



## Original Article

## Self-Medication and Associated Factors among Nursing Student Trainees at Ngozi Hospital-Burundi

*Automédication et facteurs associés chez les infirmiers stagiaires à l'Hôpital de Ngozi - Burundi*

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### ABSTRACT

**Background.** Self-medication refers to self-prescription, which includes diagnosing and treating one's own illness and prescribing for one's self. Studies show that prevalence rates range from 38% to 97.8% depending on the students' country of origin and graduation course. The aim of this study was to determine prevalence and associated factors of Self-medication among nursing student trainees at Ngozi Hospital-Burundi. **Materials and Methods.** A descriptive cross sectional study was conducted among 384 nursing student trainees at Ngozi Hospital. Data were analyzed by Stata software version 16. **Results.** The prevalence of self-medication was 58.07% (CI 95%: 53.07- 63.07). The mean age was 26.16±2.81 years. Among all the study participants 66.67% were from the third year of university nursing student, 3.91% were nursing paramedical pupils. The main reasons for self-medicating in the last three months were the belief that they had knowledge (41.61%), minor health problem (22.36%). Self-medication was influenced by relative advices (13.66%) and low income (10.56%). Different categories of medicine used were paracetamol (58.39%), antibiotics (16.77%), ibuprofen (8.07%) and other drugs (11.8%). On multivariate analysis, factors associated with self-medication were, level of study (OR= 3.48; 95% CI: 2.89–6.40; p<0.0001), and protestant religion (OR=3.88, 95% CI: 2.21–6.85; p<0.0001). **Conclusion.** Our results underline the need for enhancing the education of nursing students regarding the rational use of medicine.

### RÉSUMÉ

**Introduction.** L'automédication fait référence à l'auto-prescription, qui comprend le diagnostic et le traitement de sa propre maladie. Les études montrent que la prévalence varie de 38% à 97,8 % en fonction du pays d'origine des étudiants et de leur cursus. L'objectif de cette étude était de déterminer la prévalence et les facteurs associés de l'automédication chez les étudiants stagiaires en soins infirmiers à l'hôpital de Ngozi-Burundi. **Matériels et Méthodes.** Une étude descriptive transversale a été menée auprès de 384 étudiants stagiaires en soins infirmiers à l'hôpital de Ngozi. L'ensemble des analyses a été réalisé à l'aide du logiciel Stata 16. **Résultats.** La prévalence de l'automédication était de 58,07% (IC 95% : 53,07- 63,07) avec un âge moyen de 26,16±2,81 ans. La majorité des participants (66,67%) était en troisième année d'études universitaires. Les principales raisons de l'automédication étaient : avoir des connaissances (41,61%) et un problème de santé mineur (22,36%). L'automédication était influencée par les conseils de la famille (13,66%) et les faibles revenus (10,56%). Les médicaments utilisés étaient le paracétamol (58,39%), les antibiotiques (16,77%), l'ibuprofène (8,07%) et les autres médicaments (11,8%). En analyse multivariée, les facteurs associés à l'automédication étaient, le niveau d'étude (OR= 3,48 ; IC 95% : 2,89-6,40 ; p<0,0001), et la religion protestante (OR=3,88, IC 95%:2,21-6,85; p<0,0001). **Conclusion.** Nos résultats soulignent la nécessité d'améliorer la formation des étudiants en soins infirmiers concernant l'utilisation rationnelle des médicaments.

### INTRODUCTION

Self-medication is practiced worldwide(1,2) and the incidence may be higher in developing countries(3). It refers to self-prescription which includes diagnosing and treating one's own illness and prescribing for one's self(4). Self-medication can help in prevention and treatment of diseases that do not require medical consultation and provides a cheaper alternative for treating common illnesses(5). Nevertheless, this practice

can cause inappropriate antimicrobial resistance, adverse reactions to drugs, drug interactions, the risk of masking evolutionary diseases, and increase costs for the health system(2). Previous studies identified that motivations for self-medication include prior experience with the symptom or disease, the belief that one has knowledge of the disease, limited financial resources to appropriate treat a health problem, lack of time to seek medical assistance, and personal attitude regarding the disease(6–8). Due to the epidemiological magnitude and negative impact of this

practice, self-medication among nursing students in the area of healthcare is considered as important public health problem. Studies show that prevalence rates range from 38.0% to 97.8%, depending on the students' country of origin, graduation course, or the reminiscent period of self-medication(9–11).

In Burundi, the magnitude of the phenomenon is unknown. Self-medication among nursing student trainees may be more because they are empowered with educational level, access to medicine and information, knowledge of diseases. In addition, the limited resources, the influence of the culture on the habits of the population, unlimited access to medicines in private pharmacies are very specific aspects that can influence the decision to self-medicate among future paramedics.

