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Research Article

Prevalence of Self-Medication and Assessment of its Consequences on Health among Female University Students in Islamabad, Pakistan

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Abstract: Self-medication (SM) is the drug attainment and consumption without consulting a doctor/physician against a particular disease. This cross-sectional study assessed SM and its consequences among the female students of the International Islamic University Islamabad (IIUI), Pakistan. A total of 180 female students from different academic departments were selected on the basis of stratified random sampling technique and the collection of data on SM was done with a pre designed questionnaire. Findings displayed that the prevalence of SM among the female students of IIUI, Islamabad, Pakistan was 32.22 to 55.6%. The information source of medicines in students was 48.9 % from doctors/physicians and 33.9% from the internet. The disease conditions for which SM was adapted include headache, flue, cough and cold in about 64.4% students and abdominal pain in 38.3% students. The most common medicines used for SM were pain killers for 49.4% students, vitamin supplements for 30.6% students and antibiotics for 16.7% students. About 46.1% students obtain medicines for SM from the medical stores and 33.3% obtain from hospitals pharmacy without doctors/physician's prescription. Majority were using medicines for seasonal (40%) or viral (21.7%) infections or during accidental cases (26.1%). Overall, 68.88% students confirmed that they experienced adverse effects on health after SM. 74.35% students felt some common side effects, 67.16% experienced drug/medicine resistance against other diseases and 58.06% experienced poor immune system due to SM. In this regard, medication through regular consultations with doctors/physicians is necessary and the execution of proper policies on advertising, marketing and selling of medicines with precautionary measures is recommended to avoid adverse effects on health.

Keywords: Self-medication (SM), Health Effect, Viral Infection, Antibiotics, Pain Killers.

1. INTRODUCTION

The desire of taking medicine for treatment with self-prescribed medicines remained a crucial aspect of life. Self-medication (SM) especially is very important in the maintenance of individual's health [1]. People have general perception that medicine should be taken during any disease or poor health conditions. Individuals who use self-prescribed medications are more concerned about their good health and disease treatment. People act differently to treat their symptoms of disease which is common among communities. SM practice is great drive in terms of self-care where the individuals undertake actions to improve their health and to prevent diseases after sickness or any physical or internal injury [1-8]. According to Alano *et al*. [9], SM is one of the elements of self-care, the way of taking medicines by individuals for the treatment of self-identified diseases or associated symptoms.

Hussain and Khanum [10] also explained SM as taking different types of medicines without the supervision of professional regarding the dosage, indication and course of treatment. Nevertheless, SM not essentially means the only use of modern medicines, yet it also includes the use of herbs and other natural remedies [11, 12]. During any disease

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condition, SM is the first option to adapt and hence is a common practice globally. The diseases are considered as minor, when they last for limited time and which are not life threatening. In some government bodies, SM reduces costs and assists health professionals to pay attention on some other very severe health conditions [9] and in the developing countries; various types of diseases are cured with SM practices. Some common health conditions for which individuals use self-prescribed medicines include flu, cold, headache, heart burn, constipation, minor skin problems and insect bites, etc., [13]. Though, SM is old practice and if it is employed appropriately, it limits the dependency on doctors. However, when abused, SM could cause delay in appropriate treatment and diagnosis of disease and may cause toxicity and drug interactions with serious side-effects [14, 15]. Some of the problems associated with SM include toxicity due to excess dose of medicine, inappropriate diagnoses, drug addiction, drug-drug interactions and various side effects in people. Other concerns associated with SM are increased pathogens resistance, health hazards and wastage of resources and money.

There are much SM anecdotal evidences available on inappropriate purchasing of medicines to treat particular disease condition, but very limited inquiries have quantified their consequences [13]. Pharmacists play a crucial role by assisting the individuals with pertinent information about medicines they use as SM. Advertising is another way to make individuals aware about the medicines used without prescription. It should always be friendly and encouraging for the individual to get advice from a pharmacist or physicians [16]. A lot of people are not aware about the drugs adverse effects which they use and also recommend to other individuals. Since this practice causes very serious problems to the individuals themselves and to those whom they suggest such medication. In this regard, the potential SM problems should be addressed to the individuals to reduce risks associated with SM. Antimicrobial resistance is a present global issue predominantly in some under develop countries where the use of antibiotics without doctor's prescription is common [14, 17]. As SM practice in educated student community is a substantial health problem [18], students are thought to be the role models in maintaining good health. Due to their vigorous part in cyberspace and media, students of the university could take more imperative part in this area [7, 19]. Also, the university students are thought to be very susceptible to SM because of their social interactions and their duties as future parents [19-22]. Despite SM being an issue of global concern, a very limited data on SM has been reported on those who belong to non-medical profession from Pakistan. Hence, the present study was conducted to uncover the information, approaches and practices towards SM among the female students of university. As there is very limited data available on this issue, this research helps in finding out the major factors that are responsible for SM and associated side effects among female university students from the Islamabad region of Pakistan.

