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Self-Medication among Students in the University of Papua New Guinea

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Abstract

The inappropriate use of over-the-counter (OTC) and prescription medicines to self-medicate can cause significant medical problems. This cross-sectional descriptive study assesses prevalence and factors associated with self-medication among students in the University of Papua New Guinea during the 2005 academic year. Data from randomly selected consented students on the Taurama and Waigani campuses of the University of Papua New Guinea were obtained by self-administered, structured, pre-tested questionnaires. The sample size for the two campuses was calculated using the "proportionate to population size" (PPS) cluster sampling technique. A total of 583 questionnaires were distributed as follows, 124 (21.3%) among students on Taurama campus and 459 (78.7%) among students on Waigani campus. However, only 309 (53%) of the questionnaires received from all the students were suitable for analysis. Data for all the 309 students indicate that OTC and Prescription medicines were used in 710 instances (63.8%) and 402 instances (36.2%) respectively. Paracetamol was the most frequently (59.6%) used OTC medicine. Antibiotics (54.5%) and Antimalarials (45.5%) were the prescription medicines used for self medication. For antibiotics, Amoxicillin (89.5%) was the most frequently used. For antimalarial medicines, Chloroquine (47.5%) and Artemether (38.3%) were the most frequently used for self medication. Headache and malaria were the most common symptoms for self-medication, whereas the most common reasons were previous experience of treatment in relation to symptoms and mild illness. Sources of medicines for self-medication were friends (53.8%), pharmacy (52.6%) and supermarkets (43.1%). There was no significant difference in the inappropriate use of medicines by students on Taurama campus compared to those on Waigani campus. Self-medication practices were similar among students on both campuses. There is a need for intensive education and comprehensive awareness campaign to advocate for reduction in the prevalence of self-medication practices among students on both campuses in the University of Papua New Guinea.

Keywords: Self-medication, Students, Over-the-counter, Prescription, Medicines

Introduction

The use of medicines to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of prescribed medicines, without consultation with qualified medical practitioners, for chronic or recurrent disease or symptoms is considered as self-medication (1, 2). In most developed countries self-medication is a major component of the primary health care system. Rational use of over the counter (OTC) medicines can be achieved by appropriate labelling, information leaflets and also by ensuring that pharmacists or physicians give all necessary additional information or professional advice to consumers (1–3).

The use of prescription medicines for self-medication is common practice in some developing countries (2 – 6). Some of the reasons for such common practice include non-

licensed providers of medicines, availability of prescription medicines in open markets, actions of unregistered practitioners, use of leftovers, medicines obtained from family members or friends with previous similar symptoms (4 – 6). There are also reports of increased and sometimes irrational use of OTC medicines in some developing countries (3 – 6). This practice is on the increase among the poor socio-economic status groups, because of several reasons which include lack of modern healthcare facilities in rural areas, difficulties of accessing these facilities in urban areas, non-availability of doctors, high cost of private medical care and deviation from daily schedule caused by waiting in long queues (4 – 6).

In developing countries, such as Papua New Guinea (PNG), self-medication may pose a threat to public health unless the population is adequately educated on responsible self-medications, so as to avoid problems associated with irrational medicine use.

PNG has a fair share of Health Service problems, with reports indicating that anti-malarial medicine resistance and resistance to some antibiotics are on the increase (7). This indicates the possibility of existing irrational use of these medicines, including their indiscriminate non-prescription use.

The Medicines and Cosmetic Act 1999 of PNG as amended in the Medicine and Cosmetics Regulations 2001; lists 1070 Prescription Only Medicines, 334 Pharmacy Only Medicines and 493 OTC medicines (8). There are no published data indicating awareness of the OCT and Pharmacy only medicines that are available for self-medication in PNG. In addition, there are no data to indicate the prevalence and factors associated with self-medication among the various communities in PNG. More specifically, there are not data on the pattern of self-medication among students in the various universities in PNG. This calls for appropriate research to establish the extent of self-medication in communities in PNG, so as to develop appropriate strategy to address the problems.

The University of Papua New Guinea (UPNG) is the premier university in PNG. There are five Schools, offering various degree programs in UPNG. The School of Medicine and Health Sciences (SMHS), located in the Taurama campus of UPNG, offers degree programs in Medicine, Pharmacy, Dentistry and other related medical courses. The other four Schools are located in the Waigani campus of UPNG.

