ORIGINAL RESEARCH

Prevalence and Drivers of Self-Medication Practices among Savar Residents in Bangladesh: A Cross-Sectional Study

Mst Sabrina Moonajilin[1]
Mohammed A Mamun [1,2,]*
Md Estiar Rahman [1]
Md Firoz Mahmud[1]
AHM Shamim Al Mamun[1]
Md Sajib Rana[1]
David Gozal [3,]*

[1]Department of Public Health and Informatics, Jahangirnagar University, Dhaka, Bangladesh; [2]Undergraduate Research Organization, Dhaka, Bangladesh; [3]Child Health Research Institute, Department of Child Health, University of Missouri School of Medicine, Columbia, MO 65201, USA

*These authors contributed equally to this work

Background: Self-medication practice (SMP) is widely adopted among residents of such countries as Bangladesh. However, the major determinants of SMP have only scarcely been evaluated. Therefore, this cross-sectional study aimed to fill this knowledge gap by assessing the prevalence and determining factors of SMP.

Methods: A convenience sample of individuals residing in Savar (Dhaka, Bangladesh) >16 years of age and suffering from an illness >2 months underwent face-to-face interviews during January–February, 2019.

Results: Among 520 interviewees fulfilling entry criteria, the prevalence of SMP was reported as 60.2%. Drug shops, previous knowledge or prescription, and consulting with peers (friends or relatives) were the most sought sources of SMP, whereas simple illness, higher consulting fees, unsatisfactory health-care services, and delayed access were reported as the motives. From the regression analysis, the sociodemographic risk factors of SMP were reported as being older (compared to <18 years), married, illiterate (compared to having higher education), having engaged in any occupation (ie, service, business, homemaker, and others compared to student), and suffering from chronic illness.

Conclusion: SMP is highly prevalent and exhibits significant socioeconomic determinants. Development of proper health care–access systems and public education should be implemented to reduce the rate of SMP.

Keywords: self-medication practice, prevalence, risk factors, sociodemographic, rural Bangladeshi people

Plain-Language Summary

Self-medication is a common, yet deleterious approach to disease management, and may lead to substantial delays in diagnosis of serious conditions or increase the risk of adverse outcomes. Here, we examined the prevalence of self-medication among residents of Bangladesh and also assessed whether socioeconomic factors played a role. We found an inordinately elevated rate of self-medication among Dhaka residents and that socioeconomic factors accounted for a significant proportion of such practice. We believe that improved access to health care coupled with public education on the risks and dangers of self-medication are urgently needed.

Introduction

The term "medication" usually refers to the act of consuming medicines for prevention and treatment of illness and diseases,[1] whereas "self-medication" (SM)

Correspondence: David Gozal
Child Health Research Institute, Department of Child Health, University of Missouri School of Medicine, Columbia, MO 65201, USA
Email gozald@health.missouri.edu

is defined as the selection and use of medicines by an individual to treat self-diagnosed physical and psychological ailments without a health-care provider's supervision.[2–4] SM usually manifests as the use of herbs and medicines that are available in the home, taking advice from friends or relatives pertaining to the nature and treatment of their condition, or the direct purchase of drugs to address current perceived or real medical problems.[5–8] SM practice (SMP) is currently viewed as potentially being both beneficial or deleterious in public health, contingent on the individual practices that are implemented to deal with common health problems. SMP has been favorably advocated by the World Health Organization, and if practiced appropriately can bring about many possible benefits, including financial advantages, self-empowered health care, rapid access to treatment, and self-reliance in the care of minor illness.[9–11] However, SMPs can promote the occurrence of drug addiction, enhance the risk of drug interactions and adverse drug reactions, foster the occurrence of drug toxicity, increase resistance to pathogens, waste resources, increase polypharmacy, and ultimately lead to incorrect diagnosis and poor outcomes.[3,9,12,13]

