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MOBILE PHONE USAGE AND HYGIENE: AWARENESS AND PRACTICES AMONG ADOLESCENTS AND YOUNG ADULTS IN MALAYSIA

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ABSTRACT

The usage of mobile phones has increased dramatically, and phones become an essential accessory in our personal, social and professional life. Mobile phones can act as a reservoir of many pathogenic organisms. Mobile phones are ideal breeding sites for pathogens as they are kept warm and snug in our pockets and handbags. The important factor of contamination is the personal hygiene level. The aim of the study was to conduct a survey to identify the level of awareness about mobile phone microbial contamination and to assess the hygienic practice of its usage among the young adults. A self-administered questionnaire was designed and distributed among 100 mobile phone users. The data were then analysed descriptively. Chi square test was used to assess the associations between variables. Among the participants, 66% reported that they clean their phone less than once a week, and the majority was generally unaware of the infection risks associated with mobile phone usage. Respondents with tertiary education had higher levels of mobile hygiene practices compared to those with primary or secondary education ($p < 0.0005$). Students had higher levels of mobile phone hygiene compared to unemployed and employed respondents ($p = 0.009$). The respondents older than 25 years old had lower levels of mobile phone hygiene ($p = 0.002$). This study suggests that awareness about mobile phone microbial contamination is lacking. Therefore, multimodal awareness programs are needed to reduce the associated risks.

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1.0 Introduction

In recent decades, the usage of mobile phones has increased due to improvements in technological developments and competitive mobile phone prices. Unfortunately, communication technology has some negative effects on the people physically, psychologically, and socially. The mobile phones were used for audio calls previously but today become heavily equipped with other features that allow for communication and entertainment such as the popular Short Message Service (SMS), Multimedia Messaging Service (MMS), MP3 player, video games, video calls (Balakrishnan & Raj, 2012). Also used for navigation for driving and used for paying as e-wallets, etc. Inappropriate use of mobile phone by students in classrooms affecting students' academic performances (Rabiu et.al, 2016), Despite some knowledge on unfavorable health effects, mobile phones are gaining popularity, especially in young generation (Gupta et.al, 2016). In the meantime, the debate about its negative effect on human's health also being brought parallel. Mobile phone has effect on emergence of cancer cell, infertility, mental illnesses.

Decreased nocturnal concentration of hormone melatonin in adults is associated with exposure to mobile phone on average 34 minutes per day (Mercola, 2016). There are a lot of researched articles have been revealed the impacts of the mobile phones. However, little is known about proper hygienic practice for microbial contamination of mobile phones. Our study aimed to assess the awareness and hygienic practice of hand phones in community in Malaysia. The formatter will need to create these components, incorporating the applicable criteria that follow.

2.0 Methodology

The researchers conducted a cross sectional study by distributing questionnaires in several locations around Seremban (Negeri Sembilan, Malaysia), Klang (Selangor, Malaysia), Melaka town (Melaka, Malaysia) and Wangsa Maju (Kuala Lumpur, Malaysia). Consequently, we were able to get responses from 100 respondents from various backgrounds, age, race and social status. A set of questions were prepared based on the articles and literature review (Anuradha et. al., 2016; Balakrishnan & Raj, 2012). Questionnaires were divided into three section which are Section A: Socio-demographic questions, Section B: Awareness about mobile phone microbial contamination and Section C: Mobile phone hygiene practices.

The total score for mobile phone hygienic practices was calculated. Those with the score above five were considered as having high level of mobile phone practices. The data were analyzed descriptively by using frequencies and percentages. A chi-square test was conducted to investigate the association between sociodemographic variables and the level of mobile phone hygiene practices. Results were considered significant at $p < 0.05$. Statistical analyses were performed using SPSS 22.0.

