **No**	272 (64.8)
7	Do you use hearing protection (earplugs/earmuffs) in noisy environments?	a) **Yes** b) No	138 (32.9)
8	Have you ever experienced symptoms like ringing in ears (tinnitus)?	a) Yes b) **No**	202 (48.1)
9	If you experience hearing problems, do you consult a doctor?	a) **Yes** b) No	248 (59.0)
10	Have you ever undergone a hearing check-up?	a) **Yes** b) No	156 (37.1)
11	Do you avoid listening to loud music for long durations?	a) **Yes** b) No	192 (45.7)
12	Do you reduce volume when using earphones?	a) **Yes** b) No	204 (48.6)
13	Do you take breaks while using headphones?	a) **Yes** b) No	176 (41.9)
14	Do you attend loud music events frequently?	a) Yes b) **No**	148 (35.2)
15	Do you encourage others to follow safe hearing practices?	a) **Yes** b) No	210 (50.0)
16	Do you use cotton buds regularly for ear cleaning?	a) Yes b) **No**	238 (56.7)
17	Have you ever ignored early symptoms of hearing loss?	a) Yes b) **No**	214 (51.0)
18	Do you seek information about hearing health online?	a) **Yes** b) No	186 (44.3)
19	Would you adopt safer listening habits if informed?	a) **Yes** b) No	312 (74.3)
20	Do you believe your current hearing practices are safe?	a) **Yes** b) No	226 (53.8)

Overall, knowledge scores were predominantly good (44.3%) or excellent (23.3%), indicating a satisfactory level of awareness among participants. Attitude scores showed that most participants had moderate (46.2%) to positive attitudes (24.3%) toward hearing health.

However, practice scores were comparatively lower, with only 21.0% demonstrating good preventive practices and nearly half exhibiting moderate practices (47.1%).

The mean scores further suggest that while knowledge and attitudes are relatively favorable, their translation into appropriate preventive behaviors remains suboptimal.

TABLE 5: Overall Knowledge, Attitude, and Practice (KAP) Score Distribution Among the General Population of Haryana (n = 420)

Level	Score Range (out of 20)	Knowledge n (%)	Attitude n (%)	Practice n (%)
Excellent / Positive / Good (≥75%)	15–20	98 (23.3)	102 (24.3)	88 (21.0)
Good / Moderate / Moderate (50–74%)	10–14	186 (44.3)	194 (46.2)	198 (47.1)
Fair / Neutral / Low (25–49%)	5–9	94 (22.4)	82 (19.5)	90 (21.4)
Poor / Negative / Poor (<25%)	0–4	42 (10.0)	42 (10.0)	44 (10.5)
Mean ± SD	—	**13.5 ± 3.2**	**13.2 ± 3.4**	**12.8 ± 3.6**

Knowledge regarding hearing loss showed statistically significant associations with age (p=0.004), educational level (p<0.001), occupation (p=0.005), and monthly income (p=0.006). Higher knowledge levels were observed among older participants, those with higher educational attainment, professionals, and individuals with higher income levels. Gender and area of residence did not show significant associations, although urban participants demonstrated relatively better knowledge trends compared to semi-urban residents.

TABLE 6: Association Between Socio-Demographic Variables and Knowledge Regarding Hearing Loss Among the General Population of Haryana (n = 420)

