

## Music Players and Young Adults- A Survey

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### **Abstract:**

**Aim:** The aim of this study is to survey and document the patterns of usage and listening habits of personal music players among young adults in India.

**Method:** A total 500 (169 M, 331 F) young adults between the age range of 17- 24 years participated in the study. The questionnaire was developed in English and was designed to collect information. The questionnaire was divided into two sections. The first section of questions consisted of demographical data such as name, age, gender and college information. The second section consisted of 17 (closed and open-set) questions about PMPs, its use and effects.

**Results:** All the 500 young adults surveyed reported that they used PMPs. The cell phone was the most frequently used PMP (68%) followed by the others devices such as iPod (28%), laptop/computer with ear phone (24%), MP3 player (21%), and walkman or portable CD player (10%).

**Conclusion:** Promoting responsible listening habits could prevent premature damage to the auditory system. The manufacturers of PMPs should provide necessary technical information and modifications to the users. This will enable the users to be aware of the maximum output levels of various devices available in the market.

**Keywords:** Music Players, Young Adults, Hearing Loss.

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### I. Introduction

It is widely accepted that constant exposure to loud noise will cause damage to hearing [8, 20]. Hearing loss consequent to noise exposure is called Noise Induced Hearing Loss (NIHL). The damage occurs gradually and causes permanent metabolic changes in the cochlea [4]. Exposure to occupational noise (such as, industrial noise, traffic noise, gunfire, etc) has been identified as a cause of hearing loss by several researchers [1, 2 & 6]. More recently, recreational noise (also known as leisure noise) has been identified as a cause of damage to hearing [5].

Recreational noise is generally produced by sources such as Personal Music Players (PMPs), discos, etc [13, 14]. PMPs are portable devices that are used to play audio files, such as MP3 files, using earphones or speakers. In addition, many of these devices can store videos and pictures, podcast radio and TV programs. With rapid development of digital technology and reduction in cost, the use of PMPs have become popular among young adults. MP3 players and iPods are common among the few systems used by this group [18].

As in the West, in India too there has been remarkable increase in the number by young adults using PMPs. There has been very little documentation of the pattern of use/listening habits in Indian population. Kumar et al [9] reported the output levels of personal music players and preferred listening levels in quiet and in the presence of background noise among college students. The results of the study differ from the studies reported in the West [4, 15 & 18]; especially with reference to the volume setting and duration of use PMPs.

Due to the scarcity of evidence on the usage of PMPs among the young adults in India, it is pertinent to study the nature, patterns and usage of PMPs in adolescents and young adults in the Indian context. A survey of the listening habits of young adults will provide information that could be used to plan awareness and education program on responsible PMP use. The aim of this study is to survey and document the patterns of usage and listening habits of personal music players among young adults in India.

### II. Method

**The study was carried out in two phases:**

Phase I was the development of Questionnaire.

Phase II was the administration of the Questionnaire and analysis of results.

#### **Phase I: Development of the Questionnaire:**

The questionnaire used in the survey was composed of different questions relating to PMPs, its usage and its effect on hearing. Prior to designing the questionnaire other questionnaires developed on similar topics

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were reviewed. These included; Developing a Questionnaire to Assess Noise Exposure in Children and Teens [10], Survey of Teens and Adults about the Use of Personal Electronic Devices and Head Phones [21], Output sound pressure levels of personal music systems and their effect on hearing [9], Auditory lifestyles and beliefs related to hearing loss among college students in the USA [12].

**The questionnaire was developed in English and was designed to collect information on the following topics:**

1. Type of PMPs used
2. Ear phone styles used
3. Type of music genres listened to
4. Different environments/situations in which PMP was used
5. Number of listening sessions
6. Duration of use of PMP per day
7. Typical volume setting of PMPs
8. Concerns about hearing
9. Awareness about impact on hearing
10. Symptoms of hearing loss

The questionnaire was divided into two sections. The first section of questions consisted of demographical data such as name, age, gender and college information. The second section consisted of 17 (closed and open-set) questions about PMPs, its use and effects. The questionnaire was distributed to 5 qualified audiologists to review the questions, and then the questionnaire was revised based on the suggestions given by the audiologists.