According to several recent studies, the rate of SMP appears to be increasing due to a number of socioeconomic and lifestyle factors that include ready access to drugs, increased potential to manage certain illnesses through self-care, and greater availability of medicinal products,[3,14] in addition to advancing age.[15] In addition, when the health-care services available are associated with poor access, uneven distribution of drugs, long distance to hospitals and clinics from home, and elevated physician fees, the likelihood of SMP is further enhanced.[5,10] The prevalence of SMP in developing countries is 36.7%–95%.[16–20] In Bangladesh, the prevalence of SMP in urban areas among a selected (highly literate) sector of the population is about 16%–81%.[5,21–25] The health infrastructure and coverage in the country is clearly suboptimal, and fiscal allocation to national health care is reported as being one of the lowest in the South Asia region (ie, only 2.64% of GDP is spent on health care), such that no health insurance, either national or private, de facto exists.[26] Besides, the presence of unethical drug sellers, improper regulation, and the fact that the vast majority of stocked drugs are sold without any prescription has undoubtedly contributed to furthering the prevalence of SMP in Bangladesh.[27] One common consequence of SMP in Bangladesh, similar to other countries, has been the emergence of high levels of resistance to commonly used antimicrobials, whereby higher rates of resistant bacterial infections persist, due to lack of appropriate administration of antibiotics in the context of self-administration practices.[3,23,28] A recent petition to the High Court of Bangladesh sought juridical decision against immoral drug selling, as up to 80% deaths from infections occurred due to antimicrobial resistance.[29]

However, all aforementioned studies in Bangladesh were conducted in urban areas and involved overall literate participants (ie, medical or university students), such that these individuals could have increased knowledge and access to SMP when compared to rural parts or poor neighborhoods in urban areas of the country where literacy is highly variable.[5,21–24,30] Indeed, both knowledge and education level can have an important impact on SM, whereas illiteracy has been regarded as a silent epidemic in the context of SMP.[31–33] For example, 77% of literate people in Bangladesh were reported to seek advice from retail medicine sellers for minor ailments, such as fever, common cold, allergies, and diarrhea,[30] but we are unaware of any study evaluating SMP among illiterate people. Moreover, the role of professional occupation in SMP has not been investigated, with all aforementioned studies having been conducted among students. However, students usually have free health-care services available on campus, which should negatively influence the prevalence of SMP. As such, the present study was conducted to evaluate the prevalence of SMP and identify potential sociodemographic factors and other drivers among the residents of Savar Upazila, Dhaka, Bangladesh.

Methods
Study Area and Population
The study site was neighborhood areas of Jahanginagar University in Savar Upazila, Dhaka, Bangladesh, situated about 24 kilometers to the northwest of Dhaka, the capital city. Savar is a municipal area consisting of nine wards and 55(neighborhoods). It is 24.1 km^2 and has an estimated population of 124,885 (Figure 1). The existing literacy rate, ie, capable of writing one's name, is 58.2% in this area.

