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Earphone usage and its implication on health among college going students in Puducherry: A cross sectional study

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Abstract
Introduction: Popularity of using earphones/headphones is being increased dramatically over a period of time. Sound exposure for longer duration will affect the ear and will not recover soon.
Objectives: To study the sociodemographic profile and the pattern of usage of earphones during day, night, while driving and sleep & to determine the impact on hearing.
Materials and Methods: A cross – sectional study was conducted in a private engineering college, from February to April 2019.Data was collected from 200 students using a pre-designed closed end questionnaire.
Result: Most of the students especially day scholars (66%) are using earphones when compared with the hosteler (34%). Female usage of earphone (62%) is more when compared with the male(38%). 17% have prior ear associated disease and still continuing the usage, and 12% reported accident on usage of earphones.
Conclusion: In order to safeguard the future generation proper health education and attention must be sought there to.

Keywords: Earphones, hearing loss, loud, earphone usage, students

1. Introduction

Technology is moving ahead day by day, leaving us all confined in splendor and comfort with a lot of unknown harmful side effects on health. Popularity of using earphones / headphones have been increased dramatically over a period of time. However, not everyone knows that excessive use of this device may cause irreversible damage to the ear, in the short or long term. The physical characteristics such as frequency and intensity and other non-occupational noise at high sound levels, determines the impact on hearing health, and results in a public health problem, which affects most of the world population [1].

Sound exposure for longer duration will affect the ear and will not recover soon. Headphones usage results in damage to the ears the same way other loud noises do, resulting in noise induced hearing loss. However, the headphones don't have to be extremely loud to damage your ears, even listening to headphones at moderate volume can damage your hearing capacity over the period of time. That's because your ears are not just damaged due to the loudness of noise but by the length of exposure as well [2].

If one can hear the sound which is being delivered to a person's ear who is using headphones/earphones, it indicates that the sound is too loud and over a period of time it would lead to permanent hearing loss [3]. A noise of 90db, 8hrs a day for 5 days per week is a maximum safe limit as recommended by Ministry of Labour, Government of India under the factory act [4]. A noise level of 86db is equivalent to city traffic and the damage is seen after 6.5 hrs. of usage, whereas 101db is equivalent to hand drill and the damage is seen after 12min of usage.

According to WHO, about 1.1 billion young people worldwide are at risk of hearing loss due to exposure caused by unsafe use of personal audio devices [5]. Almost half of all adolescents and young adults (12- 36 yrs.) are exposed to unsafe levels of sound from the use of personal audio devices. And about 40% of them are exposed to potentially harmful noise levels in clubs, discos and bars.

The most common problems caused by the misuse of headphones are tinnitus, dizziness, difficulty in understanding speech, and decreased ability to hear. Difficulty and hearing loss occur in subtle ways so that people do not detect them in time to treat their problems, and when they finally notice, the lesions are irreversible. This leads to certain sensory difficulties that can directly affect the health and quality of life of people [1].

As observed by the researchers, listening to music, videos and playing games via earphones has become a common practice among the youth though it is seemingly switching over to adults and even some elderly people [6] This study was to examine the sociodemographic profile and the pattern of usage of earphones during daytime, nighttime, during driving & sleep and to determine the knowledge about its effect on hearing among the college students. The second objective was to estimate the prevalence of addiction and its impact on students lifestyle.

2. Aim and Methodology

The aim is to assess the earphone usage and its effect on college going students in and around Puducherry.After obtaining the Institutional Ethical Committee approval, the cross – sectional study was conducted in a private engineering college located around 10 km from the study setting, during the period of February to April 2019.The sample consisted of 200 students based on convenient sampling of both sexes between the age group of 17-29 years. The study included those who were willing to participate, and those who use earphones/headphones on a rare or daily basis and excluded students who were on hearing aids, diagnosed with any hearing problems and those who were absent consequently on all the three days of the visit.

The letter to permit, for conducting the study was submitted to the college. In the first session we interacted with the students to gain the rapport and explained the purpose and the need of the study. Data was collected from 200 students using a pre-designed semi structured, closed ended questionnaire. The compilation was made using MS Excel 2016 Professional Plus and analyzed using SPSS Software version 21.

3. Discussion and Results

The survey was conducted among 200 college going students of both sexes with majority of them being male 75% and the remaining being female 25%. Similarly, the study conducted by Sara Herera and others comprised of male 54.96% and female 45.04% [1]. In our study most of the students were within the age group of 17- 20 years (70%) and meagre of them were more than 23 years (2.5%). Of all the participants, First-year students were 54%, followed by second year 21.5% and the third year 2.5%.