3.0 Results and Discussion

Based on this survey, it was evident that the highest mobile phone users are from the age group of 21-35 years. Other studies also more focus on the young adults and majority of the study participants belonged to the young age group (Bodena et al., 2019; Anuradha et al., 2016, Bradey et al., 2012). The modern technology has increased the younger generation to use mobile phone and its applications for social networking and gaming purposes. Especially, young adults are habituated to social websites, online shopping and gaming etc for continuous usage of their phones. Now a day, general use of mobile phones is increasing across all age groups. In our study, the respondents were included between 10 years and 35 years of age. From the database, there are 54% of male respondents and 46% are female were participated in this survey. Most of them were Indian and Malay ethnicity. The participants were mostly from the low family income group (Table 1).

Among the participants, 33% were not aware that their phones are dirty while 27% were not sure about that. Awareness of mobile phone microbial contamination is relatively low, and they do not think that mobile phones can carry the pathogenic bacteria, viruses, fungi and viruses (Table 2). Most of the mobile users had their phone cover protectors (78%) though the phone is serviced the cover is not well sanitized and cleaned. The phone covers are also a factor for multiplication and spread of microorganisms. More than half of respondents (54%) never use the headsets. Well-equipped smart phones keep the user engaged with the phones for over a period and increases the chances of contamination too. From our study, 18% of participants used their mobile phones more than seven hours a day is one of the risky behaviors for phone addiction. On top of that, the longer duration of using a hand phone increases the temperature of the phone surface and it provides a favorable surface for the growth and multiplication and transmission of microorganisms.

Table 1: Socio-Demographic Characteristics of the Participants (n = 100).

Characteristics	Frequency	%
<i>Age groups:</i>		
10 – 19 years old	28	28.0
20 – 30 years old	33	33.0
21 – 35 years old	39	39.0
<i>Gender:</i>		
Male	54	54.0
Female	46	46.0
<i>Ethnicity:</i>		
Malay	35	35.0
Indian	42	42.0
Chinese	21	21.0
Others	2	2.0
<i>Highest educational level:</i>		
Primary	5	5.0
Secondary	59	59.0
Tertiary	36	36.0
<i>Occupation:</i>		
Unemployed	16	16.0
Employed	36	36.0
Student	44	44.0
Housewife	4	4.0
<i>Total household monthly income:</i>		
Below MYR3,000	46	46.0
MYR3,000-5,000	42	42.0
Above MYR5,000	12	12.0

Table 2: Awareness about Mobile Phone Microbial Contamination (n = 100).

Question	Answer (%)		
	Yes	No	Not sure
Do you think your phone is dirty?	40 (40.0)	33 (33.0)	27 (27.0)
Do you think your phone can carry harmful bacteria?	42 (42.0)	26 (26.0)	32 (32.0)
Do you think your phone can carry harmful viruses?	27 (27.0)	33 (33.0)	40 (40.0)
Do you think your phone can carry harmful fungi?	8 (8.0)	41 (41.0)	51 (51.0)
Do you think your phone can carry harmful parasites?	6 (6.0)	47 (47.0)	47 (47.0)

They even carry the hand phones in the washroom to use (24%) and 46% were using their phones during dining. Most of the respondents kept the phone in bed during sleep time (59%). Interestingly, only 9% wash their hands after using of phone while 91% did not wash their hand for hygienic practices. Among the respondents, 34% of them clean the hand phones although 66% were not clean once a week (Table 3). As shown in Table 4, respondents with tertiary education had higher levels of mobile hygiene practices compared to those with primary or secondary education ($p < 0.0005$). Students had higher levels of mobile phone hygiene compared to unemployed and employed respondents ($p = 0.009$). The respondents older than 25 years old had lower levels of mobile phone hygiene ($p = 0.002$).

Table 3: Mobile Phone Hygiene practices (n = 100).

Question	Answer (%)	
	Yes	No
Do you have a phone cover protector?	78 (78.0)	22 (22.0)
Do you use headsets with your mobile phone?	46 (46.0)	54 (54.0)
Do you use your phone more than seven hours a day?	18 (18.0)	82 (82.0)
Do you keep your phone in bed during sleep time?	59 (59.0)	41 (41.0)
Do you use your phone in the washroom?	24 (24.0)	76 (76.0)
Do you use your phone during dining?	46 (46.0)	54 (54.0)
Do you usually wash your hands after using your phone?	9 (9.0)	91 (91.0)
Do you usually use soap to wash your hands?	51 (51.0)	48 (48.0)
Do you clean your phone at least once a week?	34 (34.0)	66 (66.0)
Do you use wet tissue, alcohol wipe or disinfectant to clean your phone?	56 (56.0)	44 (44.0)

Table 4: Association between Socio-Demographic Variables and the level of Mobile Phone Hygiene Practices (n = 100).

