

HOW DO THE STAFFS WORKING IN STEEL FACTORIES IN ARDEKAN CITY DEAL WITH THE RISKS OF MOBILE PHONES?

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ABSTRACT

Nowadays, mobile phone is one of the most important tools required for social and professional life; however, in some circumstances it can threaten the health of individuals. This study was aimed to determine the behaviors of the staffs working in steel factories in Ardekan city toward the risks of mobile phone radiation and microbial contaminations. This cross-sectional study, which was conducted in 2014, was aimed to evaluate the staff behaviors toward the risks caused by mobile phone radiation and microbial contamination. The study population was consisted of the staffs working in Steel Plant of Ardekan city. The participants of the study were selected via using cluster sampling method. A researcher made questionnaire was used to collect the data; it had 15 items which were used to assess the behavior. The validity (face and content validity) and reliability of the questionnaire were first confirmed and then it was used for data collection. Data analysis was performed using SPSS 22 statistical software. In this study, a total of 319 employees working in steel factories were evaluated. The mean age of the subjects was 33.04 ± 8.05 years, the mean work experience of the staff was 8.3 ± 6.05 years, the mean household size was 2.4 ± 1.33 persons, and the mean mobile phone bill at the last two months was 50.25 ± 43.47 . The mean score of the staff behavior varied from 0.9 to 2.4. The studied staff had a poor performance in terms of health promoting behaviors. Apparently, to promote staff health it is necessary to utilize educational interventions aimed at increasing staff awareness, changing their attitudes and behavior, and finally changing their lifestyle..5%). Most cases whose reports were unsatisfactory were documented in the first phase of the study (i.e., 9 patients, 90%).

Conclusion: Cervical screening with Pap smear enables early diagnosis and management of cervical abnormalities and consequently a decrease in the rate of invasive cervical cancers. It is suggested to conduct studies with larger sample sizes to ensure the beneficial effects of cervical screening.

Key words: Knowledge, Attitude, Behavior, Mobile phone, staff.

Received February 05, 2016; Accepted March 02, 2016

Introduction

In recent years, the number of people who use mobile phones has increased rapidly⁽¹⁾ and in this age of technology the use of mobile phones is inevitable^(2,3). According to the International Agency for Research on Cancer, mobile phone radiation can cause cancer⁽¹⁾. Hence, although mobile phone is one of the most important tools required for social and professional life, in some circumstances it can

threaten the health of individuals^(4,5). No technology in human history has ever experienced the rapid growth of mobile phone and has not become so universal. During a ten-year period (1998 to 2008) the use of mobile phone has increased three times faster than other communication systems such as landline and the Internet⁽⁶⁾. Mobile phone, as an extract of the existing technologies in the world, has many features and functionalities. As a result a mobile phone can provide people with the benefits

of e-government services, mobile services, mobile news, mobile entertainment, mobile teachers, mobile banking, mobile TV, mobile office, mobile mail, etc.⁽⁷⁻⁹⁾.

The mobile phone is usually placed in a pocket or bag, but it has frequent and close contact with the face and hands⁽¹⁰⁾. Hence, it can be contaminated via contact with unclean human skin or hand, phone bags, pockets, and the other things around. It can act as a suitable habitat for microbial growth⁽¹¹⁻¹³⁾ and facilitate the transmission of infectious diseases through contact with hand⁽¹⁴⁾.

In a study in India, at least 75% of the mobile phones were contaminated with at least one pathogenic organism⁽¹⁵⁾. Based on laboratory findings, numerous studies have reported the presence of different types of microbial infection on the mobile phones⁽¹⁶⁻²⁰⁾. According to the World Health Organization, electromagnetic radiation emitted by mobile phones are a threat to people's life, because the radiation may cause changes in the electrical activity of the brain and result in insomnia, headaches, memory problems, damage to the reproductive system, etc.⁽²¹⁾. In addition, several studies have reported the possible adverse effects of mobile phone microwave radiation on human body which may lead to the development of different types of cancer and may cause adverse effects on the heart, liver, spleen, kidney, gonads, eyes, and other tissues. These health threats may specifically threaten the health of the pregnant woman and babies⁽²²⁻²⁵⁾.