In this regard, considering the different factors involved in self-medication, we wanted to answer the following question: What is the prevalence and associated factors of self-medication among nursing student trainees at Ngozi Hospital-Burundi?

Thus, the aim of this study was to determine prevalence and associated factors of Self-medication among nursing student trainees at Ngozi Hospital-Burundi.

## MATERIALS AND METHODS

A descriptive cross-sectional survey was carried out among nursing student trainees at Ngozi hospital.

A sampling was done and minimum sample size was calculated as

$$n = z^2 \times (p \times q) / e^2 = 1.96 \times (0.5 \times 0.5) / 0.05^2 = 384$$

*n* = minimum sample size, *z* = confidence interval at 95% *z*: 1.96, *p* = prevalence of self-medication taken as 50%, *q* = 1-*p*, *e* = margin of error 5%.

The study was conducted among 384 nursing student trainees at Ngozi Hospital from third and fourth for nursing paramedical pupils and from second to third year for university nursing student.

The inclusion criteria were nursing student trainees at Ngozi Hospital from third and fourth for nursing paramedical pupils and from second to third year for university nursing student present at Ngozi Hospital during our survey who willing to fill the questionnaire. Selected students were segregated in hall and requested to sit separately. They were made clear about details of questionnaire and asked for clarification of any confusion they had. The questionnaire was in two parts. The first part contained questions on demographic information of the respondents such as age, gender, level of study, marital status, religion and lifestyle. Socioeconomic variables such as health seeking behavior, names and sources of drugs used for self-medication, type of illness, factors influencing self-medication practices and medical's insurance system use were covered in second part of questionnaire.

### Ethical consideration

The institutional Ethics Research Committee approved this study, and formal consent was obtained from all participants.

## Data analysis

Data forms were checked, validated, coded, entered into the computer, and compared for quality control. Data were analysed using Stata 16 software packages (version 16.0, College Station, TX). Qualitative variables were described using frequencies and percentages. Chi-square tests or Fisher's exact test were used to compare proportions between groups and quantitative variables as mean  $\pm$  standard deviation (SD). In order to determine independent risk factors associated with self-medication, a multivariate logistic regression model with included backward stepwise procedure was performed. Variables included in the first multivariate model were those with a *p*-value  $\leq 0.25$  in the univariate model. The level of significance for all the statistical analyses was set at 0.05.

## RESULTS

We found that 55.99 % of the nursing students were female while male nursing students were 44.01%. Among all the study participants, 66.67% were from the third year of university nursing student, 3.91 were nursing paramedical pupils. The prevalence of self-medication was 58.07 %. Among study sample, 55, 47 % were catholic and 39.06 % lived in colocation.

**Table 1: Demographic characteristics of respondents**

Variables	Frequency	%	
Sex	Male	169	44.01
	Female	215	55.99
Level of study	University nursing student year 2	113	29,43
	University nursing student year 3	256	66,67
	Paramedical nursing pupils last year	15	3,91
	None	329	85,69
Medical insurance use	Public service insurance	26	6,77
	Medical assistance card	15	3,91
	Others	14	3,65
Lifestyle	With parents	53	13,8
	Alone	71	18,49
	Co-location	150	39,06
	In family	102	26,56
Marital status	Others	8	2,08
	Single	336	87,5
Self-medication	Married	48	12,5
	No	161	41,93
Religion	Yes	223	58,07
	Catholics	213	55,47
	Protestant	127	33,07
	Muslim	26	6,77
	Others	18	4,69

The average age in the self-medication group was  $30.61 \pm 6.56$  years, and for those who did not self-medicate,  $25.65 \pm 7.24$  years. There was statistically significant difference between the groups of age

( $p=0.0016$ ), the level of study ( $p=0.007$ ), medical insurance ( $p<0.0001$ ) the life style ( $p=0.005$ ) and religion ( $p<0.0001$ ) as shown in Table 2.