Variable	Category	Excellent n (%)	Good n (%)	Fair n (%)	Poor n (%)	χ^2 value	p-value
Age Group (years)	18–25 (n=108)	18 (16.7)	46 (42.6)	28 (25.9)	16 (14.8)	15.62	0.004*
	26–35 (n=120)	28 (23.3)	56 (46.7)	26 (21.7)	10 (8.3)		
	36–45 (n=92)	24 (26.1)	40 (43.5)	20 (21.7)	8 (8.7)		
	46–60 (n=66)	18 (27.3)	28 (42.4)	14 (21.2)	6 (9.1)		
	>60 (n=34)	10 (29.4)	16 (47.1)	6 (17.6)	2 (5.9)		
Gender	Male (n=196)	44 (22.4)	86 (43.9)	42 (21.4)	24 (12.3)	2.12	0.548
	Female (n=224)	54 (24.1)	100 (44.6)	52 (23.2)	18 (8.1)		
Educational Level	Up to Secondary (n=84)	8 (9.5)	26 (31.0)	32 (38.1)	18 (21.4)	31.48	<0.001*
	Graduate (n=178)	34 (19.1)	88 (49.4)	38 (21.3)	18 (10.2)		
	Postgraduate & Above (n=158)	56 (35.4)	72 (45.6)	24 (15.2)	6 (3.8)		
Occupation	Student (n=76)	12 (15.8)	34 (44.7)	20 (26.3)	10 (13.2)	18.36	0.005*
	Service/Professional (n=162)	48 (29.6)	74 (45.7)	26 (16.0)	14 (8.7)		
	Homemaker (n=88)	14 (15.9)	38 (43.2)	26 (29.5)	10 (11.4)		
	Self-employed (n=64)	14 (21.9)	28 (43.8)	14 (21.9)	8 (12.5)		
	Retired/Unemployed (n=30)	10 (33.3)	12 (40.0)	8 (26.7)	0 (0.0)		
Monthly Income (INR)	<25,000 (n=78)	8 (10.3)	28 (35.9)	24 (30.8)	18 (23.0)	17.94	0.006*
	25,001–50,000 (n=138)	24 (17.4)	66 (47.8)	32 (23.2)	16 (11.6)		
	50,001–75,000 (n=116)	30 (25.9)	52 (44.8)	24 (20.7)	10 (8.6)		
	>75,000 (n=88)	36 (40.9)	40 (45.5)	14 (15.9)	0 (0.0)		

Area of Residence	Urban (n=298)	78 (26.2)	136 (45.6)	56 (18.8)	28 (9.4)	6.82	0.078
	Semi-Urban (n=122)	20 (16.4)	50 (41.0)	38 (31.1)	14 (11.5)		

Attitude toward hearing loss and its prevention was significantly associated with age (p=0.006), educational level (p<0.001), occupation (p=0.010), and monthly income (p=0.011).

Participants with higher education and income levels exhibited more positive attitudes toward hearing health and preventive practices. Professionals demonstrated better attitude scores compared to other occupational groups.

However, gender and area of residence were not statistically significant, although urban participants showed relatively more favorable attitudes.

TABLE 7: Association Between Socio-Demographic Variables and Attitude Toward Hearing Loss and Its Prevention Among the General Population of Haryana (n = 420)

Variable	Category	Positive n (%)	Moderate n (%)	Neutral n (%)	Negative n (%)	χ^2 value	p-value
Age Group (years)	18–25 (n=108)	18 (16.7)	50 (46.3)	26 (24.1)	14 (13.0)	14.88	0.006*
	26–35 (n=120)	26 (21.7)	60 (50.0)	22 (18.3)	12 (10.0)		
	36–45 (n=92)	22 (23.9)	44 (47.8)	16 (17.4)	10 (10.9)		
	46–60 (n=66)	18 (27.3)	30 (45.5)	12 (18.2)	6 (9.0)		
	>60 (n=34)	18 (52.9)	10 (29.4)	4 (11.8)	2 (5.9)		
Gender	Male (n=196)	42 (21.4)	92 (46.9)	40 (20.4)	22 (11.3)	1.84	0.606
	Female (n=224)	60 (26.8)	102 (45.5)	42 (18.7)	20 (8.9)		
Educational Level	Up to Secondary (n=84)	8 (9.5)	30 (35.7)	28 (33.3)	18 (21.5)	28.62	<0.001*
	Graduate (n=178)	32 (18.0)	90 (50.6)	38 (21.3)	18 (10.1)		
	Postgraduate & Above (n=158)	62 (39.2)	74 (46.8)	16 (10.1)	6 (3.8)		
Occupation	Student (n=76)	14 (18.4)	36 (47.4)	18 (23.7)	8 (10.5)	16.72	0.010*
	Service/Professional (n=162)	50 (30.9)	74 (45.7)	24 (14.8)	14 (8.6)		
	Homemaker (n=88)	16 (18.2)	42 (47.7)	20 (22.7)	10 (11.4)		
	Self-employed (n=64)	14 (21.9)	30 (46.9)	14 (21.9)	6 (9.3)		
	Retired/Unemployed (n=30)	8 (26.7)	12 (40.0)	6 (20.0)	4 (13.3)		
Monthly Income (INR)	<25,000 (n=78)	8 (10.3)	32 (41.0)	20 (25.6)	18 (23.1)	16.48	0.011*
	25,001–50,000 (n=138)	26 (18.8)	70 (50.7)	28 (20.3)	14 (10.2)		
	50,001–75,000 (n=116)	30 (25.9)	54 (46.6)	24 (20.7)	8 (6.8)		
	>75,000 (n=88)	38 (43.2)	38 (43.2)	10 (11.4)	2 (2.2)		
Area of Residence	Urban (n=298)	84 (28.2)	136 (45.6)	50 (16.8)	28 (9.4)	7.14	0.068
	Semi-Urban (n=122)	18 (14.8)	58 (47.5)	32 (26.2)	14 (11.5)		