Inappropriate health practices and behaviors may increase the spread of bacteria isolated from mobile phones^(26, 27). Regular use of disinfectant⁽²⁸⁾ and washing hands before and after eating are among the measures to prevent and reduce the potential for bacterial infections transmitted by the mobile phones⁽²⁹⁾. Moreover, to protect oneself against the effects of radiation it is necessary to reduce the duration of mobile phone calls, keep the phone away from vital organs, use covers for anti-radiation, avoid mobile phone use during pregnancy and childhood, and use antioxidants such as vitamins E, C, A in the daily intake⁽²⁴⁾. Given the importance of the above mentioned facts and since no study has been conducted yet in the country to evaluate the behaviors associated with mobile phone use, this study was conducted to determine the behaviors of the staffs working in steel factories in Ardekan city toward the risks of mobile phone radiation and microbial contaminations.

Material and methods

This cross-sectional study was conducted on 319 employees working in steel factories in Ardekan city in 2014. This descriptive study was aimed to evaluate the staff behaviors toward the risks caused by mobile phone radiation and microbial contamination. The study population included the staffs working in Steel Plant of the Ardekan city. Using cluster sampling method, the samples were recruited from the staffs on commuting buses. Having at least one year of experience in the industry was set as the inclusion criterion. The refusal to take part in the study was considered as the exclusion criterion. A researcher made questionnaire was used to collect the data; it had 10 items about demographic data and 15 items which were used to assess the behavior. The questions about the behavior had five choices including: always, often, sometimes, rarely, and never. The score for each question was between 0 and 4 and the total score ranged from 0 to 60. The questionnaire was used after confirming its validity (face and content validity) and reliability (internal consistency). To determine the content validity of the questionnaire we used CVI and CVR measures and to determine the internal consistency we used Cronbach's alpha test. The collected data were analyzed using SPSS 22 statistical software and we used both descriptive and inferential tests.

Results

In this study, a total of 319 employees working in steel factories were evaluated. The mean age of the subjects was 33.04 ± 8.05 years, the mean work experience of the staff was 8.3 ± 6.05 years, the mean household size was 2.4 ± 1.33 persons, and the mean mobile phone bill at the last two months was 50.25 ± 43.47 . As shown in Table 1, more than 80% of the subjects were married and most of them (42.6%) had high school diploma. With reference to job position, many of the subjects (30.7%) were operator.

Table 2 presents the questions used to assess the behavior of individuals. These questions had five choices and the choices included the followings: Always (4 pts), often (3 pts), sometimes (2 points), rarely (1 point), and never (0 point). It should be noted that questions number 10, 11, 12, 13, and 15 were reversed and their scores were assigned in a reverse form. The frequency and

mean total points of the responses to each one of the questions are presented in Table 2.

Variable	Frequency	Percentage	
Age (year)	20 -27	71	22.3
	28 - 33	125	39.2
	≤ 34	123	38.6
Marital status	Single	58	18.2
	Married	261	81.8
Household size	2-Jan	61	19.1
	4-Mar	197	61.8
	≤ 5	61	19.1
Education	Five grades or lower	32	1
	High school diploma	136	42.6
	Associate diploma	65	2.4
	Bachelor or higher	86	27
Work experience	5-Jan	127	39.8
	15-Jun	165	51.7
	≤ 16	27	8.5
Organizational position	Operator	98	3.7
	Technician	70	21.9
	Expert	68	21.3
	Servant*	83	26.6

Table 1: Frequency distribution of staffs working in steel factories by demographic variables.

According to the findings, the highest mean score was observed in response to the question “Do you keep your mobile phone away while sleeping?”, and that lowest score was observed in response to the question “Do you stuck your phone to your ear immediately after dialing and before the start of a call?”

Discussion

This cross-sectional study which was conducted on 319 employees working in steel factories in Ardekan city was aimed to determine the behavior of the staffs toward the risks of mobile phone radiation and microbial contamination. The study was carried out in 2014. As mentioned in the introduction, in some circumstances mobile phone can be a threat to human health. Some behaviors can reduce the likely threat. To prevent the transmission of microbial contaminations via mobile phones, the

following behaviors can be adopted: the regular use of disinfectant to clean the phone⁽²⁸⁾, washing hands before eating, and washing hands after using the mobile phone. Such behaviors prevent the growth of microbes on the mobile phone and inhibit the transfer of microbes to the human body^(29, 30).