Study Procedure and Inclusion Criteria
This community-based cross-sectional study using convenience sampling was conducted during January and February 2019. Offline face-to-face interviews were conducted in neighborhoods (ie, homes and schools) and
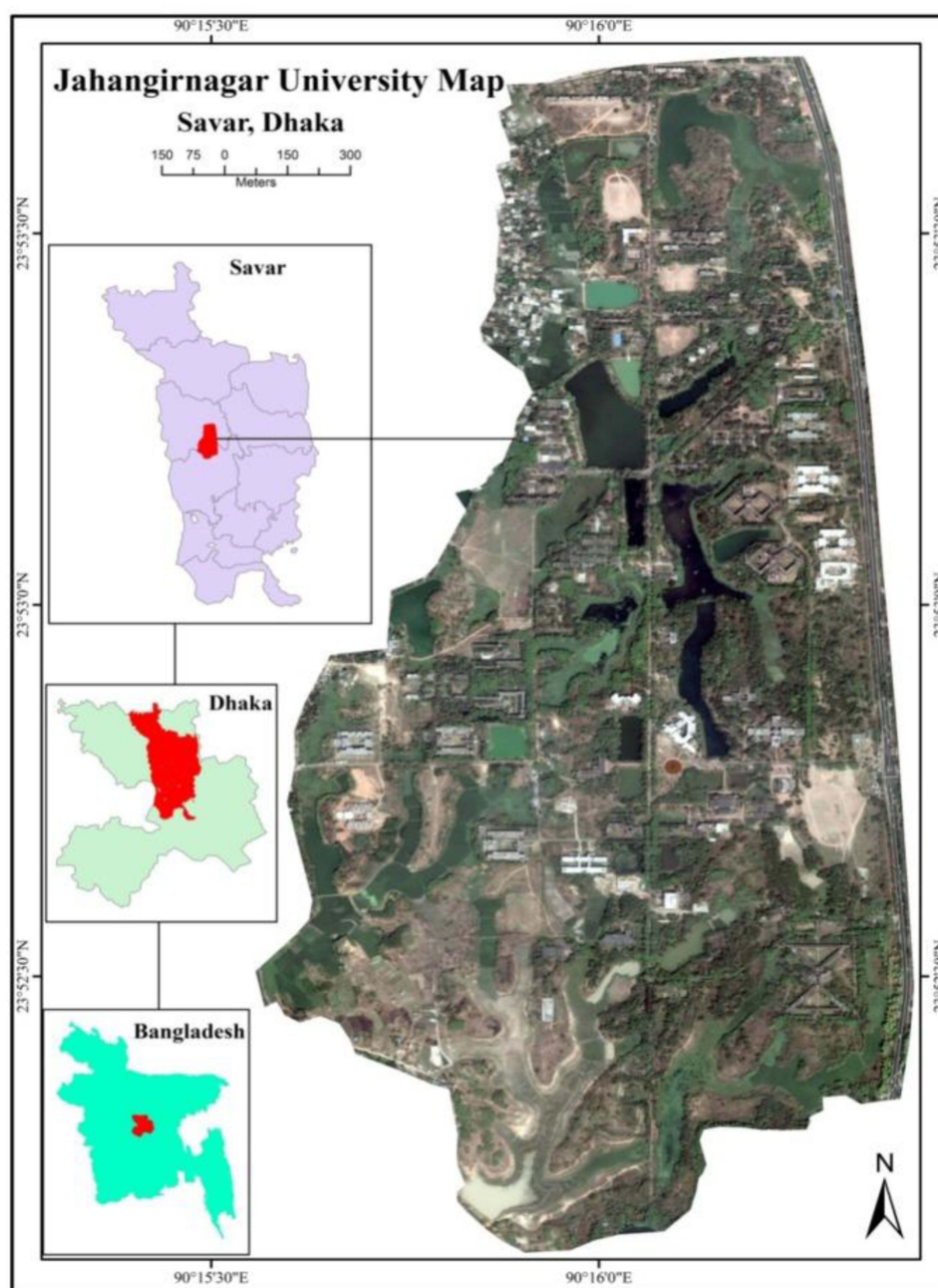
Figure 1 Study location (ie, Savar Upazila, Dhaka, Bangladesh).[35]
Note: Reprinted from Creative Commons license and disclaimer available from: Hossain S, Hossain S, Ahmed F, Islam R, Sikder T, Rahman A. Prevalence of tobacco smoking and factors associated with the initiation of smoking among university students in Dhaka, Bangladesh. *Central Asian Journal of Global Health*. 2017;6(1): e244.Creative Commons license and disclaimer available from: http://creativecommons.org/licenses/by/4.0/legalcode"http://creativecommons.org/licenses/by/4.0/legalcode

working places of Savar. Of the 930 individuals approached, 800 aged >16 years completed the survey. Incorporation of an inclusion criterion consisting of "being ill over the last 2 months", indicative of having severe disabling long-term medical or psychological conditions (eg, intellectual deficits, comorbid medical conditions, child or parental psychiatric conditions)[14] led to the retention of 520 participants (mean age 40.1±13.6 years,

55.6% male) whose interview responses were included in the final analysis.