#### ***Phase II: Administration of the questionnaire:***

##### ***Participants:***

A total 500 (169 M, 331 F) young adults between the age range of 17- 24 years participated in the study. All the participants were university students.

##### ***Procedure:***

Participants were seated in a group in a class room and the questionnaires were personally distributed by the investigator. Instructions were given to complete the questionnaires. As formal informed consent was not required; participants were verbally informed that confidentiality of the information collected would be maintained.

*b*

Participants were instructed to complete questions in the questionnaire based on their patterns of usage of PMPs. The participants were asked to tick more than one answer, where appropriate. Instructions were given to complete the questionnaire independently and the participants were given 10 minutes to complete the questionnaire.

*b*

The data was collated using Microsoft excel program for further statistical analysis. Descriptive statistics was used to determine the frequency and percentage of the participants by using software SPSS 14.0 version.

### **III. Results**

#### ***Types of PMPs used:***

All the 500 young adults surveyed reported that they used PMPs. The cell phone was the most frequently used PMP (68%) followed by the others devices such as iPod (28%), laptop/computer with ear phone (24%), MP3 player (21%), and walkman or portable CD player (10%). A small proportion of participants (7%) reported use of portable television/DVD player with ear phones. The results suggested that 56% of participants listened to all genres of music. This included classical, film, pop, and rock, instrumental. There was approximately equal distribution of those who listened to rock (18%) and classical music (19%), 15% listened primarily to pop and 12% preferred instrumental music. The participants mostly (58%) preferred listening to music while travelling, while 46% during leisure activities, 10% listened to music during exercise and while studying and 18% of the participants has no specific time for music. When asked about the duration of PMP use in a day, 53% of the participants reported the use of PMPs for less than 1 hour in a day followed by 27% listened to music between 1- 2hours per day. Less than 20% of the participants listen to music for longer durations (>2hrs) a day. More than three quarters of the participants (76%) listened to music in 1 or 2 sessions in a day. When asked how long they listened to music in a stretch, majority (71%) of the participants reported that the longest session of listening to music ranged between 30 minutes to 2 hours. Many (55%) also reported that the duration of shortest session was <30 minutes. The participants were asked to report their preferred loudness

levels. The number of participants using PMPs at maximum volumes was only 21%. More than half (55%) used the PMPs at medium volume even in noisy environments while 16% varied the volume controls quiet frequently. The participants were asked to report the situations/environments in which volume levels of PMPs was increased. Of the 500 participant in the study, 70% agreed to increase the volume quiet often. Out of them 36% of participants increased the volumes when a particular song or music they liked was played, 16% increased the volume settings, when they were at home, in noisy backgrounds, or while travelling, and during leisure activity. Twelve percent of participants also increased the volume, when the song was not heard well or if the volume was very low. A small proportion (6%) of participants increased the volume of the PMPs when they were happy or alone.

Decreasing the volume settings was also reported by 51% of participants. Twenty four percent of participants decreased the volume related to different environments. These included conditions such as (a) while studying, (b) while at home, (c) while sleeping, (d) if someone was talking, and (e) while giving attention to other work. About 11% of participants reduced the volume when they did not like the song that was being heard, 9% of participants reduced the volume when they felt that the output was loud and 4% of participants reduced when they were sad or alone. A small percentage (3%) of participants decreased the volume when their ear started to pain.

A majority (65%) reported that they used headphones with their PMPS, 41% also reported to use insert ear phones and button type ear phones. In the present study more than half of the participants (65%) had similar symptoms as reported in the ASHA survey [21] (Table 1). History of otological findings (headache in 19%, feeling of irritation in severe, blockage of ear in three percent and heaviness in three percent) was reported by many, however a majority (69%) did not report of any significant otological symptoms.

