

# Awareness among medical students in Islamabad and Rawalpindi regarding use of anti-bacterial soaps: A cross-sectional study

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## Author's Contribution

<sup>1</sup> Conception, synthesis, planning of research and manuscript writing

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## A B S T R A C T

**Objective:** The objective of this study was to determine the knowledge, practices and attitudes of undergraduate medical students about anti-bacterial soaps and hand sanitizers.

**Methodology:** This was a cross-sectional study conducted with the help of a self-designed, validated online and paperback questionnaire. The questions were based on knowledge, attitudes and practices of students regarding antibacterial soaps and hand sanitizers.

**Results:** A total of 474 students participated in the study. Majority of the students preferred medicated soaps (55.7%) and hand sanitizers (41.6%) for daily use and considered these products to be superior to regular non-medicated soaps and hand sanitizers. Television commercials (61.8%) were the most common source of information about these products. Medical students found it important to further increase the use of medicated soaps for better protection against disease causing microbes.

**Conclusion:** Majority of the study participants were conscious about hygiene and hand sanitization because of interaction with patients. Moreover, most of the students perceived medicated soaps and hand sanitizers to be effective for protection against disease causing microbes under the influence of media marketing campaigns.

**Keywords:** Medicated soaps, hand sanitizers, medical students, hygiene

## Introduction

In recent years there has been a substantial rise in the demand of unregulated over-the-counter (OTC) consumer products like soaps and hand sanitizers containing antimicrobial ingredients with intent to minimize bacterial contamination [1, 2]. According to the results of several studies, such products containing antimicrobial active ingredients have failed to provide significant difference on germ protection as compared to regular soap and water [3, 4]. This issue becomes more complicated when antibacterial products market employs aggressive marketing strategies to attract consumers as media

reports about emerging lethal infections make general population vulnerable to widespread advertising tactics.

The hazardous effects of antimicrobial ingredients used in medicated soaps and hand sanitizers have been investigated in a number of studies which have reported that widespread use of such products can disrupt composition of gut-associated microbiome and cause different diseases [5, 6]. Besides antimicrobial resistance, other potential adverse effects such hormonal disruptions, harmful effects on developing fetus, environmental bioaccumulation, ecotoxicity and carcinogenicity have also been associated with the use of such products [7, 8,

9, 10, 11, 12]. Recently, FDA has issued a warning against the use of different active ingredients in OTC health-care products without prior permission and has made it mandatory to establish scientific data regarding the safety and efficacy of such products keeping in view the large amounts of different metabolites being found in waste water which is ultimately contacted by humans [13, 14].

Considering the gravity of the situation, some attempts have been made to investigate molecular basis of all these effects but there exists limited data to educate the general population about collateral damage caused by these antibacterial products. If medical students and medical professionals have adequate knowledge about rational use of these products, it would become easier to convey this to the general population. With this background, aim of this study was to determine the knowledge, practices and attitudes of undergraduate medical students about anti-bacterial soaps and hand sanitizers and their harmful effects in different medical colleges of Islamabad.

## Methodology

This was a cross-sectional study and conducted at Shifa College of Medicine, Islamabad after obtaining the Institutional Review Board approval. The sample size for this study was 500 students. The sample technique used for the study was random sampling. The questionnaire was self-designed, validated and distributed both online and in paperback to many medical students across cities of Rawalpindi and Islamabad. A short consent form was attached with the provided questionnaire and students who accepted the consent statement voluntarily were included as participants of the study. The questionnaire had twenty questions and by applying Cronbach's alpha the internal consistency of the questionnaire was found to be 0.69. The questions were based on knowledge, attitudes and practices. The questions were designed using Single Answer Multiple Choice, Likert scale format, short answer text format and Multiple Answer/Multiple Choice format.

The online questionnaire was linked to an online Microsoft Excel Spreadsheet for the collection of data. The paperback questionnaires were distributed in hand to the students and collected immediately after they had

been completed. The data collection and entry process began on 20th January 2018 and ended on 20th March 2018. The data was entered in Microsoft Excel Spreadsheet.

The data obtained was analyzed on IBM's statistical package for the social sciences (SPSS) version 23 (IBM, Armonk, NY). Descriptive statistics were used to analyze and describe the data. Analysis of variance (ANOVA) was used to test the difference in the percentages of participants using medicated soaps and non-medicated soaps. A p-value of less than 0.05 was considered significant.

## Results

A total of 474 students participated in the study. The details for demographic variables are in Table 1.

**Table 1: Demographic variables.**

Variables	
<b>1. Age (years)</b>	<b>Mean ±SD: 20.9 ± 0.86</b>
<b>2. Gender</b>	<b>Number of respondents</b>
Male	199 (42%)
Female	275 (58%)
<b>3. Hostelites vs Day scholars</b>	<b>Number of respondents</b>
Hostelites	384 (81%)
Day Scholars	90 (19%)
<b>4. Students per academic year</b>	<b>Number of respondents</b>
1st year	110 (23.2%)
2nd year	79 (16.7%)
3rd year	110 (23.2%)
4th year	85 (17.9%)
5th year	90 (19.0%)

The participants were further asked in the questionnaire how often they washed their hands in their typical routine out of the 5 options provided and the results are in Table 2.

