# FACTORS INFLUENCING SELF-MEDICATION AMONG STUDENTS OF UNIVERSITY OF GHANA, LEGON

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## Abstract

***Objectives:*** To determine the factors influencing self-medication among students of the University of Ghana (UG), Legon

***Methods:*** We conducted a descriptive cross-sectional study among UG students and collected primary data from 396 students using a structured questionnaire through a systematic sampling technique. Data on the demographic characteristics, health seeking behaviour and knowledge on the implications of drugs were analysed using Stata 14.1 and chi-square test was used to determine the association between the dependent variable (self-medication) and the independent variables (factors influencing self-medication) under study.

***Results:*** The prevalence of self-medication among the students was 48.0% [95% CI 43.1-53.0]. The reasons associated with this were: the believe that the condition didn't merit a physician visit (42.1% p=0.000), familiarity with treatment options (36.8% p=0.000), lack of time (14.7% p=0.000), lack of primary physician (6.8% p=0.000) and the lack of a valid insurance (1.9% p=0.070). Regardless the free medical services available to the students at the University's health facilities, 128(67.4%) students would practice self-medication. Long hours of waiting (39.3%), quick relief from sickness (28.0%), distance to the hospital (18.0%) and the negative attitude of physicians (18.0%) were some of the reasons given. However, 22(11.6%) [95% Cl 07.7-17.0] have suffered some form of Adverse effect from self-medication.

***Conclusion:*** Self-medication is prevalent among students due to time constraints and unpleasant attitude of health care providers. The University Hospital in collaboration with Ghana Health Service should organize public lectures on self-medication and address students' challenges.

## Background

Self-medication is the act of obtaining and consuming drug(s) without the advice of a physician for the treatment of self-diagnosed symptoms or illness[1]. Self-medication has drawn global concerns over the years due to the increasing rate of Over-the-Counter drugs' ill-use. The true prevalence of self-medication is not certain as most surveys conducted are self-reported; the prevalence in developed countries are 3% –19% while developing countries are 9% – 100% [2,3,4]. Most developing countries have the highest frequencies due to poor regulatory systems [5,6] coupled with the act being considered a normal practice [7].Virtually everyone, including doctors, nurses, pharmacists, neighbours, families and friends as well as the media (print and electronic), contribute to this health issue[8–10]. In the presence of conscious improvement in individuals' education, knowledge and socioeconomic status, the practice of self-medication minimizes the pressure on

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medical facilities and helps indigenes from remote areas access medical services[11]. The need to seek professional health care then arises when the condition fails to respond to the drug or when the condition persists. But self-medication also has negative consequences on the health and wellbeing of people. It results in wastage of resources, increased resistance of microbes to drugs and Adverse Drug Reaction (ADR)[12–14]. Awareness of these implications may encourage people to seek hospital intervention for proper medical examination, diagnosis, and treatment of their illnesses. According to WHO, "*a response to a drug which is noxious and unintended, and which occurs at doses normally used in man for the prophylaxis, diagnosis, or therapy of disease, or for the modifications of physiological function*" is an Adverse Drug Reaction. Simply, an appreciably unpleasant or harmful reaction of a drug that occurs during usual clinical use and dosage.

Self-medication is common among the youth (students)[8,12,15–17] especially among medical, nursing and pharmacy students[10,18–22]. Some factors associated with self-medication include; individual life style, accessibility and availability of drugs, the drive to treat certain illnesses through self-care, the lack of healthcare facility, exposure to advertisement and education[9,15,21].

Some other factors include; socioeconomic status (e.g. educational level, access to medical information, awareness of health), and cost of consultation.