domain of behavior	Always	Often	Sometimes	Rarely	Never	Mean
Do you clean your mobile phone every day?	67 (10.5)	196 (30.7)	194 (30.4)	137 (21.5)	44 (6.9)	1.1
Do you wash your hands after using a mobile phone?	3 (0.5)	142 (22.3)	219 (43.3)	175 (27.4)	99 (15.5)	1.0
If you use a mobile phone before eating, will you wash your hands to eat?	59 (9.2)	181 (28.4)	200 (31.3)	147 (23.0)	51 (8.0)	1.1
Do you use a wired or wireless hands-free while using your mobile phone?	0 (0)	11 (1.7)	191 (29.9)	255 (40.0)	181 (28.4)	1.1
Do you use phone speaker while using your mobile phone?	0 (0)	26 (4.1)	233 (36.5)	234 (36.7)	145 (22.7)	1.2
Do you use both ears, sometimes the right ear and sometimes the left ear, while using your mobile phone?	5 (0.8)	76 (11.9)	224 (35.1)	220 (34.5)	113 (17.7)	1.4
Do you stick your mobile phone to your ear immediately after dialing before starting the conversation?	272 (42.6)	193 (30.3)	116 (18.2)	57 (8.9)	0 (0)	9
Whether your phone is being charged when you use it?	46 (7.2)	152 (23.8)	191 (29.9)	178 (27.9)	71 (11.1)	2.1
Do you electrically charge your phone just when your phone battery is discharged and the device is turned off?	72 (11.3)	159 (24.9)	182 (28.5)	150 (23.5)	75 (11.8)	2.0
Do you use your mobile phone in places where cell phone network is poor?	32 (5.0)	192 (30.1)	265 (41.5)	131 (20.5)	18 (2.8)	1.9
Do you keep your mobile phone away when you sleep?	141 (22.1)	178 (27.9)	162 (25.4)	119 (18.7)	38 (6.0)	2.4
Do you allow the children to use your mobile phone?	48 (7.5)	158 (24.8)	188 (29.5)	151 (23.7)	93 (14.6)	2.1

Table 2: Absolute and relative frequency distribution of the studied staffs in terms of their response to the questions about each domain of behavior.

In this study, only 10.5% of the subjects cleaned their mobile phones every day; in other words, about 90% of the studied people did not clean their phones every day. In a study by Mark et al. (2014), 63% of people stated that they had never cleaned their mobile phone using alcohol and only 24% stated that they cleaned their phones on a daily basis; the rest of the subjects (13%) cleaned their

phone once a week⁽³¹⁾. With reference to the question “do you wash your hands after using a mobile phone?”, only 0.5% of the participants selected “always” option; the other people selected “often” (22.3%), “sometimes” (34.3%), “rarely” (27.4%), and “never” (15.5%). Washing hands after the use of a mobile phone has an important role in the reduction of the transmission of microbial contaminations^(30,32).

Another study evaluated the behavior of washing hands after using the mobile phone, and the results of the study showed that 45% of the studied people “never”, 38% “sometimes”, and 17% “always” washed their hands after mobile phone use⁽³¹⁾. The findings indicate that most people do not care about cleaning their mobile phones because perhaps they do not think their mobile phones are infected. However, several studies have reported that mobile phones are contaminated with different types of microbes^(16-20, 32-34), for example in a study by Sridhar et al. (2013) 70% of the mobile phones were examined and the results showed that the majority of them were affected by microbial contamination⁽³⁵⁾.

To reduce the negative effects of mobile phone radiation a number of behaviors can be adopted, among which we can note the followings: reduction of talk time, increasing the distance and keep the phone away from vital organs, using hands-free and loudspeaker during a call, and limiting mobile phone use during pregnancy and childhood^(24, 36-39). Generally, these behaviors are classified into two main groups: reducing the time of mobile phone use and increasing the distance between mobile phone and individual’s body.

According to the results of this study, the studied individuals had low scores in certain types of behavior, including the use of hands-free and loudspeaker during a call, use of both the right and left ear, and keeping the phone away after dialing until the start of the call. It means that the staff rarely practiced the mentioned behaviors, which might be attributed to the staff’s lack of awareness, and their poor attitudes toward such behaviors and habits. Nevertheless, the studied people had a better performance in terms of the following behaviors: not using mobile phone while charging, not using mobile phone when the battery charge is low, not using mobile phone in places where signal is weak, keeping mobile phone at a proper distance from the body while sleeping, not allowing the children to use mobile phone.

This group of behaviors might be practiced well because they are easier to be performed, or maybe the staffs have more knowledge and better attitudes toward these behaviors.

Conclusion

The possible damages of mobile phone are classified into two main categories: microbial contamination and the negative effects of radiation. It is necessary to adopt appropriate behaviors to prevent such harms. The studied subjects had a poor performance in relation to health promoting behaviors. Apparently, to promote staff health it is necessary to utilize educational interventions aimed at increasing staff awareness, changing their attitudes and behavior, and finally changing their lifestyle.

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