The aim of this study was to assess the prevalence and factors associated with self-medication among students in the UPNG. The objective was to ascertain the types of medicines used; the sources of medicines and medicine information, and also the common symptoms for which the medicines were used for self-medication.

Methods

Collection of data for this descriptive cross-sectional study was conducted during the 2006 academic session, in the UPNG, which is one of the four major universities in PNG. The study population included all the 2160 full time undergraduate students, excluding all foundation year students. The duration of the UPNG academic session is 30 weeks.

A calculated total sample size of 550 students was obtained based on a design effect of two, a relative precision of 10%, confidence level (CL) of 95% and predicted non-response rate of 20%. As there was no available information on likely prevalence rate of self-medication in PNG, an assumed prevalence rate of 25% was used. The sample size for the two campuses was calculated using the “proportionate to population size” (PPS) cluster sampling technique.

The identification number (ID) for each of the 2160 full time students registered in the Taurama and Waigani campuses of the UPNG were obtained from the Executive Officers in each of the five schools. These numbers were further confirmed in the academic office in Waigani. The computer-generated random numbers were obtained and each number was randomly allocated to individual student using the ID numbers. The computer generated random numbers were used for selection the students to participate in the study. This was carried out using the standard procedures (9) as follows; the sample interval (k) was calculated and used as the starting point in the random number table. Each number selected randomly was then allocated to a questionnaire which also contains the ID number of a student. The final list obtained was then separated according to the ID numbers of the students, Taurama and Waigani campuses. Thus, a total of 620 full-time students, 124 (20%) on Taurama campus and 496 (80%) on Waigani campus were selected. This amounted to about 10% over sampling of the students on both campuses. The questionnaires were given to those students whose ID numbers were selected using the sample interval.

The purpose of the study was explained to each student before giving them a written consent form to read and sign. Questionnaire was given only to students that signed the consent form. To guarantee confidentiality, names were omitted from both the consent form and the questionnaire.

Self-administered, structured, pre-tested questionnaire was used to collect information on age, sex, type and reasons for medication, self-use of medication during the 2005 academic year, names and doses of self-prescribed medicines, duration of use, sources of the medicines, knowledge of OTC and prescription medicines, and reasons for not consulting a doctor. The questionnaire was pre-tested for content and designed using a different cohort of 50 students, selected randomly from both campuses.

Ethical clearance for the study was obtained from the School of Medicine and Health Sciences, UPNG Ethical and Research Grant Committee.

Data analysis was by Statistical Package for Social Sciences (SPSS-PC Software, Version 11). Chi square test was used to assess significance amongst variables. A p-value of < 0.05 was considered as significant. The data are presented for all the students as a group and for students on the Taurama campus and Waigani campus.

Results

A total of 620 students from UPNG were recruited for the study, of which 583 (94%) consented to participate by signing the consent form. The 37 (6%) students that did not sign were on the Waigani campus. Thus, a total of 583 questionnaires were distributed as follows, 124 (21.3%) among students on Taurama campus and 459 (78.7%) among students on Waigani campus. However, only 309 (53%) of the questionnaires received from all the students were suitable for analysis. Thus, the total consent rate, 309 of the 620 students recruited, was 49.8%. The age range of all the consented students was 19 – 49 years. Gender distribution of these students was 148 (47.9%) males mean age 23.6 ± 4 years, and 161 (52.1%) females, mean age 21.9 ± 2.1 years.

Further analysis of questionnaires from the 309 students indicated that 85 (27.5%), mean age 22.4 ± 2.4 , years were from Taurama campus and 224 (72.5%), mean age 22.8 ± 3.6 years, were from Waigani campus. Gender distribution of the students on Taurama campus was, 36 (42.4%) males with mean age 22.9 ± 3.2 years and 49 (57.6%) females with mean age 22.1 ± 1.5 years; on Waigani campus was 112 (50%) males, with mean age of 23.8 ± 4.2 years and 112 (50%) females, with mean age of 21.9 ± 2.3 years.