Practices related to hearing loss prevention were significantly associated with age (p=0.008), educational level (p<0.001), occupation (p=0.012), and monthly income (p=0.014).

Participants with higher education, professional occupations, and higher income levels demonstrated more appropriate preventive practices.

Younger individuals and those with lower educational status showed comparatively poorer practices. Gender and area of residence were not significantly associated, although urban participants exhibited slightly better practice patterns.

TABLE 8: Association Between Socio-Demographic Variables and Practices Related to Hearing Loss Prevention Among the General Population of Haryana (n = 420)

Variable	Category	Good n (%)	Moderate n (%)	Low n (%)	Poor n (%)	χ^2 value	p-value
Age Group (years)	18–25 (n=108)	16 (14.8)	52 (48.1)	24 (22.2)	16 (14.9)	13.92	0.008*
	26–35 (n=120)	26 (21.7)	62 (51.7)	20 (16.6)	12 (10.0)		
	36–45 (n=92)	22 (23.9)	46 (50.0)	16 (17.4)	8 (8.7)		
	46–60 (n=66)	16 (24.2)	30 (45.5)	12 (18.2)	8 (12.1)		
	>60 (n=34)	8 (23.5)	8 (23.5)	18 (52.9)	0 (0.0)		
Gender	Male (n=196)	40 (20.4)	96 (49.0)	34 (17.3)	26 (13.3)	2.06	0.561
	Female (n=224)	48 (21.4)	102 (45.5)	56 (25.0)	18 (8.1)		
Educational Level	Up to Secondary (n=84)	8 (9.5)	34 (40.5)	26 (31.0)	16 (19.0)	30.72	<0.001*
	Graduate (n=178)	30 (16.9)	96 (53.9)	34 (19.1)	18 (10.1)		
	Postgraduate & Above (n=158)	50 (31.6)	68 (43.0)	30 (19.0)	10 (6.4)		
Occupation	Student (n=76)	12 (15.8)	38 (50.0)	16 (21.0)	10 (13.2)	16.18	0.012*
	Service/Professional (n=162)	46 (28.4)	76 (46.9)	24 (14.8)	16 (9.9)		
	Homemaker (n=88)	12 (13.6)	44 (50.0)	22 (25.0)	10 (11.4)		
	Self-employed (n=64)	12 (18.8)	30 (46.9)	14 (21.8)	8 (12.5)		
	Retired/Unemployed (n=30)	6 (20.0)	10 (33.3)	10 (33.3)	4 (13.4)		
Monthly Income (INR)	<25,000 (n=78)	8 (10.3)	30 (38.5)	22 (28.2)	18 (23.0)	15.84	0.014*
	25,001–50,000 (n=138)	22 (15.9)	74 (53.6)	28 (20.3)	14 (10.2)		
	50,001–75,000 (n=116)	26 (22.4)	56 (48.3)	24 (20.7)	10 (8.6)		
	>75,000 (n=88)	32 (36.4)	38 (43.2)	16 (18.2)	2 (2.2)		
Area of Residence	Urban (n=298)	70 (23.5)	144 (48.3)	56 (18.8)	28 (9.4)	6.64	0.084
	Semi-Urban (n=122)	18 (14.8)	54 (44.3)	34 (27.9)	16 (13.0)		

Correlation analysis revealed significant positive relationships among knowledge, attitude, and practice scores. Knowledge demonstrated a moderate positive correlation with attitude (r=0.472) and a strong positive correlation with practice (r=0.558).