Furthermore, students also use prescription-only drugs such as antibiotics and antimalarials in self-care[2,15,23]. Some students hold the perception that antibiotics are suitable for viral infections[8,9]. High level of education ironically increases the practice of self-care of which tertiary students are culprits of the practice[15,21,24,26]. In Ghana, the practice is also common among health care practitioners[27]. The magnitude and factors associated with self-medication among students in tertiary institutions has not been extensively studied in Ghana. A study has however been done among university students with focus on antibiotic use[28]. The practice when not properly checked, creates a greater probability of inappropriate, incorrect diagnosis, undue treatment therapy, pathogen resistance, adverse drug effects and increased morbidity. Thitherward, with the practice being a health management behavior among students, an improved knowledge, awareness and understanding about self-medication may have a positive impact in reducing the negative implications associated will the ill-use. University of Ghana offers free medical services to its student population and refunds monies on drugs purchased by prescription-only. Therefore, we conducted the study to determine the factors influencing self-medication among students of the University of Ghana.

## Methodology
### Study Design and Study Site
We conducted a descriptive cross-sectional study to assess self-medication practices among students through the use of a structured questionnaire between May and July, 2017. The University of Ghana is located in Accra, the Capital of Ghana and has its main campus at Legon. The school has a growing number of international students from over 70 countries. There are 16 Halls of residence located at different sections of the campus. Most of the halls are within catchment areas of four pharmacy shops that provide pharmaceutical services.

### Study Variable
The dependent variable was self-medication and the independent variables included; gender, educational level, college of students, sources of drugs, type of drugs and knowledge on free medical services for students. Self-medication was defined as the act of obtaining and consuming drug(s) without the advice of a physician for the treatment of self-diagnosed symptoms or illness.

### Sample size and sampling procedure
The sample size was calculated based on the Cochran formula; $N = (Z^{2*} (p) (1-p))/d^2$ at 95% confidence interval and 5% margin of error. We assumed a prevalence of 62.9% based on a similar study[29]. The calculated sample size was 359. Systematic random technique was used to select 25 rooms in each of the 16 halls of residence. These halls have varied population sizes and rooms, as such the total number of rooms in each hall of residence was divided by 25 and every nth of that was used to select a room for the study. An individual from each room was then selected via balloting in cases where they were two or more.

### Data collection technique and Analysis
We trained data collectors and pre-tested the questionnaire at the University of Cape Coast. The trained data collectors obtained information through a self-administered questionnaire that had three main sub-headings; socio-demographic characteristics, factors influencing health seeking behavior and students' knowledge on the implication of drugs. The respondents were encouraged to fill the questionnaire independently. The average time spent per respondent on the questionnaire was 25 minutes. Thereafter, the questionnaire was in each case cross-examined to ensure they are properly, completely filled and valid.

Initial data collected using the questionnaire was coded sequentially with a unique identification number and entered into Statistical Package for Social Sciences (SPSS) version 23.

The data was imported into STATA 14 statistical software. The data was clean to ensure accuracy and completeness. Then, analyzed at a 95% confidence interval. Chi-square test was used to establish any association between self-medication and the variables under study.

### Ethical Consideration
Ethical clearance was obtained from the Ghana Health Service Ethics Review Committee (GHS-ERC: 48/02/17). Permission was sought from the Dean of students and Hall Tutors before approaching the students. Informed Consent was obtained from students before their participation in the study. Participation was entirely voluntary and participants were free to withdraw at any time. Full participation was however encouraged to ensure that the questionnaires were adequately filled to avoid incomplete data. Anonymity was ensured as the participants were told not to write their names and ID numbers on the questionnaires. Participation was strictly confidential as the participants were left to fill the questionnaire themselves.

## Results
### Baseline characteristics of participants:
Three hundred and ninety-six (396) students participated. The demographic characteristics of the respondents are shown in Table1.

The mean age of Students was $22.6 \pm 0.2$ years. One hundred and ninety respondents representing 48.0% [95% CI 43.1-53.0] would as a first line of action practice self-medicate (190/396).

The demographic characteristics were subjected to a chi-square test to determine the association with the practice of self-medication as shown in Table 2.