Of the 309 students, 253 (82%), mean age 22.7 ± 3.4 years, indicated that they had used self-medication during the 2005 academic year. Of these students, 90% (228) indicated regular use of self-medication, while 10% (25) occasionally self-medicated. Of the 253 students that self-medicated, the highest prevalence (84%) of self-medication was among the students in the 20 – 24 years age group, followed by students (9.5%) in the 25 – 29 years age group. Gender distribution of all the students that self-medicated was 117 (46%) males, mean age 23.6 ± 4.1 years, and 136 (54%) females, mean age 22.0 ± 2.2 years. This indicates that 79.1% of the male and 84.5% of the female students self-medicated. Thus, there was no statistically significant difference ($p > 0.05$) between the male and female students that self-medicated.

When the 253 students that self-medicated, were distributed according to campuses 30% (76) were on Taurama campus and 70% (177) on Waigani campus. This indicated that 89.4% and 79.0% of students on Taurama and Waigani campuses respectively self-medicated during the academic year. This difference was not statistically significant ($p > 0.05$).

The 253 students used various medicines for self-medication. Medicines were consumed in a total of 1112 instances, which gives an average medicine consumption rate of 4.4 instances per student during the 30 weeks duration of the 2005 academic Session.

The OTC and Prescription medicines were used in 63.8% (710) and 36.2% (402) respectively of the 1112 instances (Table 1). Paracetamol used in 423 (59.6%) instances was the most frequently used OTC medicines, followed by other non-steroidal antiinflammatory medicines (NSAIDs) used in 122 (17.2%) instances. Cough and cold remedies were used in 96 (15.5%) instances. The use of other OTC medicines, such as, antacids, heat-rub, lozenges and worm tablets was relatively low (69 instances, 9.7%). Gender distribution (Table 1) of the frequency of OTC medicines consumption pattern indicates that the female students consumed more (402 instances, 56.6%) than the male students (308 instances, 43.4%). This difference was however, not statistically significant ($p > 0.05$).

Further distribution (Table 1) of the 710 instances indicated that the students on Taurama and Waigani campuses consumed OTC medicines in 193 (27.2%) and 517 (72.8%) instances respectively. This gives an average medicine consumption rate of 2.5 and 2.9 instances per student in Taurama and Waigani campuses respectively. This difference was not statistically significant ($p > 0.05$). Paracetamol was the most frequently used OTC medicine among students on both campuses.

Of the 402 (36.2%) instances that all the students used prescription medicines, antibiotics were the most frequently used, 219 instances (54.5%), followed by Antimalarials used in 183 instances (45.5%). In the antibiotic group, Amoxicillin (196 instances, 89.5%) was the most frequently used, followed by Septrin (17 instances, 7.8%), Chloramphenicol (four instances, 1.8%) and Penicillin (two instances, 0.9%). In the antimalarial group, Chloroquine (87 instances, 47.5%) was the most frequently used, followed by Artemether (70 instances, 38.3%), Fansidar (22 instances, 12.0%), Quinine (two instances, 1.1%) and Primaquine (two instances, 1.1%). There was not significant difference ($p > 0.05$) in the frequency of usage of prescription medicines among the female (204 instances, 50.7%) students, compared to male (198 instances, 49.3%) students.

Analysis of the data indicated that of the total 1112 instances, the medicines were used appropriately in 931 (83.7%) instances compared to their inappropriate use in 181 (16.3%) instances by all the students. Of the 181 inappropriate instances, the OTC medicines were used inappropriately in 21 instances (11.6%) compared to 160 inappropriate instances (88.4%) for prescription medicines. Antibiotics and antimalarial medicines were used in 121

(75.6%) and 33 (20.6%) instances respectively of the 160 inappropriate instances of medicines used by all the students. Amoxicillin (101 instances, 83.5%) was the most frequently abused antibiotic, while Chloroquine (33 instances, 51.5%) was the most frequently abused antimalarial medicine. Inappropriate use of the medicines was higher among the male students (53.6%) compared to the female students (46.4%). The difference was however, not significant statistically.

Further analysis of the distribution of the 402 instances that prescription medicines were used indicates usage of 36.2% (132 instances) by students on Taurama campus compared to 270 instances (67.2%) by the students on Waigani campus, (Table 1). This is equivalent to an average drug consumption rate of 1.7 instances per student on Taurama campus compared to 1.5 instances per student on Waigani campus. This difference was not statistically significant ($p > 0.05$). In both campuses, Amoxicillin was the most frequently used antibiotic, whereas Chloroquine was the most frequently used antimalarial medicines. There was not significant difference in the inappropriate use of medicines by students on Taurama campus compared to those on Waigani campus.