Measurements

After preliminary observations and review of the literature, a semistructured questionnaire was developed and administered by trained interviewers under the supervision of the principal investigator. The questionnaire required

approximately 30 minutes to complete, and consisted of three parts: sociodemographics, common diseases and care-seeking attitudes, and sources and motives of SM (see Supplemental Online Appendix).

Sociodemographics

Common sociodemographic information, ie, age, sex, marital status, education level, occupation, and religious status, was gathered. For assessment of educational status, "illiterate" was defined as no writing or reading knowledge, "primary education" completing up to fifth grade, "secondary education" completing up to tenth grade, "higher secondary" completing up to 12th grade, and "12+" studying or graduating from university.[34] Common occupations were classified as student, service, business, homemaker, and "other" including farmer, motor-vehicle driver, rickshaw puller, day laborer, etc.

Care-Seeking Attitudes and Self-Medication

Participants were asked if any diseases had affected them over the preceding 2 months (the short period was implemented to reduce recall bias). For accessing health care–seeking attitudes, we used categories of no action taken, consultation with health-care provider, and SM. SM was defined as: "Did you consume medicines by seeking information about drugs from such sources as drugstores, previous experience or prescription, friends or relatives, mass and social media without interaction or prescription of a health-care provider?"[5] Regarding motives for SM, inadequate and dissatisfactory health services near residence, higher cost of consultation with physician, simple illness, lack of time, and others were evaluated.

Ethical Issues

The study was approved by the Biosafety, Biosecurity, and Ethical Committee of Jahangirnagar University (reference BBEC, JU/M 2019[1]4), and conducted in accordance with the Declaration of Helsinki. The purpose of the interview was clearly explained to all prospective study subjects, and formal written and/or verbal (only for the illiterate) consent was obtained. Parental consent was obtained for adolescents. Study subjects were informed that the information collected would be kept anonymous and that their role in the study would be completely voluntary.

Statistical Analysis

Data were analyzed using SPSS version 22.. Descriptive statistics (eg, frequencies, percentages, means, and χ^2) were derived. All categorical variables were compared using χ^2. To identify predictors of SMP, all variables in bivariate analyses were entered into a binary logistic regression model, both unadjusted and adjusted, with SMP as the dependent variable. The results of logistic regression are reported with 95% CIs, and all tests were two-tailed with statistical significance set at 0.05.

Results

Of the 800 participants who completed the interviews, only 520 subjects had suffered from illness in the preceding 2-month period and were retained for final analysis. Their mean age was 40.1±13.6 years, 55.6% were male, and most (48.8%) were in the 18- to 24–year age-group. About 58.3% of the respondents were single, 40.6% had an educational level of higher secondary or more, 43.1% were students, and 94.6% were Muslim. Approximately 23% of respondents reported having chronic illness (Table 1).

Interventional measures initiated by respondents during their illness are presented in Table 2. Results revealed that 60.2% of respondents (n=313) had used SMP. The most common sources of SM were drugstores (32.3%), previous experience (26.2%), advice of friends or relatives (19.2%), mass media (12.8%), and the Internet (9.6%). Moreover, perception of minor illness (58.5) and cost of consultations with doctors (19.2%) were the predominant reasons for SMP among respondents (Table 2).

Age, marital status, education level, occupation, presence of chronic illness, and satisfaction with nearby health services were significantly associated with SMP ($p<0.05$). There were no significant differences in SMP between males and females. SMP increased with increasing age (<18-year-old group served as control; $\chi^2=18.782$, $df=4$; $p<0.001$). The prevalence of SMP was higher among married respondents (67.3%) than those who were single (55.5%, $\chi^2=7.810$, $df=1$; $p=0.005$). Subjects with higher education were less likely to engage in SMP compared to illiterate or lower-education participants ($\chi^2=19.978$, $df=4$; $p<0.001$). Regarding profession, students (52.2%) were less likely to engage in SMP, whereas approximately 73% of nonstudent respondents practiced SMP if they were businessmen or housewives, 61.4% if they were in service jobs, and 68.8% in those with other occupations ($\chi^2=14.093$, $df=4$; $p=0.007$). A significantly higher