2. MATERIALS AND METHODS

2.1. Study Design and Settings

This study was conducted to estimate the use of self-care medicine by female students at the International Islamic University, Islamabad Pakistan. The respondents were selected from different academic departments at the International Islamic University Islamabad, Pakistan female campus with the exclusion of teaching and nonteaching staff. The respondents were included based on their ability to read Urdu, being at least under the age of 18 and above and willingness to participate in the study. Those students who study pharmacy or medicine were not included in the study, since they are experts in SM with professional information about medication. Data from the selected respondents was collected through electronic questionnaire written in English. The questionnaire based on multiple parts was designed following previous studies [7]. The first part was based on the respondent's demographic information. The second part includes information on SM practice. The selected questions were about the information sources and various practices on SM. For some questions, the scaled measured contain two options by "Yes" and "No". Regarding SM, the variables assessed in this study includes: steps or measures taken by the respondent during sickness, distribution of the respondents regarding source of obtaining medicine, conditions or cases for self-prescribed medicines, types of self-prescribed medicines, disease symptoms regarding SM, information sources regarding SM and types of potential side effects experienced from SM.

2.2. Statistical Analysis

Computer analysis typically requires that people answer to questions or personal observation be converted into numbers. The obtained data was maintained in excel sheets and analyzed statistically with SPSS (SPSS, IBM Corporation, Version 26) and Chi-square test was performed to assess variables association [7].

2.3. Consent and Ethical Consideration

The survey for data collection was initiated with a brief explanation about the nature of the study to the respondents. The respondents were prior informed that their responses to the given questionnaire will be considered as consent to collect and process the data for research purpose.

3. RESULTS

3.1. Demographic Status of Respondents

Figure 1 (a-e) depicts the socio-economic status of the respondents including age, monthly family income, expenditure on drugs/medicines, nationality and living place of the respondents. The respondent's age is one of the significant variables in social research which is associated with person's behavior and attitude at different stages of life. Regarding the age, 117 (65.0%) respondents fell under 21 to 25 years and 50 (27.77%) respondents were under the age group of 18-20 years. The remaining 13 (7.2%) respondents were under the age group of 26-29 years (Figure 1a). The data further showed gross monthly family income of the respondents where maximum 63 (35.0%) respondents showed their family income up to 41,000 to 50,000 PKR, 49 (27.22%) respondents showed their family income above 50,000 PKR, 43 respondents showed income up to 31,000 to 40,000 PKR and 25 respondents revealed 20,000 to 30,000 PKR family income respectively (Figure 1b). Expenditure of the respondents on medicines/drugs showed maximum 82 (45.6%) respondent's expenditure was up to 1100 to 20,000 PKR, 42 (23.3%) respondent's medicines/drugs expenditure was in range between 500 to 1000 PKR, 36 (20%) respondent's medicines/drugs expenditure was 20,000 to 30,000 PKR and 20 (11.11%) respondent's medicines/drugs expenditure was 31,000 to 40,000 PKR (Figure 1c). The data further indicated 137 (76.1%) respondents were Pakistani nationals while 43 (23.9%) respondents were from other countries (Figure 1d). Regarding the living place of respondents, 92 (51.1%) were living in

