

Assessment of Knowledge and Attitude among MAHSA Medical Students towards HIV/AIDS

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ABSTRACT

Introduction: According to the Ministry of Health Statistics, there have been 87,710 confirmed HIV infected cases in Malaysia. The objective of this study is to determine how well MAHSA University medical students knew about HIV/AIDS **Methods:** This was a cross-sectional questionnaire-based study conducted at MAHSA University's School of Medicine. The surveys focused on different mechanisms of transmission, high-risk behaviours, and prevention strategies. **Results** A total of 360 medical students participate in this study. Medical students in pre-clinical years had substantially higher knowledge ratings than those in clinical years ($p=0.045$). Comfortableness dealing with HIV/AIDS patients had the highest stigmatizing score (3.78 ± 0.86). Attitudes toward imposed measures had the lowest stigmatization score (mean 2.60 ± 0.62), knowledge score is significantly correlate with stigmatizing attitude ($P=0.004$). In addition, higher knowledge scores were shown among medical students who reported to have previous encounters with patients living with HIV/AIDS (PLWHA) ($p<0.001$). Knowledge scores were significantly low among the patients living with HIV (PEWHIV) (4.2 ± 1.67) ($P=0.019$). Concerning mother to child transmission of HIV/AIDS infection, clinical medical students showed higher degree of knowledge as compare with preclinical years medical students with P value <0.05 . **Conclusion:** The knowledge of medical students in MAHSA University is generally high, awareness of HIV transmission from mother to child through breast milk is still lacking, indicating that this is the most significant feature that has to be stressed and improved in future medical curriculum for better health care services and public education.

KEYWORDS: HIV, medical students, MAHSA, attitude

INTRODUCTION

The human immunodeficiency virus (HIV) is the virus that can lead to Acquired immunodeficiency syndrome (AIDS) when the immune system of the body is altered. AIDS represents an advanced stage of the infection [1].

HIV/AIDS remains as one of the world's most serious public health challenge. The social and economic negative impacts on a nation due to HIV/AIDS are serious and substantial. In addition, the physiological, mental, social and spiritual well-being of society is equally affected [2].

In the control, attempts to eradication of human immunodeficiency virus (HIV) and in the continuing search of a cure for acquired immunodeficiency syndrome (AIDS), awareness, education, social support

and the assurance that everyone living with HIV/AIDS will have access to treatment is crucial.

For this endeavor to succeed, a universal/global commitment is needed. As of now, there is NO cure for HIV/AIDS. The practical approach is to intensify our efforts to prevent the spread of the disease. This will require us to create greater awareness and to educate the public; more particularly the vulnerable groups, of safe practices to prevent and how the disease is transmitted.

This will help individuals to protect themselves from infection. Hopefully, they will in turn pass down the knowledge to other members of their groups. Further we must stress on the vulnerable groups that early testing and lifestyle changes can reduce and

prevent further spread of this dreadful infection [3].

Medical students are the future health-care providers who will put in place proper preventive measures and health-education programmes to increase public awareness. As a result, it is critical that these future doctors have a thorough understanding of this deadly virus.

According to a national survey of Malaysian young adults, understanding about HIV/AIDS is weak in transmission routes such as tattooing and piercing, sharing personal goods, and breast-feeding from an infected mother. More education and intervention initiatives are needed to promote HIV/AIDS knowledge and awareness, according to the findings of this national survey [4].

Malaysia is a country with concentrated HIV epidemic with infection rates remaining high as it was estimated in 2013 that every day almost 10 Malaysians become HIV infected [4]. Previous studies in public medical universities in Malaysia have targeted medical students [5]. There is no study conducted before to assess the knowledge and attitude of students in private medical universities. MAHSA University is a private university with high ratio of foreigner students with different cultural and religious background.

MATERIALS AND METHODS

This study was a cross sectional study among medical students at college of medicine MAHSA University, Saujana Putra Campus and Jalan University Campus. The study protocols and procedures were approved by the MAHSA University Ethical Committee (RMC/EC32/2018). Data collection was carried out between January and March 2019.

This current study expected sample size was 300, but it was normalised to 360 to account for non-response rates and boost the study's power. The calculated sample size was based on a confidence interval of 95.0% with a margin of error of 5.0% using 0.88 estimated standard deviation of stigmatizing attitude mean scores of a previous study⁵ using the formula $n = (Z^2 * \sigma^2) / d^2$, (N = number of participants).

Simple random sampling using a random table was used to select the participants who were included in this study.