Socio-demographic variables	Level of Mobile Phone Hygiene practices		
	Low	High	Chi ² (p value)
<i>Age group</i>			
10 – 19 years old	13 (46.4)	15 (53.6)	12.64 (0.002*)
20 – 30 years old	10 (30.3)	23 (69.7)	
21 – 35 years old	28 (71.8)	11 (28.2)	
<i>Gender</i>			
Male	32 (59.3)	22 (40.7)	3.20 (0.073)
Female	19 (41.3)	27 (58.7)	
<i>Ethnicity</i>			
Malay	14 (40.0)	21 (60.0)	4.93 (0.177)
Indian	10 (47.6)	11 (52.4)	
Chinese	25 (59.5)	17 (40.5)	
Others	2 (100.0)	-	
<i>Education</i>			
Primary or secondary	41 (64.1)	23 (35.9)	12.14 (<0.0005*)
Tertiary	10 (27.8)	26 (72.2)	
<i>Occupation</i>			
Unemployed	14 (70.0)	6 (30.0)	9.40 (0.009*)
Employed	22 (61.1)	14 (38.9)	
Student	15 (34.1)	29 (65.9)	
<i>Income</i>			
Below MYR3,000	23 (50.0)	23 (50.0)	0.06 (0.973)
MYR3,000-5,000	22 (52.4)	20 (47.6)	
Above MYR5,000	6 (50.0)	6 (50.0)	

Based on Figure. 1, 86 % of youth were using their hand phones at home and at School/ University 11% and 3% at work, respectively. Hand phones are usually keep depending upon users' accessibility. According to our results, most of the respondents carried their phones at pockets (62%) and handbag (32%) in Figure. 2. The hand phone users from our study mainly used for call and texting (74%) and the others used for social media (15%), surfing of the internet (6%), play games (3%) and taking pictures /videos (2%) in Fig. 3. The mobile phones are kept with other articles such as pens, spectacles, keys etc. Males usually keep it in shirt pockets or inside the pants whereas females keep inside handbags (Anuradha et al., 2016).

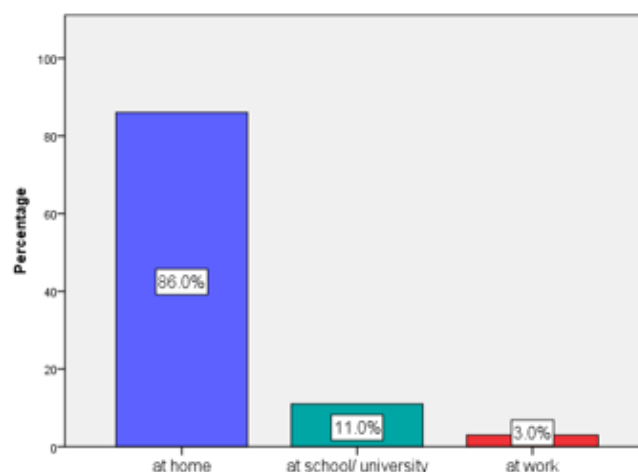


Figure 1: Place of mobile phone usage.

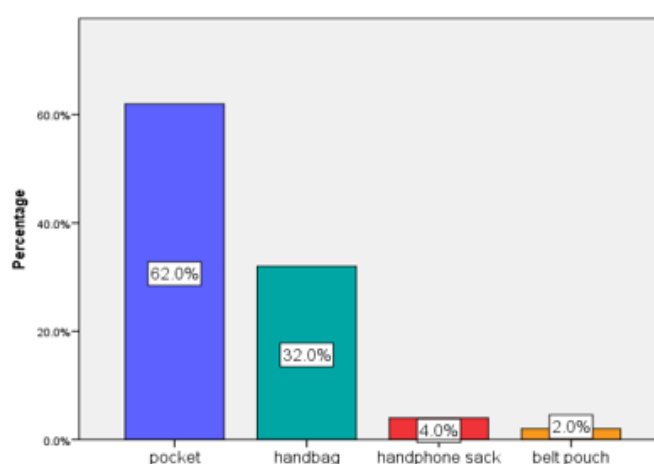


Figure 2: Areas used to keep mobile phones.