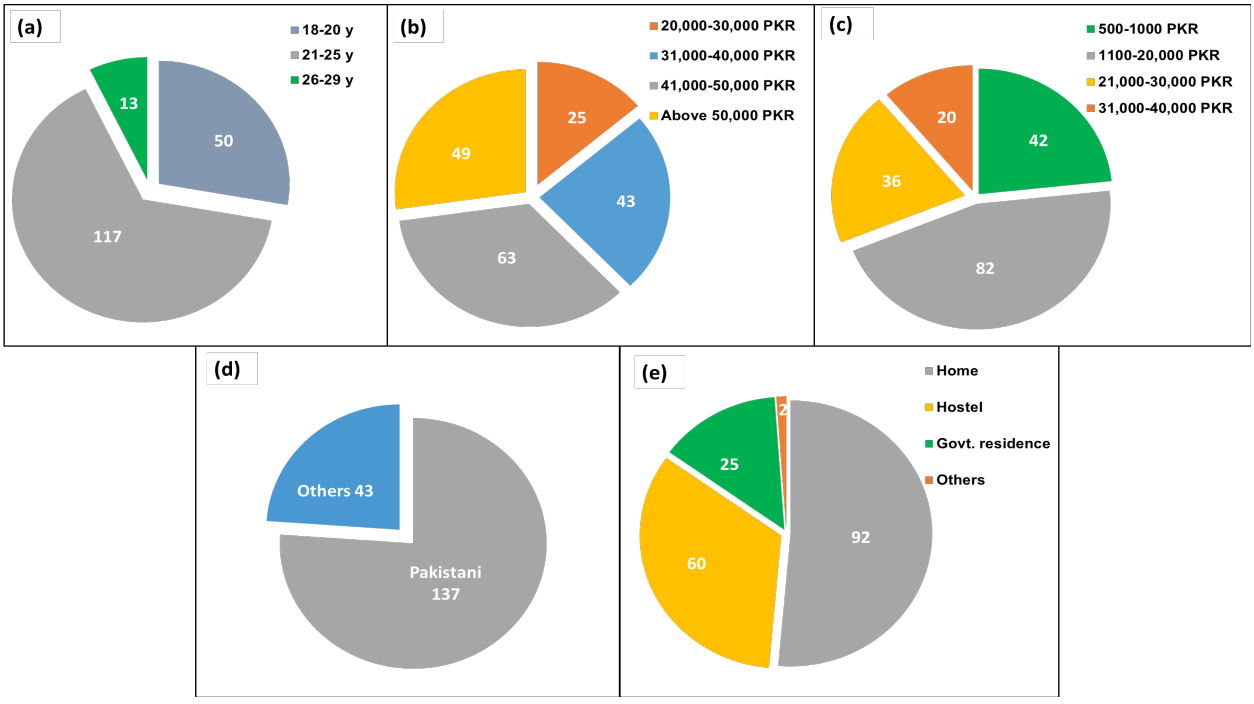

Fig. 1. Respondents' distribution on the basis of socio-economic status (n = 180), (a) distribution on the basis of age, (b) monthly family income, (c) expenditure of respondents on drugs/medicines, (d) nationality of the respondents, and (e) living place of respondents.

ancestral homes, 60 (33.3%) were living in hostels, 25 (13.9%) were living in government residence and 2 (1.1%) respondents marked others as their place of living (Figure 1e).

Figure 2 (a-c) provides information about respondents' socio-demographic status including marital status, family type and ethnicity. Out of 180 respondents, 99 (55.0%) were living as nuclear family, 51 (28.33%) as joint family, 16 (8.88%) as single parent and 14 (7.77%) as extended family (Figure 2a). Data further showed marital status of respondents, where 145 (80.55%) were single, while 25 (13.88%) were married (Figure 2b). The respondents were further asked to mention their ethnicity where 67 (37.2%) were Punjabi, 49 (27.2%) were Balochi, 36 (20.0%) were Pashtun and 28 (15.6%) were Sindhi (Figure 2c).

Figure 3 (a-d) shows details about the religion, area of residence, academic departments and condition of drug consumption of the respondents. Out of 180 respondents, 137 (76.1%) were Muslims (Islam), 32 (18%) were Christians (Christianity) and remaining were from other religions (Hindu and others) (Figure 3a), and about 63 (35.0%) respondents were from rural and 117 (65.0%) were from urban areas of the country (Figure 3b). Regarding the academic departments of the respondents, 38 (21.1%) respondents were from Psychology, 37 (21.6%) from Sociology, 36 (20.0%) from Education, 23 (13%) from Mass and Media Communication, 26 (14.4%) from Arts and Architecture and 20 (11.1%) were from the History department of the University (Figure 3c). Data on conditions of medicine/drug consumption showed that 99 (55.0%) respondents consumed medicines due to chronic diseases such as liver, kidney and cardiac problems, while 81 (45.0%) respondents consumed medicines due to some other health problems (Figure 3d).