Students in the first to fifth years of medical school at MAHSA University are eligible to participate in the study, with the exception of those who have refused, are on leave, or have participated in the pilot study, in which year one and year two students are considered preclinical medical students, while the third, fourth, and fifth year students are considered clinical medical students. The questionnaire, information sheet, and consent form were presented to the selected students in the lecture hall.

The survey tool was a self-administered English-language questionnaire with structured close-ended questions that has previously been verified and used [5,6]. However, a pilot study of 20 students was done to assure clarity and simplicity. The questionnaire consisted of four sections: The first component of the questionnaire asked about the respondents' socio-demographic factors, such as gender, age, ethnicity, academic year of study, religion, religiosity, and past HIV/AIDS cases. Adherence to one's religion's teachings/ceremony/way of life was described as religiosity; encounter related to having directly known, observed, or interacted with a person diagnosed with HIV/AIDS. The survey's second, third, and fourth sections assessed knowledge and stigmatising attitudes concerning HIV/AIDS.

Six closed-ended questions were used to test HIV/AIDS knowledge, and the total number of correct replies was calculated and used in the analysis, items are listed in Table 2. To determine the level for knowledge, each correct answer was given '1' point and the wrong answer was given '0' point, then all the obtained points were totaled up to form a final score.

On a five-point Likert scale, the items assessing stigmatising attitudes were graded. The responses ranged from 1 (strongly disagree) to 5 (strongly agree) (strongly agree). Similarly, the statements judging acts of discrimination were ranked, with responses ranging from 1 (never) to 5 (all the time). As a result, a score of 5 indicates that a student answered all questions in a non-discriminatory and stigmatising manner. Hence, the total score is ranged between 5-25 points.

Statistical analyses

Data were analyzed using Statistical Package for Social Science (SPSS) version 23. The study participants' demographic parameters and socioeconomic position were analyzed using descriptive statistics. Continuous variables are shown as mean standard deviation, while categorical data are provided as frequency and percentage. The Chi square test was employed to determine the relationship between socio-demographic characteristics and study phase. The mean difference in knowledge and attitude between the two groups was determined using a T-test (preclinical vs clinical group). The relationship between the knowledge and attitude was tested using Pearson Correlation. A statistically significant P value of less than 0.05 will be considered.

RESULTS

A total of 360 participants were recruited with 95% response rate, with equal proportion from all academic years. The mean age of pre-clinical and clinical students were 20.1(SD1.36) and 22.7(SD1.5) years old, respectively.

The gender split is almost similar across the two groups, where 61.5% females and 38.5% males were from pre-clinical while 69.3% females and 30.7% males were from clinical years. In terms of ethnicity, the majority of students are Chinese in two groups. When it came to religiosity, the majority of them said they were religious in their own faith. However, ethnic backgrounds of the two pre-clinical and clinical groups were significantly different ($p= 0.016$). Medical students in clinical years reported to have significantly encountered more patients living with AIDS (PLWHA) than students in pre-clinical ($p<0.001$), as shown in Table 1.

Table 1 Characteristics of study participants according to academic year

Variables	Pre-clinical (n=148), n(%)	Clinical (n=212) n(%)	χ^2 Value	P value
Gender				
Male	57(38.5)	65(30.7)	2.39	0.121
Female	91(61.5)	147(69.3)		
Ethnicity				
Malay	20(13.5)	55(25.9)	10.3	0.016*
Chinese	54(36.5)	75(35.4)		
Indian	54(36.5)	53(25.0)		
Others	20(13.5)	29(13.7)		
Patients living with HIV/AIDS (PLWHA)				
No	143(96.6)	110(51.9)	83.5	<0.001*
Yes	5(3.4)	102(48.1)		
Religiosity				
Yes	102(68.9)	177(83.5)	10.6	0.001*
No	46(31.1)	35(16.5)		
Religion				
Islam	44(29.7)	81(38.2)	5.4	0.224
Buddhism	36(24.3)	49(23.1)		
Christian	22(14.9)	24(11.3)		

*Statistically significant at $p < 0.05$

Table 2 Proportion of correct answer for the questions testing on the knowledge on HIV/AIDS according to the academic years, n= 360