Table 2 shows the prevailing conditions for which the students self-medicated. Headache and malaria were the two major reasons for self-medication among all the students in UPNG and on both campuses. In most cases, self-medication for headache was commenced as soon as the pain started. Dizziness was the prevailing symptom for the commencement of self-medication for malaria. Although, according to most of the students, malaria was usually associated with fever, the onset of fever associated with body ache or joint pain was not related to malaria. Self-medication for cough and skin infections was higher among students on Taurama campus, compared to those on Waigani campus.

Table 1: Medicines / Medicine groups used by students for self-medication

Medicines/ Medicine Groups	Instances (%) of usage in UPNG			Instances (%) of usage in UPNG Campuses	
	Total students	Females	Males	Taurama	Waigani
Over the counter Medicines (OTC)					
Paracetamol	423 (59.6%)	249 (61.9%)	174 (56.5%)	126 (65.3%)	297 (57.4%)
Other NSAIDs	122 (17.2%)	64 (15.9%)	58 (18.8%)	22 (11.4%)	100 (19.3%)
Cough & Cold remedies	96 (15.5%)	57 (14.2%)	39 (12.7%)	20 (10.4%)	76 (14.7%)
Others	69 (9.7%)	32 (8.0%)	37 (12.0%)	25 (13.0%)	44 (8.5%)
Total Instances	710.0	402.0	308.0	193	517
Prescription Medicines	Total	Females	Males	Taurama	Waigani
Antibiotics	219 (54.5%)	117 (57.4%)	102 (51.5%)	74 (56.1%)	145 (53.7%)
Antimalarials	183 (45.5%)	87 (42.6%)	96 (48.5%)	58 (43.9%)	125 (66.3%)
Total Instances	402.0	204.0	198.0	132.0	270.0

The students were asked to indicate all the sources from which they obtained the various medicines they had used to self-medicate. Friends (53.8%), pharmacy shops (52.6%) and supermarkets (43.1%) were the major sources of medicines used for self-medication by all the students. The students indicated that they had visited pharmacy shops 133 times during the academic session. Pharmacists were present during 47% of the times they visited pharmacy

shops. Pharmacists were not present in any of the supermarkets during the time of their visits. Although this trend was similar for students on both campuses, the use of leftover medicines from previous visits to clinics was more prevalent among students (41.2%) on the Waigani campus, compared to 17.1% of students on the Taurama campus.

The students obtained information about the medicines used for self-medication from multiple sources. Most (65%) of the students indicated that the labels on packets and leaflets inside packets were the major sources of information about the medicines used to self-medicate. Previous prescriptions (54.5%), friends (37.2%), relatives (28.1%) and News media (13%) were the other sources of information. This trend was similar for students on both campuses.

When asked about the knowledge of side effects of some of the medicines that they used to self-medicate, 55.7% of the students had some knowledge of the side effects of some of the medicines, compared to 44.3% that had no knowledge of any side effects of any of the medicines. When distributed according to gender, 56.4% and 55.9% of male and female students respectively had some knowledge of the side effects of some of the medicines.

Table 2: Conditions for which students self-medicated *

Conditions	UPNG			UPNG Campuses	
	Males (n = 117)	Females (n = 136)	Total (n = 253)	Taurama (n = 76)	Waigani (n = 177)
Headache	92.3% (108)	92% (125)	92.1% (233)	92.1% (70)	92.1% (163)
Malaria	71% (83)	76.5% (104)	74% (187)	72.4% (55)	74.6% (132)
Cough	41% (48)	49.3% (67)	45.5% (115)	61.8% (47)	38.4% (68)
Fever	43.6% (51)	36.8% (50)	40% (101)	46.1% (35)	37.3% (66)
Flu	34.2% (40)	39.7% (54)	37.2% (94)	28.9% (22)	40.7% (72)
Running nose	22.2% (26)	28.7% (39)	25.7% (65)	18.4% (14)	28.8% (51)
Back ache	31.6% (37)	19.1% (26)	24.9% (63)	11.8% (9)	30.5% (54)
Stomach ache	17.9% (21)	27.2% (37)	23% (58)	18.4% (14)	24.9% (44)
Sore throat	23.1% (27)	22.1% (30)	22.5% (57)	22.4% (17)	24.9% (44)
Ear ache	8.5% (10)	14.7% (20)	11.9% (30)	6.6% (5)	14.1% (25)
Skin infections	15.4% (18)	7.4% (10)	11.1% (28)	15.8% (12)	9% (16)
Diarrhoea	4.3% (5)	4.4% (6)	4.3% (11)	6.6% (5)	3.4% (6)
Vomiting	2.6% (3)	2.2% (3)	2.4% (6)	2.6% (2)	2.3% (4)
Others	24.8% (29)	25.7% (35)	25.3% (64)	23.7% (18)	26% (46)