Table 1 Distribution of sociodemographic characteristics and health-related factors with SMP (n=520)

	Total, n (%)	Self-medication practice, n (%)	χ^2	df	p-value
Age (years)					
<18	32 (6.2)	15 (46.9)	18.782	4	<0.001
18–24	254 (48.8)	145 (57.1)			
25–29	148 (28.7)	84 (56.8)			
30–35	66 (12.7)	52 (78.8)			
>35	20 (3.8)	17 (85.0)			
Sex					
Male	289 (55.6)	170 (58.8)	0.509	1	0.476
Female	231 (44.4)	143 (61.9)			
Marital status					
Married	217 (41.7)	146 (67.3)	7.810	1	0.005
Single	303 (58.3)	167 (55.1)			
Education					
Illiterate	31 (6.0)	27 (87.1)	19.978	4	<0.001
Primary	22 (4.2)	13 (59.1)			
Secondary	93 (17.9)	58 (62.4)			
Higher secondary	163 (31.3)	108 (66.3)			
Grade 12+	211 (40.6)	107 (50.7)			
Occupation					
Student	224 (43.1)	117 (52.2)	14.093	4	0.007
Service	166 (31.9)	102 (61.4)			
Business	55 (10.6)	40 (72.7)			
Homemaker	59 (11.3)	43 (72.9)			
Others	16 (3.1)	11 (68.8)			
Religion					
Muslim	492 (94.6)	298 (60.6)	0.541	1	0.462
Non-Muslim	28 (5.4)	15 (53.6)			
Presence of chronic illness					
Yes	120 (23.1)	89 (74.2)	12.714	1	<0.001
No	400 (76.9)	224 (56.0)			

percentage of SMP was reported by respondents with chronic illnesses (74.2% vs 56%, χ^2=12.714, df=1; p<0.001; Table 1).

Logistic regression analysis (unadjusted model) further showed that higher age (>35, 30–35, 25–29, and 18–24 years vs <18 years, respectively: OR 6.42, 95% CI 1.57–26.31; OR

Table 2 Measures taken by participants with acute or chronic illness in preceding 2months

		Frequency	Percentage
Measures taken during illness (n=520)			
Treatment at health-care institutions		137	26.3
Rest and wait for relief (no action taken)		70	13.5
Practicing self-medication		313	60.2
Self-medication			
a. Sources (n=313)			
	Drugstores	101	32.3
	Previous knowledge/prescription	82	26.2
	Friends/relatives	60	19.2
	Mass media (ie, TV, newspaper, etc)	40	12.8
	Internet (ie, social media)	30	9.6
b. Motives (n=313)			
	Inadequate medical services near residence	14	4.5
	Dissatisfaction with nearby health-care services	26	8.3
	Cost of consultation with doctor	60	19.2
	Perception of illness as simple	183	58.5
	Lack of time	26	8.3
	Urgency of illness	4	1.3

4.21, 95% CI 1.69–10.47; OR 1.49, 95% CI 0.69–3.20; OR 1.51, 95% CI 0.72–3.15), being married (OR 1.67, 95% CI 1.165–2.407), no education (OR 6.56, 95% CI 2.22–19.40 vs grade 12+), occupation (compared to students: service, OR 1.46, 95% CI 0.97–2.19; businessman, OR 2.44, 95% CI 1.27–4.67; homemaker, OR 2.46, 95% CI 1.31–4.62; other, (OR 2.01, 95% CI 0.68–5.98)), and presence of chronic illness (OR 2.26, 95% CI 1.43–3.55) were all significant and independent predictors in implementation of SMP over the preceding 2 months among respondents (*p*<0.05, Table 3).