Items	Pre-clinical (n, %)	Clinical (n, %)	χ^2 Value	P-value*
One can contact HIV infection by sharing meals with an HIV infected person	25(16.8)	20(9.4)	4.6	0.099
Procedures for avoiding hepatitis B infection and HIV infection are similar	69(46.6)	164(77.3)	39.3	<0.001**
Most newborns born to HIV-positive woman have HIV/AIDS infection at birth	125(84.4)	122(57.5)	30.2	<0.001**
After needle stick injury with a needle from HIV-infected patient, immediately gently expressing blood from the puncture site reduces the risk of contracting HIV infection	40(27.0)	48(22.6)	5.1	0.079
After needle stick injury with a needle from HIV-infected patient, the chance of contracting HIV virus is less than 1 %	17(11.4)	44(20.7)	7.2	0.027**
Through sexual contact gonorrhoea is more easily transmitted than HIV virus	67(45.2)	107(50.4)	1.4	0.475

*Chi square test

**Statistically significant at p<0.05

There is a statistically significant difference in the knowledge level between the preclinical and clinical group in some items. The results are displayed in items 2 and 5 which are about the similarity in the procedures for avoiding hepatitis B infection and HIV infection, and the chance of contracting HIV virus after needle stick injury with a needle from HIV-infected patient. The proportion of correct answers among clinical group were higher than that among the preclinical group. However, item 3 which is about the probability of transmission of infection from the mother to her baby, there is a slightly higher knowledge level among the pre-clinical group in comparison to the clinical group

(84.4% vs. 57.5%). Moreover, there was no significant difference between the two groups in the other items (item 1, 4 and 6) as shown in Table 2.

The subscale “Comfort dealing with HIV/AIDS patients” (mean 3.78 SD 0.86) had the highest stigmatising score, followed by “Attitudes of blame/judgment” (mean 3.78 SD 0.86). (mean 2.62 SD 0.1.19). The subscale “attitudes toward enforced measures” had the lowest stigmatisation score (mean 2.60 SD 0.62). The item “I am comfortable providing health services to clients who are HIV positive” had the highest stigmatisation score of 3.95 (SD 0.79) and more than half of the students agreed with it, as shown in Table 3.

Table 3 Attitudes towards HIV/AIDS patients among MAHSA medical students

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree	Mean (SD)
Attitudes toward imposed measures						2.62(1.1)
All patients admitted to the hospital should be HIV-tested	7(1.9)	67(18.6)	60(16.6)	133(36.9)	93(25.8)	2.34(1.1)
Relatives/sexual partners of patients with HIV/AIDS should be notified of the patient status even without his/her consent	20(5.6)	95(26.4)	50(13.9)	107(29.7)	88(24.4)	2.59(1.2)
Patients with HIV/AIDS should be cared and treated in their own hospitals and facilities, away from other patients who don't have HIV/AIDS	31(8.6)	118(32.8)	73(20.3)	91(25.3)	47(13.1)	2.99(1.2)
A health professional with HIV/AIDS should not be working in any area of health care that requires patient contact	22(6.1)	73(20.3)	79(21.9)	106(29.4)	80(22.2)	2.59(1.2)
Attitudes of blame/judgement						2.60(0.6)
I feel more sympathetic toward people who get AIDS from blood transfusion than those who get it from intravenous drug abuse	6(1.7)	23(6.4)	57(15.8)	114(31.7)	160(44.4)	1.89(1.0)
I feel that if a child contracts the HIV/AIDS virus from a mother through mother-to-child or vertical transmission, the mother is blame for the child's disease	26(7.2)	81(22.5)	98(27.2)	97(26.9)	58(16.1)	2.78(1.17)
I have little sympathy for people who get AIDS from sexual promiscuity	33(9.2)	93(25.8)	145(40.3)	64(17.8)	25(6.9)	3.13(1.03)

**Comfortableness
dealing with
HIV/AIDS patients**

3.78(0.86)

I am comfortable providing health services to clients who are HIV positive.	84(23.3)	192(53.3)	68(18.9)	14(3.9)	2(0.6)	3.95(0.79)
I am comfortable putting a drip in someone who is showing sign of AIDS	58(16.1)	153(42.5)	106(29.4)	37(10.3)	6(1.7)	3.61(0.93)

The mean knowledge score among study participant is 4.58 SD 1.91 (minimum 0, maximum 10) and the mean attitude is 28.14 SD 4.69 (minimum 10, maximum 39), as shown in Table 4.

There is a statistically significant higher score in the mean knowledge among the pre-clinical years (4.8 SD 2.07)

in comparison to those in the clinical group (4.4 SD 1.78) (t=2.01, CI: 0.00-0.81, p<0.05). In addition, there is a statistically significant higher score in the mean attitude among the pre-clinical years (28.7 SD 4.7) in comparison to those in the clinical group (27.7 SD 4.5) (t=2.03, CI: 0.03-2.00, p<0.05), as shown in Table 5.