**Health seeking behavior**

Among the self-treated respondents 42.1% (p=0.000) believed their conditions did not merit a physician visit while 36.8% (p=0.000) noted they were familiar with treatment options. Other explanations included: the lack of time (14.7% p=0.000); lack of primary physician (6.8% p=0.000) and invalid health insurance (1.9% p=0.070). Four respondents (4/190) representing 2.1% p= 0.036 stated other reasons (insecurity, distrust in the health system and shyness) (Table 3)

Due to the multiple nature of the responses, there were 239 responses among the 190 self-treated students in regards to the source of medications used. Out of which, 70.7% (169/239) respondents mostly obtained their drugs from the pharmacy, 8.9% (21/239) had roommates giving them the drugs, 7.5% (18/239) took left over medicines from their home and 5.0% (12/239) obtained drugs from relatives. A proportion of 4.6% (11/239) obtained it from shopping centres while 2.5% (6/239) obtained it as a result of left-over medications given to them during previous visits at the University hospital and 0.8% (2/239) obtained it from other sources (online and market) (Figure 1).

Among the 190 self-treated students, there was a 99.0% (188/190) response rate but due to the multiple nature of responses a total of 318 responses were recorded for the type of medication used. The most frequent drugs used for self-medication were antibiotics 37.1% (118/318), antimalarials 17.9% (57/318) and analgesics 13.2% (42/318) (Figure 2).

**Table 1:** Demographic characteristics of respondents and their first line of action when ill.

| Variables | Self-medicate | Consult doctor | Ignore feeling | Rest/Pray |
|---|---|---|---|---|
| | Frequency (%) | | | |
| **Sex** | | | | |
| Male | 86 (21.7) | 38 (9.6) | 58 (14.6) | 14 (3.5) |
| Female | 104 (26.3) | 25 (6.3) | 54 (13.6) | 17 (4.3) |
| **Nationality** | | | | |
| Ghanaians | 168 (42.4) | 60 (15.2) | 107 (27.0) | 30 (7.6) |
| Foreign nationals | 22 (5.6) | 3 (0.8) | 5 (1.3) | 1 (0.3) |
| **Marital Status** | | | | |
| Single | 185 (46.7) | 58 (14.6) | 106 (26.8) | 31 (7.8) |
| Married | 5 (1.3) | 4 (1.0) | 5 (1.3) | 0 |
| Widowed | 0 | 1 (0.3) | 1 (0.3) | 0 |
| **Educational Level** | | | | |
| 100 | 27 (6.8) | 8 (2.0) | 17 (4.3) | 4 (1.0) |
| 200 | 28 (7.1) | 12 (3.0) | 16 (4.0) | 4 (1.0) |
| 300 | 38 (9.6) | 10 (2.5) | 15 (3.8) | 6 (1.5) |
| 400 | 50 (12.6) | 19 (4.8) | 41 (10.4) | 5 (1.3) |
| 500 | 5 (1.3) | 0 | 0 | 1 (0.3) |
| 600 | 32 (8.1) | 10 (2.5) | 17 (4.3) | 7 (1.8) |
| Others (PhD) | 10 (2.5) | 4 (1.0) | 6 (1.5) | 4 (1.0) |
| **College** | | | | |
| Basic & Applied Sciences | 52 (13.2) | 22 (5.6) | 31 (7.9) | 13 (3.3) |
| Education | 2 (0.5) | 4 (1.0) | 3 (0.8) | 0 |
| Health Sciences | 27 (6.8) | 8 (2.0) | 9 (2.3) | 4 (1.0) |
| Humanities | 109 (27.6) | 29 (7.3) | 68 (17.2) | 14 (3.5) |