* Figures indicate multiple responses; Total does not add up to 100%

A total of 75% and 47.5% of students on Taurama and Waigani campuses respectively, indicated that they had some knowledge of the side effects of some of the medicines that they used to self-medicate. Thus, 25% of the students in Taurama campus were not aware of any side effects of the medicines used to self-medicate compared to 52.5% of the students on the Waigani campus.

Table 3: Reasons for self-medication among the students *

	UPNG			UPNG Campuses	
	Males (n = 117)	Females (n = 136)	Total (n = 253)	Taurama (n = 76)	Waigani (n = 177)
Previous experience of treatment in relation to symptoms	79.5% (93)	68.4% (93)	73.5% (186)	81.6% (62)	70% (124)
Mild illness	67.5% (79)	64.7% (88)	66% (167)	84.2% (64)	58.2% (103)
Long queues to doctors	27.4% (32)	25.7% (35)	26.5% (67)	17.1% (13)	30.5% (54)
Expensive seeing the doctors	18.8% (22)	8.8% (12)	13.4% (34)	5.3% (4)	17% (30)
No time to visit clinics because of lectures	18.8% (22)	14.7% (20)	16.6% (42)	15.8% (12)	17% (30)

* Figures indicate multiple responses; Total does not add up to 100%

The reasons for self-medication among all the students and students on each campus are presented in Table 3. Previous experience of treatment in relation to symptoms (73.5%) and mild illness (66.0%) were two of the major reasons for self-medication among all the students. The trend was similar among both male and female students. Mild illness was the major prevailing reason for self-medication among 84.2% of students on Taurama campus, compared to 58.2% of students on Waigani campus. On the Waigani campus 30.5% of students self-medicated because of long queues to doctors compared to 17.1% of students on the Taurama campus. It was more expensive for students on Waigani campus to see the doctors compared to students on Taurama campus.

Discussion

The high (50.2%) total non-response rate obtained in this study highlights the already reported common problems in conducting surveys by questionnaires (2-4). The non-response rate of 54.8% (272 students) was higher on Waigani campus compared to 31.5% (39 students) on Taurama campus. Reasons for the high non-response rate include failure to complete and return the questionnaire despite several attempts made to contact some of the students, incomplete questionnaires and difficulty in remembering the names of medicines, dosage and duration of use. This supports the observation (2-4) that problems in recalling retrospective information, such as types of medicines used and understanding the meaning of self-medication are major contributing factors to the low response rate from some consented participants. Although the total number of female students was slightly higher than that of male students, the difference was not statistically significant. There was no significant difference in the mean age of students that self-medicated on both campuses.

The 82% prevalence of self-medication amongst the students in UPNG was lower than the 94% and 88% reported among university students in Hong Kong (3) and Croatia (11) respectively, but higher than the 45% and 76% reported amongst university students in Turkey (10) and Karachi (6) respectively.

No statistically significant differences were observed in the mean ages and self-medication practices among the male and female students in UPNG. This finding was similar to that reported by some authors (3, 6, 12), but different from that of others (3, 4, 5, 13), who

reported significant differences in self-medication practices between male and female respondents.

The relatively higher but non-significant prevalence of self-medication practice among the students (89.4%) on Taurama campus compared to students (79.0%) on Waigani campus was similar to the data reported for medical and non-medical students in Karachi (6) and Sudan (13). Our data do not strongly favour the idea that students in the medical sciences tend to self-medicate more than other students (6). However, the set up and location of the two campuses in UPNG makes it difficult to explain the reason for the high prevalence of self-medication practices among students in the Taurama campus. This is because there is only one clinic for staff and student on the Waigani campus, compared to the Taurama campus, which, apart from having a clinic for students, is located in close proximity to the PMGH. In addition, students on Taurama campus have easy access to their teachers; some of them are qualified medical doctors, pharmacists, dentists and nurses. Most of these staff members offer free consultations to students without prior appointment. Despite this easy access the prevalence of self-medication was 89.4% among the students on Taurama campus. It seems plausible that the students in Taurama and Waigani campuses may not be fully aware of some of the implications of indulging in self-medication. There is therefore an urgent need to carry out intensive education, information and awareness campaign to advocate for reduction in the prevalence of self-medication among students on both campuses in UPNG.