3.2. Respondents' Knowledge About Self-Medication

Table 1 depicts the details of measures or steps taken by the respondent during disease condition. Almost 100 (55.6%) respondents sometimes prefer, 58 (32.2%) respondents always prefer, while 22 (12.2%) never preferred SM when they are sick. Almost 120 (66.7%) respondents sometimes consulted, 36 (20.0%) respondents always consulted and 24 (13.3%) respondents never consulted a doctor/physician when they are sick. 89 (49.4%) respondents sometimes ignore the sickness, 48 (26.7%) respondents always ignored and 43 (23.9%) respondents never ignored the feeling of sickness.

Table 2 shows the details of distribution of the respondents regarding the sources of obtaining medicines for self-care. 96 (53.3%) of

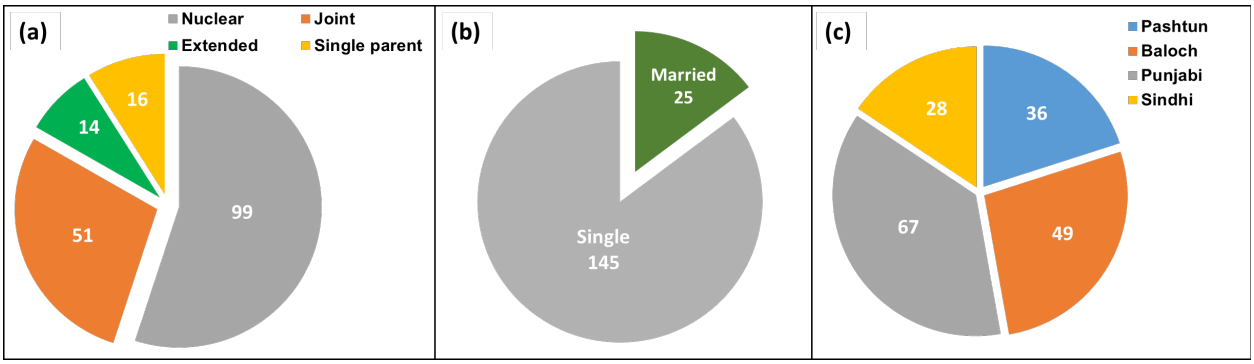

Fig. 2. Respondents' distribution on the basis of socio-demographic status (n = 180), (a) family type, (b) marital status, and (c) ethnicity of respondents.

Table 1. Distribution of the measures or steps taken by the respondents (n = 180) during sickness.

S/No.	Measures/Steps	Always	Sometime	Never/Not at all
1	Self–medication	58 (32.22%)	100 (55.6%)	22 (12.2%)
2	Consult a doctor/physician	36 (20.0%)	120 (66.7%)	24 (13.3%)
3	Ignore the feeling of sickness	48 (26.7%)	89 (49.4%)	43 (23.9%)

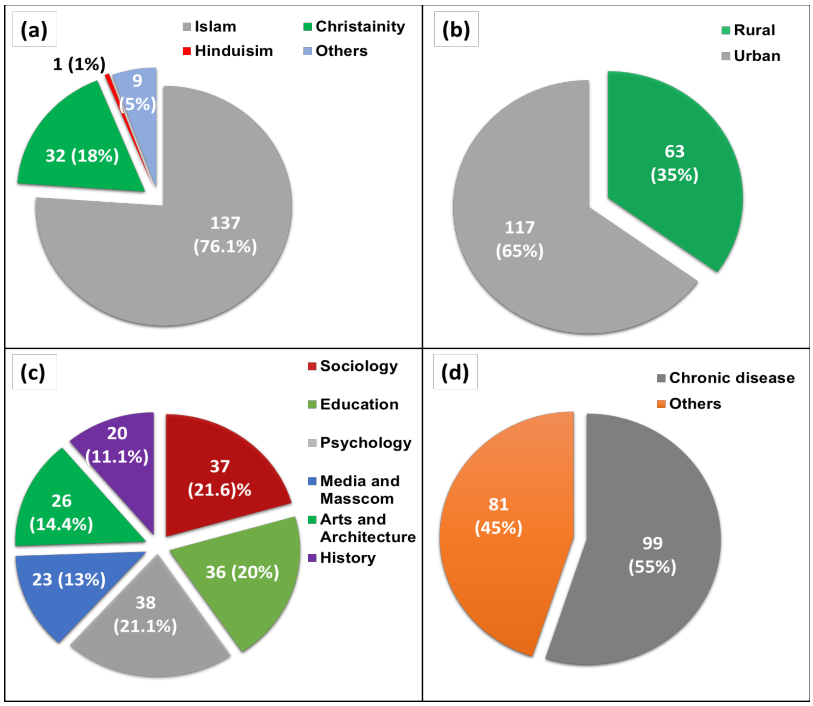

Fig. 3. Respondents' distribution (n = 180) on the basis of (a) religion, (b) area of residence, (c) academic departments, and (d) condition of the drug consumption.