**Table 2:** Association of demographic predictors of self-medication.

| Variables | First line of action when ill N (%) | | X² | p-value |
|---|---|---|---|---|
| | Self-medicate Yes | Self-medicate No | | |
| **Sex** | | | 2.62 | 0.106 |
| Male | 86 (46.26) | 110 (53.40) | | |
| Female | 104 (54.74) | 96 (46.60) | | |
| **Nationality** | | | 7.12 | 0.008* |
| Ghanaians | 168 (88.42) | 197 (95.63) | | |
| Foreign nationals | 22(11.58) | 9 (4.37) | | |
| **Marital Status** | | | 2.76 | 0.251 |
| Single | 185 (97.37) | 195 (94.66) | | |
| Married | 5(2.63) | 9 (4.37) | | |
| Widowed | 0 (0.00) | 2 (0.97) | | |
| **Educational Level** | | | 0.05 | 0.825 |
| Undergraduate | 143 (75.26) | 157(76.21) | | |
| Post-graduate | 47(24.74) | 49(23.79) | | |
| **College** | | | 4.64 | 0.200 |
| Basic & Applied Sciences | 52 (27.37) | 66(32.20) | | |
| Education | 2(1.05) | 7(3.41) | | |
| Health Sciences | 27(14.21) | 21(10.24) | | |
| Humanities | 109(57.37) | 111(54.15) | | |

**P-value*< 0.05**

**Table 3:** Reasons' respondents gave for practicing self-medication

| Reason | Self-medicate | | X² | p-value |
|---|---|---|---|---|
| | Yes | No | | |
| **Lack of time** | | | 32.6677 | <0.01 |
| Yes | 28 (14.74) | 0(0.00) | | |
| No | 162 (85.26) | 206(100.00) | | |
| **Lack of Primary Physician** | | | 14.5731 | <0.01 |
| Yes | 13(6.84) | 0(0.00) | | |
| No | 177(93.16) | 206(100.00) | | |
| **Invalid Insurance** | | | 3.2775 | 0.070 |
| Yes | 3(1.58) | 0(0.00) | | |
| No | 187(98.42) | 206(100.00) | | |
| **Familiar with treatment option** | | | 92.1912 | <0.01 |
| Yes | 70(36.84) | 0(0.00) | | |
| No | 120(63.16) | 206(100.0) | | |
| **Condition do not merit physician visit** | | | 108.6955 | <0.01 |
| Yes | 80(42.11) | 0(0.00) | | |
| No | 110(57.89) | 206(100.00) | | |
| **Others (insecurity, distrust in the health system and shyness)** | | | 4.3811 | 0.036 |
| Yes | 4(2.11) | 0(0.00) | | |
| No | 186(97.89) | 206(100.00) | | |

**P-value*< 0.05**
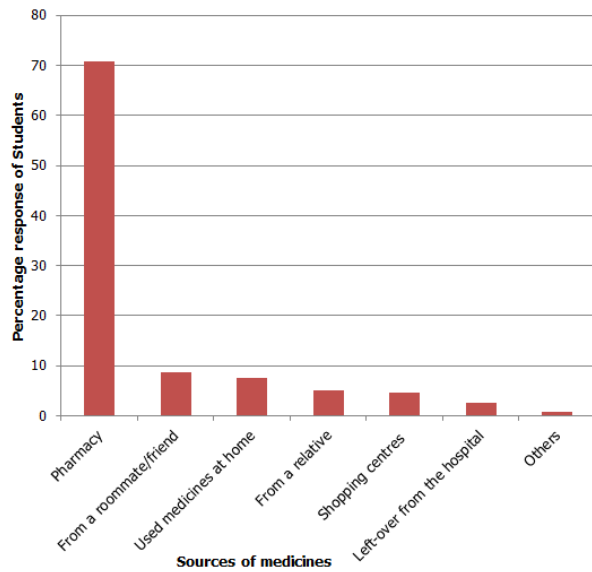
** Multiple responses
Figure 1: Sources of medicines used by students
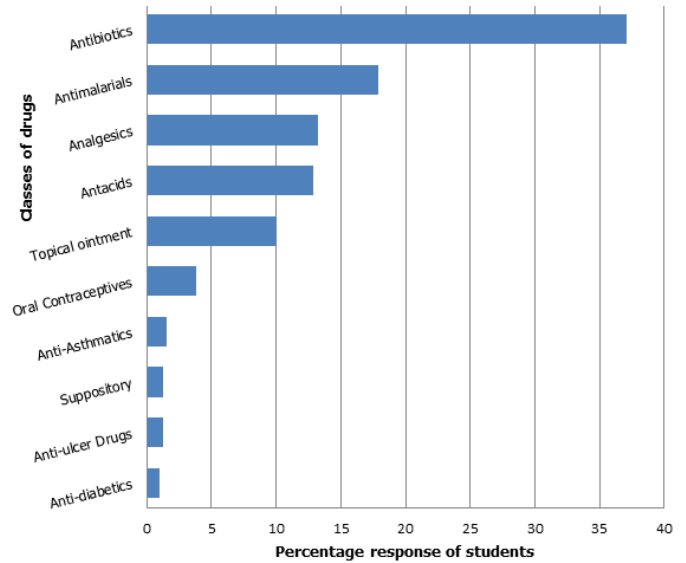