**Table 1: Symptoms of hearing loss reported by participants**

	Frequency	Percentage (%)
Increase the volume of your television/radio to hear it comfortably	327	65
Ask for repetition during conversation	100	20
Think other people’s speech is unclear	55	11
Experience tinnitus or ringing in the ears	18	4
None	74	15

The majority (69%) of participants were concerned about the hearing. Eighty eight percent were aware that exposure to loud music through PMPs could cause hearing loss. Sixteen percent of participants in study also reported that parents had expressed their concerns that PMPs use could cause damage to hearing. Other than parents, the participants had not been warned about risk of hearing loss from other sources (table 2).

**Table 2: Sources that provided warning on risk of hearing loss due to PMP use**

	Frequency	Percentage (%)
Parents	80	16
Friends	35	7
Audiologist	23	5
Relatives	22	4
Family members	12	2
Articles and news papers	5	1
ENT doctor	5	1
Teachers	5	1
Family doctor	5	1
TV channels	4	1

#### IV. Discussion

Every one of the 500 young adults surveyed reported that they used PMPs. The cell phone was the most frequently used PMP followed by the other devices. The ASHA survey [21] also reported that a large proportion adults and high school students used cell phones more often when compared to other electronic devices to listen to music. Gender related findings suggested that more girls than boys use Apple iPods, laptops, and cell phones. Similar patterns of usage were observed in the present study.

The results suggested that 56% of participants listened to all types of music. In the west, Worthington et al [19] reported that “rock” was the most popular genre of music with young adults followed by “pop” music. It is possible that cultural influences and the population used in the study could have determined the types of music preferred by young adults. The nature/type of music is important, as it relates to loudness levels at which they are generally listened to. Listening to music while travelling and during leisure was mostly reported. Similar results was reported by Kumar et al [9] who also documented that students listened to music more while travelling. Vittitow et al [17] study reported that the proportion of students who listened to music while

exercising was quiet small, a finding supported in the study. In order to understand the listening habits and patterns of use of PMPs, the questionnaire obtained information regarding total duration of use of PMPs per day, the number of listening sessions in a day; more than half of the participants used the PMP less than one hour a day. Studies from the west by, Torre [16] reported listening duration of 1-3 hours and ASHA survey [21] also reported listening durations of 1-4 hours in a day. Probably the usage of PMPs is more prevalent in the west. It has been suggested that listening times should be limited to 1 hour or less [4]. Some PMPs even have a built in cut off to limit use to one hour [3]. More than three quarters of the participants (76%) listened to music in 1 or 2 sessions in a day (Fig.2). Torre's [16] report suggests that 50% of the students listen to more than 3 sessions in a day.

Majority (71%) of the participants in the study reported that the longest session of listening to music ranged between 30 minutes to 2 hours. Many (55%) also reported that the duration of shortest session was <30 minutes. This is in contrast to the ASHA survey [21], Torre [16] and Hodgetts et al [7] studies that have reported that longest duration of sessions up to 4 hours.

In addition to knowing about duration of use, it is important to know the loudness level at which the PMPs are used, so as to estimate the risk of hearing loss due to PMP use. Several reports in western literature have suggested that maximum output of PMPs be limited to 100 dB [7, 11]. Studies from the West [4, 11] have reported that students use the PMPs at maximum volume. In contrary, Kumar et al [9] reported that students in India used the PMPs at medium volume. Similar to the results of this study.

The questionnaire also obtained information about participants changing (increasing or decreasing) the volume settings and the circumstances in which the changes were made. It has been reported that in specific situations such as the presence of background noise there is a tendency to increase the volume settings [18]. Participants of the study (70%) report to increased the volume. Vogel et al [18] had suggested that when a favorite song was playing, if the volume was low, or in order to hear well, students reported an increase in volume settings. The results of this study followed a similar pattern.