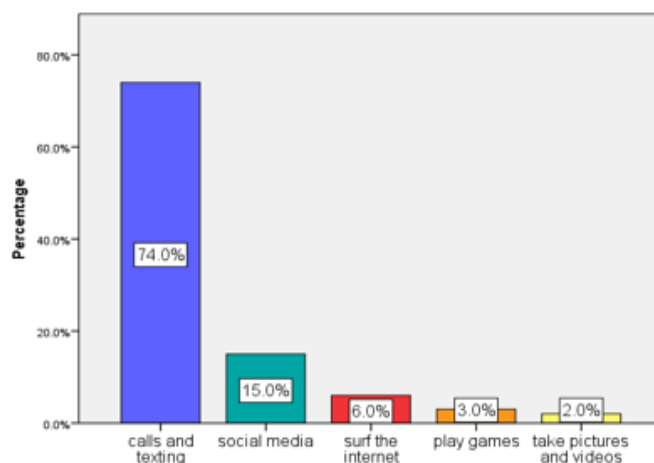


Figure 3: Purpose of mobile phone usage.

Washrooms are preoccupied with different types of pathogenic microorganisms. There are different microorganisms in the kitchen, dining table and toilets. If the mobile phone is used frequently in the washrooms, there may be a highly chance of contamination and by decreasing the usage at particular areas to reduce the microbial contamination. Therefore, it is advisable to avoid use of mobile phones in washrooms to keep good hygienic practices (Anuradha et al., 2016).

From this study, the use of mobile phones at washroom is 24%. Personal hygiene is very important to avoid microbial contamination in the washrooms. The bacteria and other microbes can be transmitted their ways to the community via human beings. In Figure. 4, majority of respondents used the mobile phones for their calls and texting (66.7%), while others were used for social media (29.2%), for pictures and videos (4.2%).

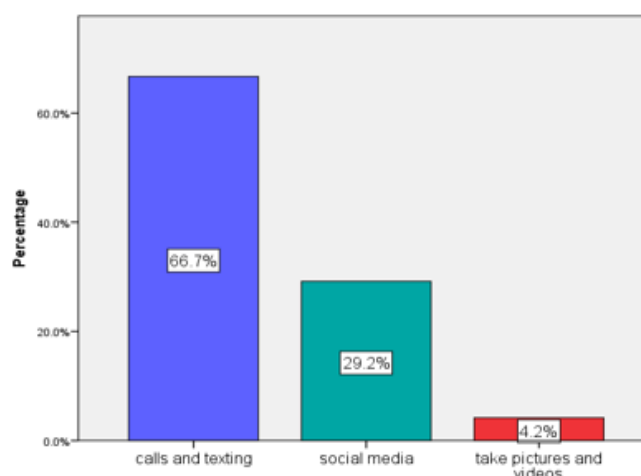


Figure 4: Purpose of mobile phone usage in washroom

Watching television during eating is popular enjoyment in the past decades, and the present is chatting with friends in social medias, taking pictures on food or watching movie, playing games etc. (Anuradha et al., 2016). In our study, usage of mobiles while dining, was found to be 46 %. Nearly half of the young people are using their mobiles while dining. Most of mobile phone users (60.9%) used for mobile phones for calls and texting during dining (Figure. 5) while others were using for other purposes like taking pictures/video (20%) playing social media (15%) and surfing the internet (4.3%). Dining table is more suitable place for multiplication of microorganisms, so use of mobile phones while dining increases the level of microbial contaminations.