the respondents obtained medicines sometimes from hospital pharmacy section while 60 (33.3%) respondents always obtained medicines from hospital pharmacy section. 76 (42.2%) sometimes obtained medicines from relatives while 24 (13.3%) always obtained medicine from friends or relatives. 83 (46.1%) respondents always obtained medicines from medical stores while 78 (43.3%) sometime obtained medicines from medical stores. 93 (51.7%) respondents obtained medicines sometime from friends or family. The 87 (48.3%) respondents sometime obtained medicines from previous hospital visit while 26 (14.4%) respondents always obtain medicines from previous hospital visits.

Table 3 shows details of conditions or cases due to which the respondents prefer SM. 72 (40.0%) respondents always preferred, 88 (48.9%) sometimes preferred and 20 (11.1%) never preferred SM in case of seasonal infections. 73 (40.6%)

Table 2. Distribution of the respondents (n = 180) regarding the source of obtaining medicine.

S/No.	Sources of medicine	Always	Sometime	Never/Not at all
1	Hospital pharmacy	60 (33.3%)	96 (53.3%)	24 (13.3%)
2	Relatives	24 (13.3%)	76 (42.2%)	80 (44.4%)
3	Medical stores	83 (46.1%)	78 (43.3%)	19 (10.6%)
4	Use left over from previous hospital visit	26 (14.4%)	87 (48.3%)	67 (36.7%)
5	Obtain drug/medicine from friends or family	25 (13.9%)	93 (51.7%)	62 (34.4%)

Table 3. Distribution of the respondents (n = 180) regarding condition or cases for self-medication.

S/No.	Conditions for SM	Always	Sometime	Never/Not at all
1	In case of seasonal infections	72 (40.0%)	88 (48.9%)	20 (11.1%)
2	In case of viral diseases	39 (21.7%)	73 (40.6%)	68 (37.8%)
3	In case of emergency or accidents	47 (26.1%)	54 (30.0%)	79 (43.9%)

sometimes preferred, 39 (21.7%) always preferred and 68 (37.8%) never preferred SM in case of viral diseases. 47 (26.1%) respondents always preferred SM in case of emergency or accidents while 54 (30.0%) preferred sometimes and 79 (43.9%) never preferred SM in case of emergency or accidents.

The details of types of medicines preferred by the respondents in SM are given in Table 4 where 89 (49.4%) respondents always used medicines, 66 (36.7%) sometimes use while 25 (13.9%) never used pain killers. 97 (53.9%) respondents sometimes use antibiotics, 30 (16.7%) always use and 53 (29.4%) never used antibiotics. 83 (46.1%) respondents sometimes use vitamins, 55 (30.6%) always use and 42 (23.3%) respondents never used vitamins as medicine for self-care. Some respondents used antacid (5% always, 23.3% sometimes, 71.7% never), anti-malarial (8.3% always, 25% sometimes, 71.7% never) and oral rehydration salts (13.3% always, 35% sometimes and 51.7% never) as type of medications in SM. The details of disease symptoms for which the respondents adapt medication are given in Table 5. Around 116 (64.4%) respondents pointed headache and 116 (64.4%) pointed cough and cold as disease symptoms due to which they prefer SM. 62 (34.4%) respondents pointed allergy as major cause, 69 (38.3%) respondents pointed abdominal pain or diarrhea and 58 (32.2%) claimed inability to sleep/ insomnia as symptoms due to which they prefer SM.