** Multiple responses
Figure 2: Classes of medicines used by students

**Students' Knowledge on the implications of self-medication**

Among respondents who practice self-medication, one hundred and fifty-seven (157) agreed having knowledge on the free medical services in the University hospital. One hundred and twenty-seven (127) respondents, representing 81.9% (127/157) stated they would self-medicate regardless of their knowledge on the free medical services. Respondents had multiple reasons for practicing self-medication, these included; waste of time in the hospital 39.3% (66/168), the need for a quick relief 28.0% (47/168), the hospital being distant 18.0% (23/168), attitude of physicians 18.0% (23/168) and other reasons (familiarity of treatment options and shyness) 5.4% (9/168) (Figure 3).

Among the self-treated respondents, eighty-five respondents representing 45.5% (85/187) indicated that they had had knowledge on ADR. From that, a total of 22 respondents representing 11.6% [95% Cl 7.7%-17.0%] self-treated students had suffered from Adverse Drug Reaction presumably confirmed by a physician/ pharmacist; as 10 out of 22 had knowledge on ADR through a physician or pharmacist. The drugs implicated in these adverse reactions included; Antimalarials 9 (40.9%); Antibiotics 8 (36.4%) and Oral contraceptives 5 (22.7%). (Figure 4) shows a pie chart of the drug classes that cause ADR among respondents that practice self-mediation by sex.

Among the 190 self-treated respondents, there was a response rate of 94.2% (179/190) regarding knowledge on implications of self-medication. Respondents knew at least one implication of drugs; Adverse Drug Effect 43.6% (78/179), drug resistance 43.6% (78/179), severity of condition 31.3% (56/179) and wastage of drugs 15.6% (28/179) (Table 4).
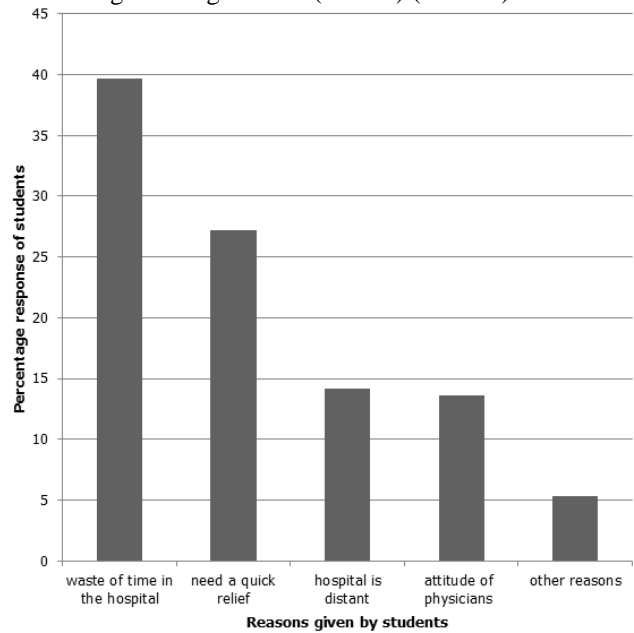