Paracetamol and other NSAIDs were the most frequently used OTC medicines for self-medication among the students in UPNG and on both campuses. This corresponds to the findings that headache was the commonest prevailing illness for self-medication among the students. This is similar to reports on university students by other authors (2 – 6). Panadol, the most frequently used OTC medicine for self-medication, is a Paracetamol-based analgesic that is known to provide fast, effective temporary relief of pain and discomfort associated with headache, tension headache, migraine headache, muscle pain, backache, toothache, period pain, cold and flu symptoms (9). Panadol is a much safer medicine to use than Aspirin (9). It is the analgesic of choice for individuals with a sensitive stomach, and stomach ulcers (9). The various brands of Panadol available in Port Moresby are sold as OTC medicines (9). There was no statistically significant difference between the frequency of usage of Panadol by students in Waigani and Taurama campuses.

The calculated frequency (545 instances by all the 253 students) of use of paracetamol and other NSAIDs is equivalent to 2.2 instances per student over the duration of the academic year. This frequency is higher than the values reported by other authors (3,4). This should be of concern because the abuse of OTC medications may produce unwarranted medical complications or interact with prescription medications. Thus, the need to educate the students on the appropriate use of the OTC medications cannot be overemphasized. The lack of awareness of the “hidden” ingredients in some OTC medicines may exacerbate existing medical problems in susceptible individuals (9).

The high frequency with which antibiotics and anti-malarial medicines were used for self-medication is a controversial issue that must be addressed because of the possibility of developing drug resistance, if the medicines are not properly used. Inappropriate use of antibacterial and antimalarial medicines, such as inadequate dosing, incomplete courses and indiscriminate usage, are the major contributing factors to the development and spread of drug resistance, particularly in developing countries (2,6).

Port Moresby is not an endemic zone for malaria, thus the indiscriminate use of anti-malaria medicines must be discouraged. It is therefore necessary to conduct regular advocacy on the potential benefits and risks associated with the use of Artemether and Artesunate, which are

the currently available anti-malarial medicines in PNG and other developing countries. Prevalence of self-medication for diarrhoea and vomiting was very low, because most of the students consider these to indicate serious illness, which calls for a visit to the doctor. Those that self-medicated indicated that they use commercially available oral rehydration solution, coconut water or rice water.

Friends, relatives and medicine retail shops are responsible for promoting self-medication among the students. The high percentage of students from Waigani campus that used leftover medicines from previous visits to the clinic indicates that either they had not taken the prescribed dose of the medication or that too much medication had been prescribed. The presence of pharmacists in all medicine retail outlets can play a significant role in controlling some of the factors that promote self-medication. The non-availability of pharmacists in most medicine retail outlets to give professional advice on the use of OTC medicines and to restrict the sale of prescription only medicines is a major issue that requires immediate attention by the health authorities in Port Moresby. Consumers of OTC medicines require proper access to accurate and clear information on the uses of these medicines. It is therefore important to ensure that all medicine labels and leaflets inside packets are written in simple English and in the local Tok Pisin language commonly spoken by people in PNG.

Comprehensive information on the side effects of OTC medicines should be included on information leaflets in the packets of medicines. In addition, intervention, such as distribution of information about side effects of OTC medicines should be carried out via media, health education sessions, posters and education councillors on the UPNG campuses. The current UNPG foundation year course on Drug Abuse and Misuse should include the effective use of self-medication.