Table 6 provides data about the information sources of SM. About 88 (48.9%) respondents to great extent consulted, 72 (40.0%) respondents to some extent consulted and 20 (11.1%) never consulted the doctors/physicians to get information about SM. 19 (10.6%) respondents consulted nurses to great extent, 74 (41.1%) consulted to some extent and 87 (41.1%) never consulted nurses to get information on SM. About 61 (33.9%) respondents used internet as a source of information to a great extent, 75 (41.7%) to some extent and 44 (24.4%) never used internet as a source of information on SM. 52 (28.9%) respondents got information from relatives or friends to great extent, 82 (45.6%) to some extent and 46 (25.6%) never got information from relatives or friends on SM. 47 (26.1%) consulted pharmacists for information on SM to great extent, 72 (40.0%) to some extent and 61 (33.9%) never consulted a pharmacist for information on SM. Moreover, 35 (19.4%) respondents consulted ordinary newspapers and magazines to great extent, 55 (30.6%) to some extent and 90 (50%) never consulted ordinary newspapers and magazines for information on SM. 35 (19.4%) used leaflets to great extent, 65 (36.1%) to some extent and 80 (44.4%) never used leaflets for information on SM. Around 27 (15.0%) respondents used medical books to great extent, 73 (40.6%) to some extent and 80 (44.4%) never used medical books for information on SM.

Table 4. Distribution of the respondents (n = 180) regarding types of medication.

S/No.	Types of medication	Always	Sometime	Never/ not at all
1	Pain killers	89 (49.4%)	66 (36.7%)	25 (13.9%)
2	Antibiotics	30 (16.7%)	97 (53.9%)	53 (29.4%)
3	Anti-malarials	15 (8.3%)	45 (25.0%)	120 (71.70%)
4	Antacids	9 (5.0%)	42 (23.3%)	129 (71.7%)
5	Oral rehydration salts	24 (13.3%)	63 (35.0%)	93 (51.7%)
6	Vitamins	55 (30.6%)	83 (46.1%)	42 (23.3 %)

Table 5. Distribution of the respondents (n = 180) based on disease symptoms responsible for self-medication.

S/No.	Disease symptoms	Agree	Undecided	Disagree
1	Headache	116 (64.4%)	38 (21.1%)	26 (14.4%)
2	Flu, cough and cold	116 (64.4%)	39 (21.7%)	24 (13.3%)
3	Inability to sleep/Insomnia	58 (32.2%)	50 (27.8%)	72 (40.0%)
4	Allergy	62 (34.4%)	52 (28.9%)	66 (36.7%)
5	Abdominal pain or diarrhea	69 (38.3%)	39 (21.7%)	72 (40.0%)

Table 6. Distribution of the respondents (n = 180) regarding information sources of self-medication.

S/No.	Information sources of self-medication	To great extent	To some extent	Never/Not at all
1	Doctors/ Physicians	88 (48.9%)	72 (40.0%)	20 (11.1%)
2	Nurses	19 (10.6%)	74 (41.1%)	87 (41.1%)
3	Internet	61 (33.9%)	75 (41.7%)	44 (24.4%)
4	Relatives or friends	52 (28.9%)	82 (45.6%)	46 (25.6%)
5	Pharmacists	47 (26.1%)	72 (40.0%)	61 (33.9%)
6	Ordinary newspaper or magazines	35 (19.4%)	55 (30.6%)	90 (50.0%)
7	Leaflets concerning medicines	35 (19.4%)	65 (36.1%)	80 (44.4%)
8	Medical books	27 (15.0%)	73 (40.6%)	80 (44.4%)

Figure 4 shows details about the contribution of advertisement of medicines in SM. 63 (35.1%) respondents confirmed that advertisement of medicines is very helpful in SM while 82 (46.1%) showed neutral responses. Only 34 (18.9%) respondents disagreed regarding the contribution of advertisement of medicines in SM.

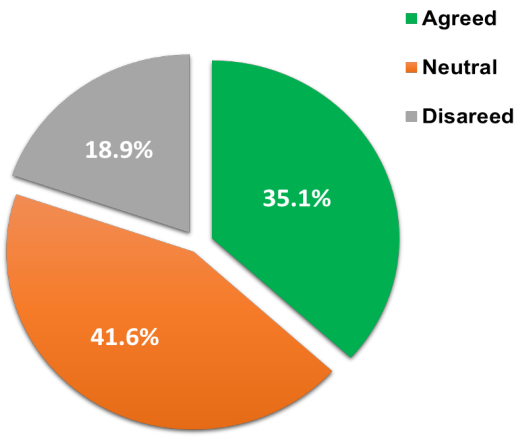

Figure 4. Perception of respondents (n = 180) about advertisement of medicines contributing in SM.