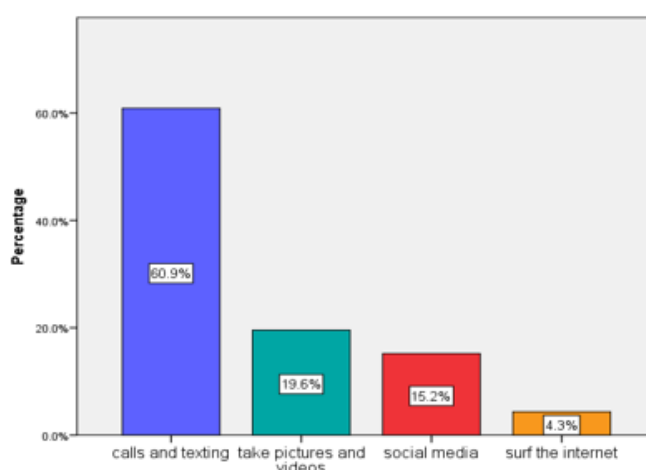


Figure 5: Purpose of mobile phone usage during dining

Cleaning is the process of removing unwanted substances, such as infectious agents, dirt, and other impurities, from an object or environment. Cleaning can reduce the microbial count on the surface of phone. Cleaning methodology differs from person to person depending on their knowledge and lifestyles. Anuradha et.al (2016) mentioned that there is no proper method developed for cleaning of mobile phone surface to avoid microbial contamination until now. Many people clean their phones by rubbing it on their clothes and some may use handkerchief or tissue paper to clean it rarely few use computer screen cleaning solutions to clean the mobile screens. From the study of Anuradha et.al (2016), most respondents clean their phones by using dry cloth, which is not a correct method to do and they recommended anti-microbial solution to clean the surface of the mobile phones. According to the study of Bradey et al. (2012), the simple cleaning can reduce the surface of the mobile phones and reduce the potential risk of cross-contamination

and their cleaning intervention is effective even inexpensive, easily instituted. Surprisingly from our study, 9% of young phone users are never clean their phone at all and 61% of respondents clean their hand phones once a month (Figure. 6). Based on the results, 91 % of participants do not wash their hands after using their phones. Most of the participants were unaware about the consequences the unhygienic phones which they are handling.

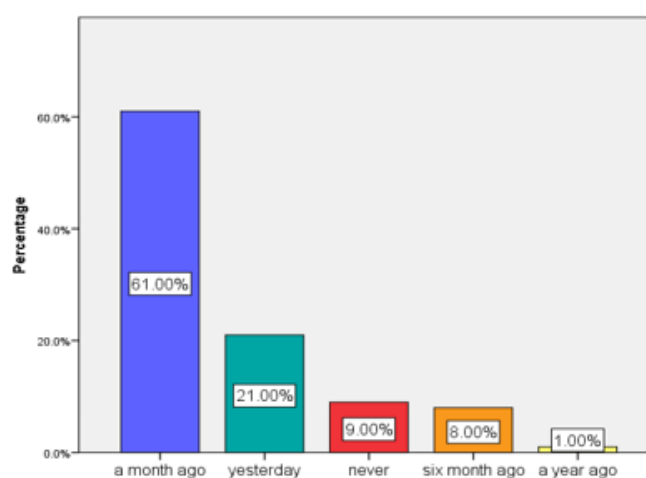


Figure 6: Last cleaning of mobile phone

4.0 Limitations

There are some limitations in our survey. Firstly, sampling from a wider population could have provided a clear idea regarding the topic of interest. Second is to increase the time frame and number of study phases were not possible due to logistical issues. Lastly, the impact of smartphone addiction on sleep pattern could have been studied in-depth. Nevertheless, we studied some extent of information on awareness of the microbial contamination, usage, hygienic practices in the adolescent and young adults in Malaysia.

5.0 Conclusion

This study suggests that awareness about mobile phone microbial contamination is lacking. Therefore, multimodal awareness programs are needed to reduce the associated risks. There are various steps that can be implemented in order to raise the awareness and to improve hygienic practices of using mobile phone among the adolescent and young adults. Some of these steps include education in the school, advertising in the social media and community-based awareness campaigns.

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