**Table 2: Self-medication among nursing student trainees at Ngozi Hospital-Burundi according to socio-economic variables**

Variable	Self-medication						p
	Total		No		yes		
	n=384	%	n=161	%	n=223	%	
<b>Age</b>	26.16±2.81*		25,65±7,24		30,61±6,56		<b>0.0016</b>
<b>Sex</b>							<b>0.102</b>
Male	169	44,01	63	39,13	106	47,53	
Female	215	55,99	98	60,87	117	52,47	
<b>Level of study</b>							<b>0.007</b>
University nursing student year 2	113	29,43	37	22,98	76	34,08	
University nursing student year 3	256	66,67	121	75,16	135	60,54	
Paramedical nursing pupils last year	15	3,91	3	1,86	12	5,38	
<b>Medical insurance use</b>							<b>&lt;0.0001</b>
None	329	85,69	126	78,25	203	91,03	
MFP	26	6,77	14	8,7	12	5,38	
CAM	15	3,91	7	4,35	8	3,59	
Others	14	3,65	14	8,7	0	0	
<b>Lifestyle</b>							<b>0.005</b>
With parents	53	13,8	27	16,77	26	11,66	
Alone	71	18,49	32	19,88	39	17,49	
<b>Co-location</b>	150	39,06	71	44,1	79	35,43	
In family	102	26,56	27	16,77	75	33,63	
Others	8	2,08	4	2,48	4	1,79	
<b>Marital status</b>							<b>0.127</b>
Single	336	87,5	136	84,47	200	89,69	
Married	48	12,5	25	15,53	23	10,31	
<b>Religion</b>							<b>&lt;0.0001</b>
Catholics	213	55,47	64	39,75	149	66,82	
Protestant	127	33,07	72	44,72	55	24,66	
Muslim	26	6,77	15	9,32	11	4,93	
Others	18	4,69	10	6,21	8	3,59	

With regard to the health problems that led to self-medication, 60.87% of participants reported headache, (8.9%) and other symptoms (11.8%). The main reasons for self-medicating in the last three months were the belief that they had knowledge (41.61%), minor health problem (22.36%). Self-medication, according to the participants, was influenced by relatives' advices (13.66%) and low income (10.56%). Different categories of medicine, which were self-medicated by the participants for the treatment of ailments, were paracetamol (58.39%), antibiotics (16.77%), ibuprofen (8.07%) and other drugs (11.8%).

**Table 3. Purpose of practicing self-medication of the respondents.**

Variable	Frequency	(%)	
Types of drugs	Paracetamol	94	58,39
	Ibuprofen	13	8,07
	Antibiotics	27	16,77
	Antiparasitics	8	4,97
	Others	19	11,8

**Table 3 (suite): Purpose of practicing self-medication of the respondents.**

Variable	Frequency	(%)	
Reasons and origin drugs	I have knowledge	67	41,61
	Low income	17	10,56
	Minor health problem	36	22,36
	Luck of time	5	3,11
	Previous prescription	3	1,86
	Stored at home	4	2,48
	Given by relatives	3	1,86
	Pharmacist advice	4	2,48
	Relatives advice	22	13,66
Kind of illness	Headache	98	60,87
	Fever	10	6,21
	Tiredness	10	6,21
	Infection	3	1,86
	Cold	14	8,9
	Gastritis	3	1,86
	Diarrhea	4	2,48
	Others	19	11,8

All variables that were significantly associated with self-medication at 5% level of significance by bivariate analysis were retained for multivariable analysis. The backward stepwise regression was employed and after adjustment, two variables remained significantly associated with self-medication. The level of study as third year of university nursing student was statistically significant (AOR =3.48 CI 95% [2.89-6.40];  $p < 0.0001$ ) and protestant religion (AOR=3.88 CI 95% [2.21-6.85];  $p < 0.0001$ ).

**Table 4: factors associated with self-medication**

Variables	Univariate analysis			Multivariate analysis		
	Odds ratio	CI 95%	p	odds ratio	CI 95%	P-Value
Age	1,12	[1,04-1,20]	<b>0,002</b>	0,82	[0,74-0,91]	0,082
Sex						
Female	1			1		
Male	0,7	[0,47-1,07]	0,102	1,29	[0,70-2,3]	1,29
Marital status						
Single	1					
Married	0,62	[0,34-1,14]	0,13	0,6	[0,09-3,92]	0,602
Level of study						
Student trainees Bac2	1			1		
Student trainees Bac3	<b>0,54</b>	<b>[0,34-0,86]</b>	<b>0,1</b>	<b>3,48</b>	<b>[0,89-6,40]</b>	<b>&lt;0,001</b>
Paramedical pupils last year	<b>1,94</b>	<b>[0,51-7,32]</b>	<b>0,32</b>			
Medical insurance use						
None	1			1		
Public service insurance	0,53	[0,23-1,18]	0,12	1,1	[0,34-3,51]	0,98
Medical assistance card	0,7	[0,25-2,003]	0,51			
Others						
Lifestyle						
With parents	1			1		
Alone	1,26	[0,62-2,58]	0,51	1,39	[0,54-3,58]	1,39
Co-location	1,55	[0,62-2,16]	0,65	2,31	[1,04-5,12]	2,31
In family	2,88	[1,43-5,78]	0,003	0,46	[0,96-1,11]	0,46
Others	1,03	[0,23-4,59]	<b>0,96</b>			
Religion						
Catholics	1			1		
Protestant	0,32	[0,20-0,51]	<b>&lt;0,0001</b>	3,88	[2,21-6,85]	<b>&lt;0,0001</b>
Muslim	0,32	[0,13-0,72]	<b>0,006</b>	5	[1,74-14,63]	0,88
Others	0,34	[0,12-0,91]	<b>0,032</b>	2,14	[0,66-6,93]	0,66