Table 7 shows a close relationship between types of potential adverse effects and awareness of the respondents about medicines. 58 (74.35%) respondents confirmed that they experienced some common side effects, 14 (17.94%) were undecided and 6 (7.69%) respondents did not agree about it. In response of any resistance to drugs/medicines, 45 (67.16%) respondents agreed that SM causes resistance to drugs/medicines and makes certain drugs ineffective, 12 (17.91%) were undecided, and 10 (14.92%) disagreed. When asked about the effects of SM on immune system, 18 (58.06%) agreed that SM causes poor immune system. The 10 (32.25%) respondents were undecided about it, while 3 (9.67%) disagreed about the effects of SM on immune system. Overall for the types of potential adverse effects, among 180 respondents, 124 (68.88%) respondents faced different adverse side effects, 36 (20.0%) were not sure about it and 19 (10.55%) respondents never faced side effects after SM.

Table 7. Awareness about medicines and type of potential adverse effects experienced by the respondents (n = 180) after SM.

Type of potential adverse effects	Awareness about medicine				
	Agree	Undecided	Disagree	Any other	Total
Common side effects	58 (74.35%)	14 (17.94%)	6 (7.69%)	0 (0.0%)	78 (100.0%)
Resistance to drugs/medicines	45 (67.16%)	12 (17.91%)	10 (14.92%)	0 (0.0%)	67 (100.0%)
Poor immune system	18 (58.06%)	10 (32.25%)	3 (9.67%)	0 (0.0%)	31 (100.0%)
Any other	3 (75.0%)	0 (0.0%)	0 (0.0%)	1 (25.0%)	4 (100.0%)
Total	124 (68.88%)	36 (20.0%)	19 (10.55%)	1 (0.55%)	180 (100.0%)
Chi-square: 50.619		DF:19		Significance level: .0000	

4. DISCUSSION

In this study, data regarding steps/measures taken by the respondents during sickness/illness showed that majority of respondents primarily ignored the feeling and did not take any step or measure, while few respondents consulted doctors/physician and few opted SM to treat the disease. Based on the findings of this study that the prevalence of SM practice among female students of the university in Islamabad Pakistan was 32.22% (always practice SM) to 55.6% (sometimes practice SM). A lot of studies have previously reported the prevalence of SM among individuals from different regions of the world [3-7, 19, 23, 24-34]. It has been found that SM in the developing countries is a common practice with prevalence ranging from 25.6 to 73.6%. It is also associated with a positive perception of the country's healthcare system [33]; that's why its prevalence is high in the developing countries [35]. University students are also among the groups having high rate of SM [20, 22, 36]. In Nepal, the reported self-medication rate was 59% in the six-month period preceding while in India, the rate of SM was 31% with extensive variation. For example, in the South Indian coastal areas, 71% prevalence of SM was reported [26]. Study from Saudi Arabia indicated that the SM prevalence among the public was 59% [1] and other inquiries on SM from Saudi Arabia recognized lower prevalence as reported 52.8% in Dammam and higher prevalence of 93.1% in Majmaah and 75.2% in Qassim [5, 6, 34]. From Iran, 44.8% prevalence of SM has been reported among students [7].

Some studies have shown 18 and 87% rate of SM in Iran [37, 38], 86.4% in Brazil [29] and 55% in Egypt [27]. In the Northern Ireland and UK, 41.5% people were using medicines without a prescription of doctor [32]. 27% people in Spain were suffering from pain due to self-medication practices [23]. The high prevalence of SM is a serious issue for the decision and policy-makers in the health sector [32]. It shows that SM practice is very common across health, gender, culture, race, occupation and social status or any other socio-demographic state.

In this study, when asked about the source of obtaining medicines for SM, about 46.1% of the respondents stated that they obtained/purchased medicines for SM from the medical stores without the prescription of doctor/physician. 33.3% from the hospital pharmacy, 14.4 % from the previous treatments or leftovers and 13.9% obtained medicines from friends or family. Parallel outcomes were reported from Ethiopia and Saudi Arabia where the respondents obtained medicines from the previous treatments [1, 3].