Vogel et al [18] owing to which the volume control was reduced. The type of earphone used may determine the output level of the sound reaching the tympanic membrane. Headphones are reported to have the lowest maximum output level (100 dB SPL) among other styles [5, 11]. Conversely, it should be noted that the preferred listening levels are higher with insert ear phone style of headphones when compared to the over-the-ear style [7, 9]. The type of PMP being used would determine the type of ear phone being used. It is important to educate young adults on the outputs of different types of earphones/receivers while developing programs on responsible PMP use. Symptoms of hearing loss are often reported much before there is awareness about the hearing loss. The ASHA survey [21] reported that three out of four symptoms of hearing loss were reported in their sample. Twenty six 26% of the participants needed to increase the volume of television to hear comfortably, 21% of adults found themselves asking for repetition by saying "what" or "huh" when having a conversation with someone in normal voice tones and 12% of adults had tinnitus or ringing in the ears. In the present study more than half of the participants (65%) had similar symptoms. The otological findings (headache, irritation, blocking, and heaviness) and other associated problems reported by participants of the present study was very low.

The majority (69%) of participants were concerned about the hearing. Interestingly, similar results have also been obtained by Toumi&Jelliman [15]. This is in contrast to the western reports where only 29% participants were aware that listening to music through personal music players could damage hearing [15].

In order to create an effective program on responsible PMPs use, it is necessary to understand the sources through which the young adults are likely to get information and be influenced. In the ASHA survey [21], parents reported that they had taken several steps to address their concern about hearing loss caused by PMPs use. Parents also suggested that TV, internet, friends, etc may be useful in influencing children to change listening habits. Sixteen percent of participants in study also reported that parents had expressed their concerns that PMPs use could cause damage to hearing. Other than parents, the participants had not been warned about risk of hearing loss from other sources. The media (TV/ Internet/Radio) have probably not been used for public education and creation of awareness in India.

The results of this study clearly indicate that the usage of PMPs are very popular among the young adults. The findings are in consonance with findings reported in another study carried out in India [9] with reference to listening habits and patterns of usage of PMP. In the populations studied, the duration of usage of PMPs by most participants was limited to less than 2hrs and used in medium volume settings. Nevertheless, there could be others who could be using their PMPs for longer durations and at more dangerous listening levels. In this relatively young population (aged 17-24 years), almost 60 percent reported at least one symptom of hearing loss without any significant report of associated otological problem. It would be worthwhile to explore the relationship between PMP use, symptoms of hearing loss and audiological findings.

The results of this study and the study by Kumar et al [9] differ from other surveys reported in western literature [7, 15 & 21]. This may suggest that the cultural milieu could influence the patterns of use and listening

habits of young adults who use PMP. This must be taken into account while designing programs for promoting responsible PMP use.

## V. Conclusion

Damage to hearing occurs when a person is exposed to loud sounds over time. The risk of hearing loss increases as sound is heard loud and for longer durations [11]. There is a widespread concern about the risk of hearing loss from listening to loud music for long duration using Personal Music Players (PMP). Although there are several studies documented in the Western literature regarding the use of PMPs, there have been very few attempts to study this in the Indian context. Therefore the current study attempted to document, listening habits and patterns of usage of PMPs of young adults (age range 17 – 24 years) in India. In the present study a survey of 500 university students was carried out to determine the patterns of usage of PMPs in young adults. The data obtained in the survey was subjected to suitable statistical analysis.

The pervasive use of PMPs was an interesting finding. One hundred percent of the participants reported that they used PMPs. The usage of cell phone (67%) for listening to music was the most popular, as compared to other devices. Seventy percent of the participants reported that they used more than one device to listen to music. Fifty eight percent of participants reported that they listened to music while travelling and leisure activities. Furthermore, the majority of the young adults listened to music for 30 minutes- 2 hours in 1 to 2 sessions at medium volume. There were a small proportion of young adults who listened to music for long duration and at high volumes. Headphones were most commonly used when compared to other earphone styles. The findings of the present study documented that 65% of the participants had at least one symptom (increase the volume of your television/radio to hear it comfortably) of hearing loss.