Attitude also showed a moderate positive correlation with practice (r=0.438). These findings indicate that higher knowledge levels are associated with more positive attitudes and better preventive practices, highlighting the critical role of awareness in influencing health-related behavior.

TABLE 9: Correlation Between Knowledge, Attitude, and Practice (KAP) Scores Among the General Population of Haryana (n = 420)

Variables	Knowledge Score	Attitude Score	Practice Score
Knowledge Score	1	0.472**	0.558**
Attitude Score	0.472**	1	0.438**
Practice Score	0.558**	0.438**	1

Pearson's Correlation Coefficient (r)
****Correlation is significant at the 0.01 level (2-tailed)**

DISCUSSION

The present study assessed knowledge, attitude, and practices (KAP) regarding hearing loss and its prevention among the general population of Haryana in the context of increasing exposure to environmental and recreational noise. The findings provide important insights into the current level of awareness, prevailing perceptions, and behavioral patterns related to hearing health, highlighting both strengths and critical gaps.

Knowledge Regarding Hearing Loss

The study revealed that overall knowledge regarding hearing loss and its prevention was moderate to good, with a majority of participants demonstrating good or excellent awareness levels. High awareness was observed regarding common causes of hearing loss, such as prolonged exposure to loud noise and unsafe earphone use, as well as its impact on communication and quality of life. This suggests that general information about hearing health is increasingly accessible, possibly due to growing digital exposure and public health messaging. However, notable gaps were identified in more specific and technical aspects, including safe listening practices (such as the 60/60 rule), understanding of ototoxic medications, and age-related hearing loss (presbycusis). These findings indicate that while participants may be familiar with general concepts, deeper and more practical knowledge required for effective prevention remains insufficient. Similar trends have been reported in previous KAP studies, where basic awareness exists but detailed understanding of preventive strategies is lacking.18-21

Attitude Toward Hearing Loss and Prevention

Attitude toward hearing loss was generally positive among participants, with most recognizing it as a significant health concern and acknowledging its impact on quality of life. A large proportion expressed agreement with the importance of preventive measures, early medical consultation, and hearing protection in noisy environments. Additionally, there was strong support for increasing public awareness and implementing government-led initiatives, reflecting a favorable mindset toward hearing health promotion. Despite this, certain misconceptions persisted. Some participants underestimated the susceptibility of younger individuals to hearing loss or did not fully appreciate the necessity of consistent preventive practices. These findings suggest that although attitudes are largely favorable, they may not always translate into a strong perceived personal risk, which is essential for behavioral change. This gap between awareness and perceived vulnerability is a common challenge in preventive health behavior.

Practices Related to Hearing Loss Prevention

In contrast to knowledge and attitude, practices related to hearing loss prevention were relatively suboptimal. A significant proportion of participants reported regular use of earphones, often at high volume levels, and frequent exposure to loud environments. Adoption of protective behaviors—such as limiting listening duration, following safe listening rules, and using hearing protection devices—was comparatively low. Furthermore, although many participants acknowledged the importance of early medical consultation, only a smaller proportion had undergone hearing check-ups, and a considerable number reported ignoring early symptoms of hearing loss. Risky practices such as frequent use of cotton buds were also prevalent. These findings highlight a clear disconnect between knowledge/attitude and actual behavior, emphasizing that awareness alone is insufficient to ensure adoption of preventive practices.

KAP Relationship and Behavioral Gap

One of the key findings of this study is the significant positive correlation between knowledge, attitude, and practices. Higher knowledge levels were associated with more positive attitudes and better preventive practices, reinforcing the critical role of awareness in influencing health behavior. The strongest correlation observed between knowledge and practice suggests that improving knowledge may directly contribute to better adoption of safe hearing practices. However, despite these correlations, the persistence of unsafe practices indicates the presence of a "knowledge–practice gap." Individuals may be aware of risks but fail to adopt preventive behaviors due to factors such as convenience, lifestyle habits, lack of perceived immediate harm, or social influences. This highlights the need for interventions that not only provide information but also promote behavioral change through motivation, reinforcement, and accessibility of preventive measures.