Regarding the disease category experienced by the respondent, it was found that majority of the respondent's always choose SM when they got seasonal (40.0%) or viral (21.7%) infections or when there was any emergency /accident (26.1%). In other studies, SM was found to be significantly associated with having a chronic illness as described from Addis Ababa, Serbia and Riyadh [1, 3, 4, 25]. When asked about disease symptoms that lead to SM, data from the respondents here showed that headache (64.4%), cough, flu, common cold (64.4%), abdominal pain (38.3%), allergies (34.4%) and inability to sleep/insomnia (32.2%) were the most common symptoms for which the respondents agreed in practicing SM. Correspondingly, same symptoms have been reported as common in previous inquiries for SM [1, 39, 40]. Gupta *et al*. [41] also reported headache and fever as the most common symptoms treated with SM.

When asked the respondents about the information sources for SM, they revealed that doctors/Physicians (48.9%), internet (33.9%), friends and relatives (28.9%) and pharmacists (26.1%) were the highly consulted sources to get information about SM. According to the World Health Organization, around half of the drugs distributed, prescribed and sold are those which are not justified clinically worldwide [42] and people still use those medicines. A study from Iran also showed in about 40% of students, the social networks and internet were the information sources on SM [7].

Another source of information the respondents revealed was through advertisement of medicines that provide information on SM. In this study, 35.1% of the respondents were agreed about contribution of advertisement in the provision of information on SM while 46.1% of the respondents showed neutral responses and 18.9% were disagreed. Previous studies have reported that the use of advertisements and medical applications for the dissemination of knowledge about SM could be supportive in the management of many chronic diseases [1, 43, 44]. In addition, the sources of information on medicines

including the family, social media and internet can affects the knowledge and the SM practice among consumers [45-46].

Regarding the opinion about side effects, dangers or risks associated with SM, the majority of respondents in this study were aware that SM causes infections and may damage different body organs with the initiation of adverse reactions. Previous inquiries from Riyadh and Dammam Saudi Arabia suggested that the level of knowledge about SM may vary among consumers and there was no surety of safety in SM for many of the respondents [5, 47].

When asked about type of medicine used for SM, majority of respondents confirmed that 49.4% used pain killers, 30.6% used vitamins and 16.7% used antibiotics as types of medicine in SM. A study in Iran reported about 47% of students, using antibiotics as self-prescribed medicine. About 33% of the students widely used two common medicines in SM like the sedatives and cold remedies [7]. Additionally, analgesics and antibiotics are also used frequently for SM in most studies carried out in Finland, Iran, Saudi Arabia, Spain and Turkey [36, 48, 49]. Another study from Iran reported the use of antibiotic as SM among the 53.3% nursing students [50].

When asked about potential adverse effects experienced after SM, majority of the respondents (74.35%) confirmed the appearance of some common side effects after SM. 67.16% experienced drug resistance against other diseases and 58.06% respondent's experienced poor immune system due to SM. Overall for the types of potential adverse effects, 68.88% respondents experienced different adverse side effects, 20.0% were undecided and 10.55% respondents never experienced side effects after SM.

Similarly, previous findings have shown adverse effects of SM including misdiagnosis, long-term use of drugs, ingesting toxic drug doses and drug interactions and associated complications [2, 17]. These adverse effects could worsen the health condition of patient and may leave the disease untreated. Also in many studies, the trend of higher drug usage among the individuals with higher education level as compared to the individuals with low education level have been reported [51, 52]. It has been advocated that the trend of using medicines is influenced by various factors where some are related to the demographic attributes of individual like gender, age, education level, financial status and occupation, etc., and some are related to the knowledge of individuals about medicines. It is believed that SM among patients is the first point where the patients face early disease symptoms which leads to severe side effects like bacterial resistance, drug dependency, intoxication and complicated disease symptoms [14, 17]. Through prompt necessary actions, these side effects could be minimized for safer public health [53].

5. CONCLUSIONS

The prevalence of self-medication (SM) practice is high and common among the female university students of Islamabad, Pakistan. The use of pain killers, antibiotics and vitamins as self-prescribed medicine among the students was higher during seasonal and viral infections including headache, flue, cough, cold and diarrhea or during an emergency or accident. The majority of self-medicating students experienced numerous side effects due to limited knowledge about the risks and side effects associated with medicines. In parallel with the growing SM trend, there is a dire need of spreading knowledge to familiarize the female students about the uses of medicines in consultation with doctors/physicians. Further, some proper policies should be implemented on the advertising and selling of medications with precautionary measures to prevent adverse effects of SM on individual health.

6. ACKNOWLEDGEMENTS

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7. CONFLICT OF INTEREST

The authors declare no competing or potential conflict of interest.

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