The predominant group in the present study were the day scholars comprising of 66% and most of them were belonging to a nuclear family.In the recent era, most of the students are left solitary without any proper care/attention from their parents. And to overcome the loneliness they get themselves occupied to electronic gadgets like earphones which make it noticeable that day scholars use earphones more on being compared with the hostelers.

"All work and no play makes Jack a dull boy", this proverb suggests the untiring work of almost all the parents to upgrade their economic status and similarly in this study majority were working parents. 65% of them had one parent working, as most of the women in India were housewives, and around 35% had two parents working. On detailed analysis majority of the parents were farmers and predominantly had one parent working, hence the per capita income was the only means to assess the social-economic status and since the study setting being a rural area the Modified BG Prasad classification was used.

The (table 1) shows the frequency, percentage of the social-economic status of the samples, in which 30.5% belongs to middle class, 26% of them belongs to upper class and 2% of them comes under lower class. The male gender uses earphones more frequently when compared to female gender in our study and the result is significant with the P Value <0.05. In the contrary, a study by Hodgetts, Rieger &Szarko 2007, states that girls use earphone more frequently than boys [7].

According to our study 55 of the students uses earphones while driving, of which 12 of them met with accidents due to earphone usage while driving. Significantly, most of them (145) do not use headphones while driving and the difference between these two group were found to be significant with the P Value being <0.05. Similarly, a study by Dhruvendra Pandey and others had minor part of the participants (37.3%) stating the use of headphones during driving [8].

In our study, nearly 18% of the participants uses earphones which is in accordance with the study conducted by Stephen E, Sara & Kim [9]. where 21% reported using earphones while sleeping. Out of 200 students, 12.5% of them had/have ear disease. Among them 8.5% use headphones in spite of them being diagnosed with ear disease. According to a study, done by Asghar Mohammed & others, 32% of them reported ear disease associated with earphones [10]. In the present study majority of them used earphones for less than 1 hr (60%) which is similar to the study conducted by Sara herera and others [1]. 62% of the students uses earphones in high volume which is also in accordance with the study conducted by Sara herera and others [1].