**Table 2: Frequency of hand-washing**

Frequency (times a day)	Number of respondents
≥ 1 to < 5	157 (33.1%)
≥ 5 to < 10	183 (38.6%)
≥ 10 to < 15	96 (20.3%)
≥ 15 to < 20	25 (5.8%)
≥ 20	13 (2.7%)

The participants of the study were also asked to report their preferences for a specific type of brand of soap for washing hands in routine. 265 (56%) participants reported preference for medicated soaps while 79 (16.7%) participants preferred non-medicated soaps and 129 (27.3%) participants did not have any preference. The difference between the two groups was compared using the Chi-Square test. A p-value of less than 0.05 was considered significant. The results are in Table 3.

**Table 3: Preferences for brand of hand soaps**

Name and Type of Brand	Number of respondents	p value
<b>Medicated Soaps</b>		< 0.01
Dettol	126 (26.6%)	
Safeguard	69 (14.6%)	
Lifebuoy	69 (14.6%)	
<b>Non-Medicated Soaps</b>		< 0.01
Lux	79 (16.7%)	

The participants were asked to report the number of times they sanitized their hands in a day as well as their preferences for any type of brand of hand-sanitizer. The results are shown in Table 4.

**Table 4: Frequency of hand-sanitizing**

Frequency	Number of respondents
1-3 times a day	189 (39.9%)
4-6 times a day	116 (24.5%)
7-9 times a day	41 (8.6%)
10-12 times a day	16 (3.0%)

The preferences regarding hand-sanitizer brands were as follows: 134 (28.3%) participants chose Dettol, 52 (11.0%) participants chose Dial, 46 (9.7%) participants chose Purell, 17 (3.6%) participants chose Bath and Body Works and 11 (2.3%) participants chose Lifebuoy. 116 (24.5%) participants did not have a specific preference for brand of hand-sanitizer.

268 (56.5%) participants were of the opinion that television commercials presenting facts and figures about medicated soaps with children as a target audience were beneficial. Similarly, 300 (63.2%) participants believed that medicated soaps should be promoted and 306 (64.6%) participants believed that medicated soaps are the only means of combating infection.

The study participants were also asked to report the sources of information that provided them with facts and figures of both soaps and hand-sanitizers. The results are shown in Table 5.

**Table 5: Sources of information**

Sources	Number of respondents
T.V. Commercials	293 (61.8%)
Social Media	68 (14.3%)
Word of Mouth	47 (9.9%)
Articles	35 (7.4%)
Billboards	15 (3.2%)
Newspapers	10 (2.1%)
Movies	4 (0.8%)
Radio	2 (0.4%)

## Discussion

Our study had both male and female participants from all academic years. According to our results, the majority of the participants were conscious about hygiene as about 92% of the participants washed their hands at least five times a day to a maximum of fifteen times a day. This behavior can be attributed to the awareness and realization about constant exposure to microbes in clinics and hand washing being a general idea of protection against such microbes [15]. Students had a clear preference (p value < 0.01) for medicated soaps for daily use over regular non-medicated soaps and this behavior could again be driven by the strong perception among

medical students that medicated soaps provide better protection against disease causing microorganisms [16]. Our results are similar to other findings which have also reported increased awareness about hygiene among medical students [17].

Our results also reported high frequency of hand-sanitizing and main reason behind this finding could be the general perception that washing hands only with regular soaps is not enough for protection against disease causing microorganisms. Another reason for this practice could be the non-availability of soap and water at all times and the fact that application of hand sanitizers is a quicker and portable method of protection against microbes [1].

Our results also report that television as a media was the most important source of information for the students regarding medicated soaps and hand sanitizers. The fact that aggressive marketing campaigns [18] employed on television highlighting medicated soaps as a better means of protections against disease causing microbes as compared to regular soaps along with the fact that students reported television as the most significant source of information about medicated soaps explains increased use of these products amongst medical students. Constant interaction with patients in clinical wards could also be a factor to make medical students vulnerable to believe such information [19]. These results are also consistent with other studies on this topic [17]. Majority of our study participants also expressed their opinion in favor of more media campaigns to promote use of medicated products while approximately two third of these students also suggested that animated movies targeted for children be used to promote use of medicated soaps and hand sanitizers. In this context, there exists a need to introduce guidelines to regulate current marketing practices [20] of medicated consumer products among children and general population similar to the recent steps which have been taken to limit the marketing of unhealthy food items, breast milk substitutes and tobacco in the best interest of public health [21].

## Conclusion

To conclude, there is a need to educate medical fraternity and especially medical students about the pros and cons of medicated products. Furthermore, large scale studies are required to further investigate the potential

beneficial effects of these products for increased protection against disease causing microbes. More scientific data is also needed to explore possible harmful effects of medicated consumer products in general population.

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