Influence of Socio-Demographic Factors

The study demonstrated that education, occupation, income, and age were significantly associated with knowledge, attitude, and practices. Participants with higher educational levels and income demonstrated better awareness, more positive attitudes, and more appropriate practices. Professionals also showed more favorable KAP profiles compared to other occupational groups. These findings underscore the role of socioeconomic factors in shaping health literacy and behavior. Individuals with higher education and income are more likely to access reliable information, understand health risks, and adopt preventive measures. Conversely, lower socioeconomic groups may face barriers such as limited awareness, reduced access to healthcare services, and competing priorities, which can hinder preventive practices.

Gender and area of residence did not show statistically significant associations, although urban participants demonstrated relatively better trends. This may reflect increasing digital penetration and access to information across different population groups, potentially reducing traditional disparities. Overall, the study demonstrates that while awareness and attitudes toward hearing loss are relatively favorable among the general population of Haryana, significant gaps persist in preventive practices. The findings highlight the need for targeted, behavior-focused interventions to bridge the gap between knowledge and action and to promote effective hearing loss prevention strategies at the community level.22-24

Public Health Implications

The findings of this study have important public health implications. The moderate-to-good levels of knowledge and positive attitudes provide a strong foundation for implementing preventive strategies. However, the gap in actual practices highlights the need for targeted interventions focusing on behavior change rather than awareness alone. Health education programs should emphasize practical aspects of hearing loss prevention, such as safe listening habits, limiting exposure to loud noise, and the importance of regular hearing check-ups.

Digital platforms, social media campaigns, and community-based awareness programs can be utilized to disseminate accurate and actionable information. Additionally, incorporating hearing health education into school and workplace settings may help address risk factors among younger and working populations. Healthcare professionals also play a crucial role in promoting hearing health by providing counseling, encouraging early screening, and reinforcing preventive behaviors. Policy-level interventions, including regulations on noise exposure and promotion of safe listening standards, are equally important in reducing the burden of preventable hearing loss.

Strengths and Limitations

A key strength of this study is its comprehensive assessment of knowledge, attitude, and practices within a single framework, allowing for a holistic understanding of hearing health awareness and behavior. The relatively large sample size enhances the reliability of the findings. However, certain limitations must be acknowledged. The use of an online questionnaire may have led to overrepresentation of younger, educated, and digitally literate individuals, potentially limiting generalizability to rural or less literate populations. Self-reported data may be subject to recall and response bias. Additionally, the use of convenience sampling limits the ability to establish population-level estimates.

CONCLUSION

The present study demonstrates that the general population of Haryana possesses moderate-to-good knowledge and generally positive attitudes regarding hearing loss and its prevention. However, significant gaps persist in the adoption of safe hearing practices, particularly related to prolonged earphone use, high-volume listening, and limited utilization of preventive measures such as hearing protection and regular check-ups.

Socio-demographic factors, especially education, occupation, and income, significantly influenced knowledge, attitude, and practices. Furthermore, the positive correlation between knowledge, attitude, and practices highlights the critical role of awareness in shaping preventive behavior. These findings emphasize that while awareness is improving, translating knowledge into consistent and safe practices remains a key challenge in hearing loss prevention.

RECOMMENDATIONS

To address the identified gaps and promote hearing health at the community level, the following recommendations are proposed:

- Strengthening Public Awareness Campaigns: Develop targeted educational programs focusing on safe listening practices, early symptoms of hearing loss, and preventive strategies using digital media, community outreach, and mass communication platforms.
- Promoting Safe Listening Behavior: Encourage adoption of practical measures such as limiting earphone use, maintaining safe volume levels (e.g., 60/60 rule), and reducing exposure to loud environments through behavior change communication strategies.

- Integration into School and Workplace Programs: Incorporate hearing health education into school curricula and occupational health programs, especially in high-risk environments, to promote early awareness and preventive habits.
- Enhancing Access to Screening Services: Facilitate periodic hearing screening camps and promote routine hearing check-ups, particularly for high-risk groups, to enable early detection and timely intervention.
- Role of Healthcare Professionals: Strengthen patient counseling by healthcare providers regarding hearing loss risks, safe listening practices, and the importance of early consultation.
- Policy and Regulatory Measures: Implement and enforce regulations to control environmental and occupational noise levels, and promote safe listening standards for personal audio devices.
- Use of Digital Health Platforms: Utilize mobile applications, online resources, and telehealth platforms to disseminate accurate information and improve accessibility to hearing health services.

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