Discussion

SMP is a fairly common occurrence in developing countries, such as Bangladesh, where evaluation by a health-care provider is relatively costly and difficult to assume by a large majority in light of their monthly income and cost of living expenses.[13,22] However, the role of age, education, occupation, and other sociodemographic factors in SMP has not been explored to date. Therefore, the current study provides initial observations on the determinants of SMP among a cohort of residents of Savar, Dhaka in Bangladesh.

To obviate the issues of no-recall or recall bias, we focused only on responses obtained from participants who had experienced illness during the 2 months preceding the survey. In these subjects, the prevalence of SMP was 60.2%,

higher than that reported in several studies in Bangladesh involving students. Indeed, SMP prevalence was 47% among medical students in Dhaka[22] and 16% among private university students in the same city.[21] However, several other studies have shown a very wide range of SMP. In a study conducted by Seam et al,[5] prevalence as high as 81% was found among undergraduate students attending five universities located in different regions of the country, whereas prevalence of 81.4% was reported among medical students in Dhaka.[25] Furthermore, Biswas et al found SMP prevalence of 26.7% for antibiotics and 73.3% for other medication,[23] and 62.2% of children (aged 0–12 years) residing in Dhaka have been reported as engaging in SMP by their parents or caretakers.[24] Moreover, SMP prevalence varies greatly around the world, eg, up to 78.6% in India,[1,15,36] 61.2% in Pakistan,[37] up to 94.5% in Saudi Arabia,[2,4,17] up to 39% in Ethiopia,[10,14] 98% in Palestine,[38] 36.7% in Oman,[16] 53.4% in Italy,[39] 83% in Iran,[20] 79.9% in Serbia,[18] 78.5% in Jordan,[40] and up to 73.5% (antibiotics) in China.[41]. Therefore, the prevalence of SMP found in the current study is clearly within the ranges previously reported elsewhere, although the time frame of SMP has not been compared.

Bangladesh is a country in which no systematic policies and regulations regarding proper drug administration,

Table 3 Logistic regression analysis of sociodemographic characteristics and health-related factors with SMP (n=520)

	Unadjusted model			Adjusted Model		
	Unadjusted OR	95% CI	p-value	Adjusted OR	95% CI	p-value
Age (years)						
<18	Reference		0.0017	Reference		0.028
18–24	1.508	(0.721–3.152)		2.101	(0.816–5.406)	
25–29	1.487	(0.691–3.202)		2.044	(0.704–5.936)	
30–35	4.210	(1.692–10.471)		5.200	(1.529–17.682)	
>35	6.422	(1.568–26.309)		7.115	(1.357–37.311)	
Sex						
Male	0.879	(0.617–1.253)	0.476	0.857	(0.560–1.314)	0.480
Female	Reference			Reference		
Marital status						
Married	1.675	(1.165–2.407)	0.005	0.821	(0.461–1.462)	0.502
Single	Reference			Reference		
Education						
Illiterate	6.561	(2.219–19.401)	0.001	3.761	(1.065–13.279)	0.004
Primary	1.404	(0.576–3.425)		0.820	(0.228–2.949)	
Secondary	1.611	(0.978–2.652)		2.069	(1.061–4.038)	
Higher secondary	1.909	(1.251–2.911)		2.210	(1.354–3.609)	
Grade 12+	Reference			Reference		
Occupation						
Student	Reference		0.008	Reference		0.519
Service	1.458	(0.969–2.192)		0.978	(0.535–1.787)	
Business	2.439	(1.275–4.666)		1.793	(0.804–3.999)	
Homemaker	2.458	(1.308–4.619)		1.187	(0.466–3.019)	
Others	2.012	(0.677–5.979)		1.959	(0.402–9.553)	
Religion						
Muslim	1.331	(0.620–2.859)	0.463	0.979	(0.443–2.163)	0.959
Non-Muslim	Reference			Reference		
Presence of chronic illness						
Yes	2.256	(1.433–3.552)	<0.001	2.359	(1.466–3.797)	<0.001
No	Reference			Reference		