The results of the study are similar to that reported by Kumar et al [9] and different from data obtained from Western countries. In the present study the use of PMPs were for short duration (< 2hrs) and settings at medium volume as compared to the western countries, where the PMPs are used for longer duration and at high volume settings.

The study highlights the need for creating awareness among the young adults who may be at risk for hearing loss due to use of PMPs. It also suggests that, promoting responsible listening habits could prevent premature damage to the auditory system. Not much information about PMPs use and risk of hearing loss is available in the public domain. It is important to use social networking sites, internet, media, and peer group interactions to promote responsible PMPs use. The manufacturers of PMPs should provide necessary technical information and modifications to the users. This will enable the users to be aware of the maximum output levels of various devices available in the market.

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**Appendix: - Questionnaire**  
**Name :- (Optional) Date:-**  
**Age: - Sex:-**  
**College: -**

**Note: -** Tick (✓) against appropriate answer. Mark more than one if required.

**1. Do you listen to music through Personal Music Players (PMPs)?**

- (a) Yes (b) No

If you have answered yes to the above questions, please complete the following questions (2-17). If you have answered no, please return the questionnaire unanswered (2-17).

**2. What type of PMPs do you use?**

- (a) Cell phone  
 (b) Walkman or portable CD player  
 (c) Laptop/ Computer with ear phone  
 (d) Portable television/DVD player with ear phone  
 (e) MP3 player  
 (f) iPod

**3. What type of music do you prefer to listen?**

Pop	Rock	Classical	Instrumental	All	Others (list)
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**4. What are the situations/environments in which you listen to music?**

Travelling	Studying	Leisure	Exercise	All	Others (list)
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**5. In one day how long do you use personal music players?**

<input type="checkbox"/> <30 minutes	<input type="checkbox"/> 30 minutes-1 hour	<input type="checkbox"/> 1 -2 hours	<input type="checkbox"/> 2-3 Hours	<input type="checkbox"/> >3 hours
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**6. How many sessions would you listen to music each day?**

<input type="checkbox"/> 1 session	<input type="checkbox"/> 2 sessions	<input type="checkbox"/> 3 sessions	<input type="checkbox"/> 4 sessions	<input type="checkbox"/> More than 4 sessions
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**7. What is the shortest duration for a single session?**

<input type="checkbox"/> < 30 minutes	<input type="checkbox"/> 30 minutes-1 hour	<input type="checkbox"/> 1-2 hours	<input type="checkbox"/> 2-3 hours	<input type="checkbox"/> More than 3 hours
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**8. What is the longest duration for a single session?**

<input type="checkbox"/> < 30 minutes	<input type="checkbox"/> 30 minutes-1 hour	<input type="checkbox"/> 1-2 hours	<input type="checkbox"/> 2-3 hours	<input type="checkbox"/> More than 3 hours
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**9. At what volume level do you use personal music player normally?**

<input type="checkbox"/> Maximum volume	<input type="checkbox"/> Medium volume	<input type="checkbox"/> Minimum volume	<input type="checkbox"/> Variable
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**10. Do you change the volume?**

Yes	No
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**11. Do you?**

Increase the volume If yes, when?.....	Decrease the volume If yes, when?.....
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**12. What is the type of ear phone you use?**

Inserts	Headphones	Button type	Any other
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**13. Are you aware that listening to music for long duration can affect hearing?**

- (a) Yes (b) No

**14. Are you concerned about your hearing?**

- (a) Yes (b) No  
(c) If yes, how much?.....

**15. Do you?**

- (a) Increase the volume of your television or radio to hear comfortably.  
(b) Ask for repetition during conversation.  
(c) Think other people speech is unclear.  
(d) Experience tinnitus or ringing in the ears.  
(e) None

**16. Do you have any history of otological/associated problems?**

- (a) Blocking (b) Heaviness (c) Irritation (d) Headache (e) None  
(f) Others

**17. Has anyone warned you regarding the loss of hearing?**

- (a) Yes (b) No  
(c) If Yes, Who?.....