## DISCUSSION

The present study depicts the prevalence and associated factors of Self-medication among nursing student trainees

at NGOZI Hospital-BURUNDI. The percentage of self-medication was 58.07 %. Our results are similar as a review article published in 2011, findings stated that in



76% of studies conducted on self-medication, the prevalence of such cases was reported over 50% of the population (12). Furthermore, a research among Indian population done in 2014 indicated that the prevalence of self-medication in deprived areas was about 56% (13). In our study, level of education was evaluated as a factor affecting self-medication (AOR =3.48 CI 95% (2.89-6.40);  $p < 0.0001$ ). Third year of university nursing student trainees were auto medicated. A study conducted by Aminshokravi et al in 2014 showed that the highest prevalence of self-medication was among those with diploma degree (14). Final year students had practiced self-medication more than second year because they might be aware about responsible self-medication and the diseases during the clinical postings. Similarly, final year students might felt themselves in near to qualified prescriber (15). Our study found that the female students (52.47%) practiced self-medication more than male (47.53%) which is similar to the findings of Lukovic et al. in their study in Serbia (7). They thought that it might be due to the perception of female towards drugs and their hesitancy in consulting doctors for the illness (16). This study revealed that indications for self-medication were minor illnesses, fever, headache, tiredness, infection, cold, gastritis, and diarrhea. Other studies also reportedly similar problems (17–19).

Antipyretics, antibiotics and analgesics were the most commonly self-medicated drug categories. The second most consumed medicine was antibiotics. Our findings are corroborated by research conducted with students from some universities in Africa and Asia (10,11,20). In Burundi, the limited inspection capacity and the tenacity of pharmaceutical companies in the sale of antibiotics limits any effective regulation. Antibiotics are possibly being sold in pharmacies without a prescription. The situation is similar on other countries (11,21).

The misuse of antibiotics can lead to the development of resistant bacteria. Moreover, self-medication with this group of drugs is usually absolutely inadequate, especially when indicated by layman or reusing old prescriptions, increasing the risk of adverse reactions (22).

The left-over drugs, previous prescriptions, friends, private pharmacies, relatives and knowledge formed the major source of drugs used for self-medication in this study. In Ngozi city, there are many private pharmacies shops and nursing student have easy accessibility and availability of drugs which facilitate them to practice self-medication. Previous studies showed that vicinity of private pharmacies and accessibility on drugs influence self-medication (23). In our study, religion (protestant) was associated with self-medication (AOR =3.88 CI 95% [2.21-6.85];  $p < 0.0001$ ). We do not find any other study related to association between religion and self-medication.

### Limitations

The limitation of this study included that the study involved a smaller number of students and only from one hospital which might not be representative for all nursing student trainees. If we had conducted the study in more hospitals, we would have got a more extensive scenario on the self-medication practice among nursing students'

trainees. Although, the selection of the subjects of participants was voluntary. Some students who self-medicate may not have participated.

### CONCLUSION

The present study highlights a high prevalence of self-medication among nursing student trainees at Ngozi Hospital-Burundi. In this respect, the study underlines the need for enhancing the education of nursing students regarding the rational use of medicine. Future studies in the same setting would enable to assess the prevalence and associated factors of Self-medication among nursing students.