There was no significant difference in the prevailing reasons for self-medication among all the students in UPNG. However, self-medication in the treatment of mild illness was higher among students on Taurama campus compared to students in Waigani campus. This indicates that students on Taurama campus are more aware of the concept of self-medication, as visiting the doctor is unnecessary for mild illnesses. On the other hand, using self-medication because of previous symptoms indicates insufficient knowledge of the concept of self-medication. In order to correct and consolidate the prevailing self-medication practices among the students on Taurama campus, it is important that students get a clear understanding of the concept of mild illness and learns about the appropriate medicines that should be used in these cases. Experts in the field of drug education and self-care practices should conduct intensive advocacy and education of proper self-medication practices among the general student population in UPNG. Increasing the number of doctors in the student clinic on Waigani campus can shorten the queues to doctors, thus encouraging more students to refrain from self-medication.

Conclusion

The prevalence of self-medication is high (82%) among students in the University of Papua New Guinea, with no significant difference between male and female students. There was no significant difference observed in the self-medication practices among the students on the Taurama and Waigani campuses.

Paracetamol and other NSAIDs were the most frequently used OTC medicines for self-medication. Amoxicillin was the most frequently used antibiotic, while Chloroquine was the most frequently used antimalarial medicine. Inappropriate use of medicines was higher among the male students (53.6%) compared to the female students (46.4%) in UPNG. Headache and malaria were the two major reasons for self-medication. Friends, relatives and

medicine retail shops were responsible for promoting self-medication among the students. The presence of pharmacists in all medicine retail outlets can play a significant role in controlling some of the factors that promote self-medication among the students.

There is need to carry out intensive education and comprehensive awareness campaign to advocate for reduction in the prevalence of self-medication among students on the Taurama and Waigani campuses in the University of Papua New Guinea.

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References

1. Responsible self-medication: Joint statement by The International Pharmaceutical Federation and The World Self-Medication Industry (WSMI). International Pharmaceutical Federation (FIP); June 1999; 1 – 3.
2. Abdelmoniem A, Eltayeb I, Matowe L, Thalib L. (2005) Self-medication with Antibiotics and Antimalarials in the community of Khartoum State, Sudan. *J. Pharmaceut Sci.* 8 (2): 326 – 331.
3. Lau GSN, Lee KKC, Luk CT. (1995) Self-Medication among University Students in Hong Kong. *Asia Pac J Public Health*; 8 (3): 153 – 157.
4. Shankar PR, Partha P and Shenoy N. (2002) Self-medication and non-doctor prescription practices in Pokhara valley, Western Nepal: a questionnaire-based study. *Bio Med Central Family Practice*; 3: 17 – 23.
5. Buck ML. (2007) Self-medication by adolescents. *Pediatr Pharm.* 13 (5): 1 – 4.
6. Zafar SN, Syed R, Waqar S, Zubairi AJ, Vaqar T, Shaikh M, Yousaf W, Shahid S, Saleem S. (2008) Self-medication amongst university students in Karachi: Prevalence, Knowledge and Attitudes. *J. Pak Med Assoc.* 58 (4): 214 – 217.
7. Joint Malaria Meeting 2004, Report. Edited by: ICRMC UPNG and Tokyo Women's Medical University. 7th to 9th June 2004, Port Moresby, NCD, PNG.
8. Hulley SB, Cummings SR, Browner WS, Grady D, Hearst N, Newman TB (2001): Choosing the study subjects: Specification, Sampling and Recruitment. In: *Designing Clinical Research: An Epidemiologic Approach*, 2nd Edition, Lippincott Williams & Wilkins, NY, pp 25 – 36.
9. Medicines and Cosmetics Regulation, Papua New Guinea, National Department of Health, Port Moresby. 2001: Sect 8; 57 – 98.
10. Buke C, Limoncu M, Ermevtcan S, Cicekliogu M, Tuncel M, Kose T. (2005) Irrational use of antibiotics among university students. *J. Infect*; 51: 135 – 139.
11. Vucic VA, Trkulja V, Lackovic Z. (2005) Content of home pharmacies and self-medication practices in households of pharmacy and medical students in Zagreb, Croatia: findings in 2001 with a reference to 1977. *Croat Med J.* 46: 74 – 80.
12. James H, Handu SS, Al Khaja KAJ, Otoom S, Sequeira RP. (2006) Evaluation of the knowledge, attitude and practice of self-medication among first-year medical students. *Med Princ Pract.* 15: 270 – 275.
13. Awad AI, Eltayeb IB. (2007) Self-medication practices with antibiotics and antimalarials among Sudanese undergraduate university students. *The Annals of Pharmacotherapy.* Vol. 41, No. 7, 1249 – 1255.