** Multiple responses
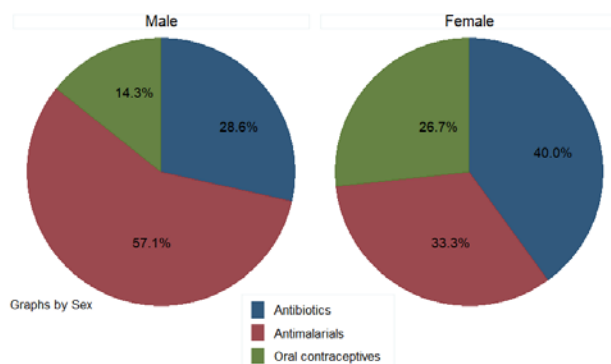Figure 3: Reasons for self-medicating amidst knowledge of free medical services.

Figure 4: Drug classes that cause ADR among respondents

**Table 4:** Knowledge of self-treated respondents on the implication of drugs**

| Knowledge of respondents | Frequency (%) |
| --- | --- |
| Adverse drug effects | 78 (43.6) |
| Drug resistance | 78 (43.6) |
| Severity of conditions | 56 (31.3) |
| Wastage of drugs | 28 (15.6) |

## Discussion

The study found that self-medication was common among students of University of Ghana, Legon. It has been reported however that the incidence of self-medication is dependent on how the questions are constructed in the questionnaire[30] where questioning current practice yielded high rates[8,31–34]. Our results do not align with such claims as participants were encouraged to report the practice of self-medication only based on their experience upon entry into the university.

Our study showed no real association between the practice of self-medication and the demographic characteristics[4,6,11]. However, the nationality of respondents and the practice of self-medication was statistically significant; this might be because, foreign nationals are not familiar with the health system. Thus, the practice was prevalent among foreign nationals than among Ghanaians. The study showed 48.0% of students practiced self- medication as a first line of action when ill. This is similar to reported rates of 47.9% at Jiangsu University (JSU) and 47.8% at Shantou University (STU) in China[2]. The practice of self-medication occurs more frequently amongst females (54.8%) than in males (45.2%) but this difference was not statistically significant thus, consistent with previous studies conducted among students in Nigerian and Nepal[11,16].

Forty percent of the respondents that self-medicate as a first line of action believed their conditions did not merit a physician visit, similar to findings among medical students[16]. While 36.8% respondents were familiar with treatment options, 14.7% noted it was due to the mere lack of time, 6.8% explained it was due to the lack of primary physician, 2.1% and 1.9% had other reasons and noted it was due to the lack of a valid health insurance respectively. The main reasons for self-medication were similar to findings among Slovenia students[8]. Similarly, findings from this study were in line with those reported among students of Universities in other countries [31,36,37].

Studies conducted among students in Nigeria[8,11] indicated that most students obtained their drugs from the pharmacy. Reminiscently, this study revealed a greater proportion of medicines were obtained from the pharmacy (70.7%), similar to a study in India[17]. Also, 8.9% respondents had roommates/friends giving them the drugs possibly due to the hospitable nature of Ghanaians, 7.5% took left over medicines from their homes, 5.0% obtained it from relatives and 4.6% obtained it from shopping centers. Only 2.5% and 0.8% obtained it as a result of left-overs from medications given at the University hospital and from other sources (online and market) respectively[7,10,38]. The websites where drugs are purchased from and the mode of delivery were however not mentioned.