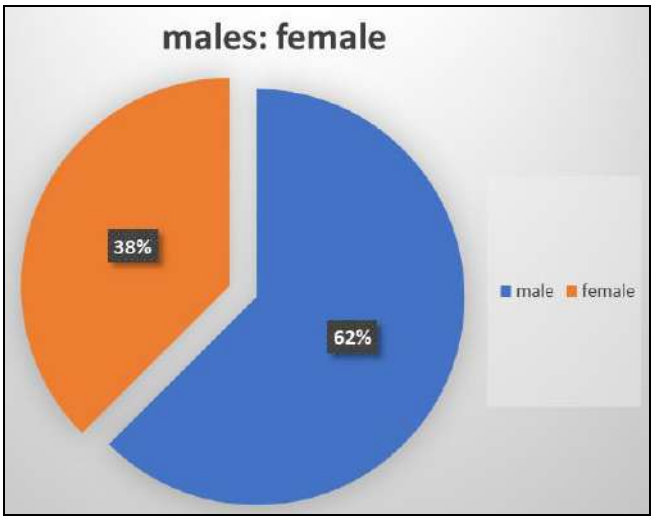

Fig 1: Distribution of Gender In Earphone Usage

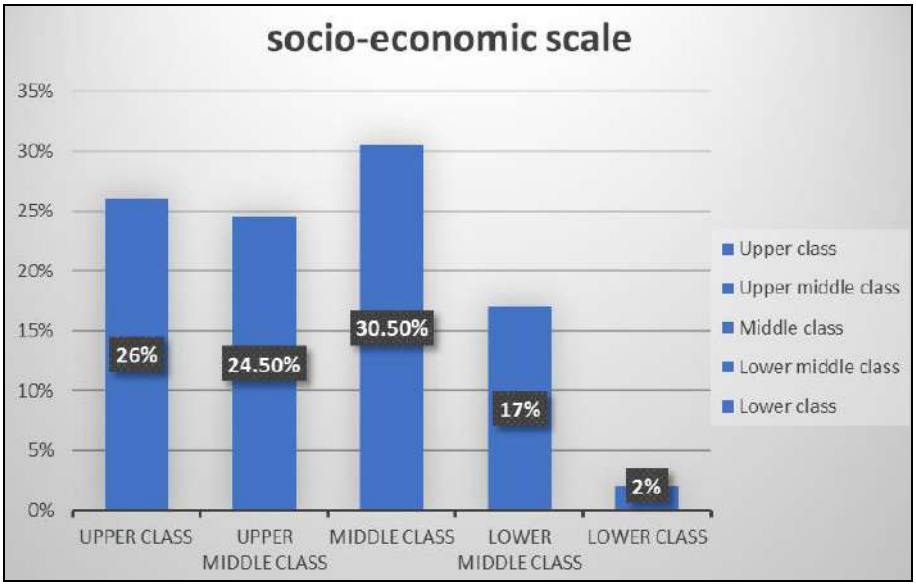

Fig 2: Distribution of Social-Economic Scale of Students.

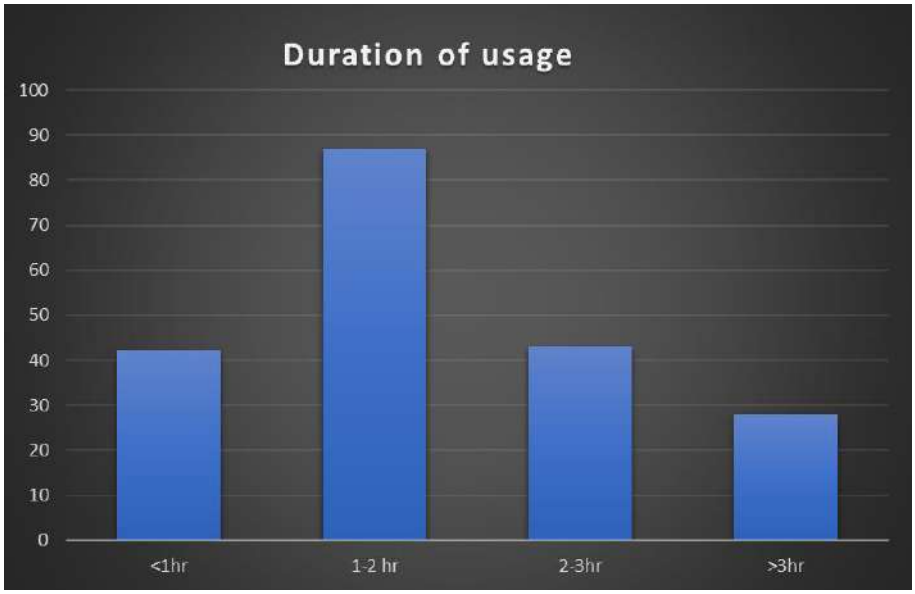

Fig 3: Distribution of Duration of Usage of Earphones.

Table 1: Demofgraphic Profile of Study Population

	Category	Frequency	Percentage
Year of Study	1st	108	54%
	2nd	72	36%
	3rd	20	10%
Age	17-20 years	140	70%
	20-23 years	55	27.5%
	>23 years	5	2.5%
Gender	Male	125	75%
	Female	75	25%
Resident	Hostelers	68	34%
	Day-scholars	132	66%
Socio Economic Scale	Upper class	52	26%
	Upper middle class	49	24.5%
	Middle class	61	30.5%
	Lower middle class	34	17%
	Lower class	4	2%
Type Of Family	Nuclear	154	77%
	Joint	46	33%
Parent Working Status	One parent	130	65%
	Both parent	70	35%
Frequency of Use	<1hr	120	60%

Per Day			
	>1hr	34	17%
	None	46	23%
Volume Used	Low	6	3%
	Medium	70	35%
	High	124	62%

Table 2: Association between Gender and Earphone Usage

Variable	Male	Female	P value
Earphone (+)	85	60	<0.005
(-)	40	15	
Driving (+)	41	14	<0.005
(-)	84	61	
Sleeping (+)	20	16	>0.005
(-)	105	59	

Table 3: Association between Other Outcomes and Earphone Usage

Variable	Ear Disease (+)	Ear Disease (-)	P value
Earphone (+)	17	128	>0.005
(-)	8	47	
	Accident (+)	Accident (-)	
Driving (+)	12	43	>0.005
(-)	24	121	
	Driving (+)	Driving (-)	
Hostelers	16	52	>0.005
Day scholars	39	93	

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