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### Conflicts of interest

Authors declared they have no conflicts of interest

### REFERENCES

1. WHO. Guidelines for the regulatory assessment of medicinal products for use in self-medication. World Health Organization; 2000.
2. WHO. The Role of the pharmacist in self-care and self-medication : report of the 4th WHO Consultative Group on the Role of the Pharmacist, The Hague, The Netherlands, 26-28 August 1998 | Geneva; World Health Organization; 1998. (WHO/DAP/98.13). | WHOLIS [Internet]. 1998 [cited 2021 Mar 27]. Available from: <https://pesquisa.bvsalud.org/portal/resource/pt/who-65860>
3. Shankar PR, Partha P, Shenoy N. Self-medication and non-doctor prescription practices in Pokhara valley, Western Nepal: a questionnaire-based study. BMC family practice. 2002;3(1):1–7.
4. Gyawali S, Shankar PR, Poudel PP, Saha A. Knowledge, Attitude and Practice of Self-Medication Among Basic Science Undergraduate Medical Students in a Medical School in Western Nepal. Journal of Clinical and Diagnostic Research : JCDR. 2015 Dec;9(12):FC17.
5. Klemenc-Ketiš Z, Hladnik Ž, Kersnik J. A cross sectional study of sex differences in self-medication practices among university students in Slovenia. Collegium antropologicum. 2011;35(2):329–334.
6. Hussain A, Khanum A. Self medication among university students of Islamabad, Pakistan-a preliminary study. Southern Med Review. 2008;1(1):14–16.
7. Lukovic JA, Miletic V, Pekmezovic T, Trajkovic G, Ratkovic N, Aleksic D, et al. Self-medication practices and risk factors for self-medication among medical students in Belgrade, Serbia. PloS one. 2014;9(12):e114644.
8. Thadani S, Salman MT, Ahmad A. Knowledge attitude and practice of self-medication among second year undergraduate medical students. J Ration Pharmacother Res. 2013;1(3):131–4.
9. Al-Hussaini M, Mustafa S, Ali S. Self-medication among undergraduate medical students in Kuwait with reference to the role of the pharmacist. Journal of research in pharmacy practice. 2014;3(1):23.
10. Ehigiator O, Azodo CC, Ehizele AO, Ezeja EB, Ehigiator L, Madukwe IU. Self-medication practices among dental, midwifery and nursing students. European Journal of General Dentistry. 2013;2(1):54.
11. Kumar N, Kanchan T, Unnikrishnan B, Rekha T, Mithra P, Kulkarni V, et al. Perceptions and practices of self-

- medication among medical students in coastal South India. *PloS one*. 2013;8(8):e72247.
12. Montgomery AJ, Bradley C, Rochfort A, Panagopoulou E. A review of self-medication in physicians and medical students. *Occupational medicine*. 2011;61(7):490–497.
  13. Gupta P, Bobhate PS, Shrivastava SR. Determinants of self-medication practices in an urban slum community. *Asian J Pharm Clin Res*. 2011;4(3):54–7.
  14. Aminshokravi F, Tavafian S, Moayeri A. Assessing related factors on the illicit use of medications in Abbas Abad City (Mazandaran): A cross sectional study. *scientific journal of ilam university of medical sciences*. 2014;22(5):11–19.
  15. Pandya RN, Jhaveri KS, Vyas FI, Patel VJ. Prevalence, pattern and perceptions of self-medication in medical students. *Int J Basic Clin Pharmacol*. 2013;2(3):275–280.
  16. Chew-Graham CA, Rogers A, Yassin N. 'I wouldn't want it on my CV or their records': medical students' experiences of help-seeking for mental health problems. *Medical education*. 2003;37(10):873–880.
  17. Badiger S, Kundapur R, Jain A, Kumar A, Pattanshetty S, Thakolkaran N, et al. Self-medication patterns among medical students in South India. *The Australasian medical journal*. 2012;5(4):217.
  18. Banerjee I, Bhadury T. Self-medication practice among undergraduate medical students in a tertiary care medical college, West Bengal. *Journal of postgraduate medicine*. 2012;58(2):127.
  19. Sontakke SD, Bajait CS, Pimpalkhute SA, Jaiswal KM, Jaiswal SR. Comparative study of evaluation of self-medication practices in first and third year medical students. *Int J Biol Med Res*. 2011;2(2):561–564.
  20. Gama ASM, Secoli SR. Self-medication among nursing students in the state of Amazonas–Brazil. *Rev Gaúcha Enferm*. 2017;38(1):e65111.
  21. Akinyandenu O, Akinyandenu A. Irrational use and non-prescription sale of antibiotics in Nigeria, a need for change. *J Sci Innov Res*. 2014;3(2):251–7.
  22. Morgan DJ, Okeke IN, Laxminarayan R, Perencevich EN, Weisenberg S. Non-prescription antimicrobial use worldwide: a systematic review. *The Lancet infectious diseases*. 2011;11(9):692–701.
  23. Patil SB, Vardhamane SH, Patil BV, Santoshkumar J, Binjawadgi AS, Kanaki AR. Self-medication practice and perceptions among undergraduate medical students: a cross-sectional study. *Journal of clinical and diagnostic research: JCDR*. 2014;8(12):HC20.