There was wide range of drug classes used by students in this study. The most frequent drug used for self-medication was antibiotics (37.1%) similar to what was reported among University of Lahore students[39]. This was followed by antimalarials (17.9%); which may be attributed to the high prevalence of malaria cases in Ghana and the readily accessible means of procurement. The use of antibiotics and antimalarials without the guidance of a medical practitioner may result in the likelihood of inappropriate, incorrect, or undue health care, incomprehensible diagnosis, microbial resistance and accrued morbidity[9]. The nature of the study did not permit us to investigate the names of the individual drugs used by students.

The University of Ghana offers free medical services to its students. However, among the self-treated respondents, one hundred and fifty-seven (157) had knowledge of the free medical services in the hospital out of which 80.9% would self-medicate be what may. Most of the reasons respondents gave were, the long hours of waiting time (39.6%) which corresponds to the

findings of a study conducted among University students in South-Western Nigeria[12]. About Twenty-seven percent of students noted they needed a quick relief while 14.2% indicated the average 2.5 km distance to the hospital was limiting.

Approximately 13.6 percent also indicated that, the negative attitude of physicians deters them. Medical services should be convenient to anyone that seeks medical attention; one should not avoid health care because of the unfriendly nature of health practitioners. High self-care practices is as a result of the knowledge gap of self-medicating and possible implications[40]. This was evident as respondents had little knowledge on the implication of drugs, aside their side effects. Forty-four percent of respondents knew about drug resistance, 44% Adverse Drug Effect and 31% had knowledge on the severity of condition (deterioration or worsening of medical condition) as an implication of drugs. An estimated 12% among the self-treated respondents suffered an Adverse Drug Reaction as a result of self-medication. This was however perceived ADR experienced as the study could not ascertain the accuracy of their claims. The drugs that were implicated are; antimalarials, antibiotics and oral contraceptives. Pharmacists should relentlessly counsel, build awareness about medical products, provide sufficient detailed information on probable effects of products on health, recommend reasonable dosage and perform follow-ups.

**Limitations:** To control self-reporting bias regarding social desirability and recall biases, two measures were taken. Social desirability bias was reduced by assuring respondents of their anonymity and providing confidentiality especially where balloting had to be done to select a respondent from a room. Recall bias was controlled by facilitating recall through the provision of a manual that included the definition of self-medication, Adverse Drug Reaction and classes of drugs. This harmonized their perceived meanings of definitions and their actual meanings. For instance, some students didn't know pain killers were also known as analgesics or pain relievers. This curbed any undue advantage respondents from the sciences might have over those from other fields of study.

Another limitation worth mentioning has to do with the ADR experienced by respondents. The study could not unilaterally confirm/deny the claims of respondents as we could not ascertain whether their experiences were as a result of some disease progression that presented itself as ADR and/or as such was proven by a licensed physician or pharmacist. Even though, almost fifty percent of respondents noted they knew about ADR through a physician or pharmacist. As a result, the ADR as experienced by respondents were treated as perceived ADR rather than one that was clinically proven.

## Conclusion

Self-medication was prevalent among students of University of Ghana, Legon regardless of the free medical services at the hospital. Long waiting time, urgent need of relief from sickness, distance to the hospital, unpleasant attitude of some physicians were some of the reasons for the practice. Proportionally, the practice was most common among the female population; this however was not statistically significant. The most commonly used class of drugs is antibiotics, anti-malarials and analgesics obtained from pharmacies and roommates/ friends. Students showed some level of knowledge on the implication of drugs aside side effects of drugs. The proportion of students that had experience an Adverse Drug Reaction whilst self-medicating was quite high.

## Recommendation

The Univerity Hospital should collaborate with the Ghana Health Service to organize symposiums which address the concerns of the students. Even though the pharmaceutical industry is a private business, the University Hospital should liaise with pharmacies on the campus to bridge the gap in the delivery of health care to ensure that prescribers have adequate knowledge on the history of students before any prescription is made.

## Acknowledgment

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