distribution, and control of drug sales are applied.[23] As such, anyone can buy drugs without the need for a medical prescription. This situation leads to many drugstores acting in a consulting capacity to the public.[22] Accordingly, it was not surprising that one of the principal sources of SMP resides in drugstores, a finding that has been corroborated by many studies conducted in different parts of the world.[1,2,14,22] However, other important factors in this study leading to SMP included suffering from a simple illness (eg, fever, acidity, common cold, headache, abdominal pain, cough, back pain). The rationale for individuals with simple acute illnesses not willing to pay the relatively onerous fee of a health-care provider is quite obvious, yet for more complex or protracted conditions, the high rate of SMP is definitely concerning.[1,5,10,14,16,22] Other reasons for SMP, including dissatisfaction with existing health-care services, lengthy waiting times to access health-care facilities, or inadequate medical services near residence, were also apparent, similar to previous reports.[5]

Herein, the prevalence of SMP increased with age, suggesting that older individuals are more experienced in handling common conditions, and when affected by minor or even chronic illness are more likely to resort to SMP.[20,42] It is also worth noting that we found that individuals who suffered from the same illness repeatedly were more likely to adopt SMP and use previously prescribed drugs.[2] We observed that marital status influenced SMP rates, with being married being associated with increased SMP rates,[18,20,42] likely reflecting some degree of collinearity, since married status is more likely with older age and also with employment in which employed and particularly busier individuals may not have the necessary time to consult with health-care providers, particularly when simple ailments are affecting them.[2]

Illiterate individuals were significantly more likely to use SMP, with nearly a sevenfold increase in odds of SMP compared to those with education level of grade 12+. Education-attainment levels have been found to be significant predictors of SMP in other studies.[32] Usually, illiterate individuals are less aware of potential side effects linked to concurrent use of medications and also less likely to scrutinize whether they are obtaining proper treatment.[31,33] These issues predispose them to frequent purchases of medications suggested by drugstore employees, without seeking physician consultation or prescription.[5,22,31] However, contrary to our findings, we should also point out that seeking information from online sources, magazines, or periodicals can promote SMP behavior among literate individuals.[43]

Limitations and Further Study

There were a number of limitations to this study. First, it was cross-sectional without any interventions seeking to alter SMP behaviors that might have provided improved insights into its determinants. Additionally, we did not consider detail in motives for SMP for each separate condition, but rather collapsed our findings by aggregating them over a period of 2 months. It is also possible that despite the relatively large sample, sampling approaches, and whether the cohort was representative of the population being evaluated might have reduced its generalizability to both Bangladesh and other countries. Moreover, self-reporting data aboutSM in the preceding 2 months requires recall and brings the possibility of desirability bias, which could have affected our findings. Potential extraneous influence by fellow respondents cannot be ruled out with certainty, even if precautions were taken for respondents to complete their survey independently. Therefore, this study suggests a need for further investigations among a nationwide representative population of the country in consideration of the yielded factors.

Implications of the Study

This study provides a static evaluation of the health care–delivery system in Bangladesh, with particular emphasis on the attitudes and practices of SM. Only 26.3% of participants had accessed health-care institutions for treatment and care, which illustrates the fact that SMP is driven by poor access, among other factors. Moreover, the rate of SMP was notably high, and several important risk factors were identified, which might be of interest and useful to policy-makers regarding more formal regulation of SMP. Indeed, such initiatives as those aiming to increase health education, social awareness, awareness regarding the illness, and which illnesses can be safely managed initially by SMP and which are not adequate for SMP could optimize the utilization of SMP without necessarily leading to some of its negative outcomes.

Conclusion

This study revealed a high rate of SMP among the general population of Savar Upazila in Bangladesh, an observation that should draw the attention of policy-makers and other health-care organizations to this issue, while providing insights into socioeconomic determinants of such behaviors. Our findings should encourage greater exploration of the role of SM in health care, particularly in countries with a relatively

inaccessible health infrastructure, while also enabling public information channels on the potential hazards posed by SMP.

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Disclosure

The authors report no conflicts of interest in this work.

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