Table 4 Total knowledge and attitude score

Score	N	Minimum	Maximum	Mean	SD
Knowledge score	360	0.00	10.00	4.58	1.91
Attitude score	360	10.00	39.00	28.14	4.69

Table 5 Differences of knowledge and attitude score according to academic year (n=360)

Score	Mean (SD)	t-value	P	95% CI
Knowledge score				
Pre- clinical	4.8(2.07)	2.013	0.045	(0.009-0.813)
Clinical	4.4(1.78)			
Attitude score				
Pre- clinical	28.7(4.7)	2.032	0.043	(0.032-2.00)
Clinical	27.7(4.5)			

A Person correlation was run to determine the relationship between the knowledge and attitude score. There was a weak, negative correlation between the knowledge score and stigmatising attitude, which was statistically significant ($r=-0.153$, $n=360$, $p=0.004$), as shown in Table 6.

The Knowledge score is unrelated to gender or religiosity. However, there is a statistically significant difference in the knowledge level between those with previous encounter with HIV patient and those without previous encounter with HIV patient where the second group scored higher (4.2 vs. 4.7, $p<0.05$) as shown in Table 7.

Table 6 Correlation between knowledge and attitude score

		Knowledge score	Attitude score
Knowledge score	Pearson Correlation	1	-0.153
	Sig. (2-tailed)		0.004
	N	360	360
Attitude score	Pearson Correlation	-0.153	1
	Sig. (2-tailed)	0.004	
	N	360	360

Table 7 Mean difference in knowledge score according to different variables (n=360)

Variables	Mean (SD)	t-value*	P	95% CI
Gender				
Male	4.7(1.9)	1.11	0.266	(-0.67-0.49)
Female	1.5(1.8)			
Religiosity				
Yes	4.5(1.9)	2.36	0.498	(-0.63-0.31)
No	4.7(1.9)			
Previous encounter				
Yes	4.2(1.67)	2.36	0.019**	(0.18-0.95)
No	4.7(1.9)			

*Student's t-test

**Statistically significant

DISCUSSION

The goal of this study was to determine how well MAHSA medical students knew about HIV/AIDS and how they felt about it. The pre-clinical and clinical students were 20.1 (SD1.36) and 22.7 (SD1.5) years old, respectively, according to our findings. When compared to HIV infection by sharing meals with an HIV infected person, preclinical year students exhibit fewer reactions [8,9]. Furthermore, clinical year students are about 71% more aware of hepatitis B and HIV infection, avoiding surgery. The risk of catching HIV virus through a needle stick injury using a needle from an HIV-infected patient is less than 1%, according to the findings, and 44 percent of clinical students are aware of AIDS. These finding are in agreement with researches done in other countries [10,11], clinical students know about infant HIV

infection, needle contamination, and gonorrhoea transmission in proportions of 49.4 percent, 72.1 percent, and 61.5 percent, respectively [10,11].

The proportion of those had the attitude of blame/judgment is low among study participants. Furthermore, the data revealed that the majority of medical students (76.6) are comfortable providing health services to HIV/AIDS patients. To our knowledge, this is the first time a study of preclinical and clinical year students has been conducted. When looking at the many sources of HIV information in terms of knowledge and attitude, medical students find that the media has a significant role. In line with our findings, a previous study identified the same influencing elements that affect students [12]. Most of

the studies encompass the general population and not with preclinical and clinical students [13,14,15].

Preclinical and clinical students get HIV/AIDS knowledge from the same sources as the general public, according to the findings. This discovery is not particularly novel, as the popular media has always played a significant role in raising public awareness about a variety of health issues, including HIV knowledge and attitudes. Most of the studies reported the internet source is a major source to get more information about HIV/AIDS, this is agreeing from the general public and medical students [16,17].

Clinical years medical students are more exposed to medical scenarios and situations in which they have to deal with patient with severe illnesses and other blood borne disease, which makes them more compassionate and understanding when dealing with such patients [18,19].

This study showed a link between preclinical and clinical year students' knowledge and attitudes about HIV/AIDS. All people who work in the medical system must have a positive attitude and understanding of patient confidentiality. We can allow the information to be provided, if necessary, with patient consent, and this is also supervised by the ethical committee.

Surprisingly, we found that students' awareness of mother-to-child transmission was lacking in this study. Despite the fact that the majority of people were aware of the transmission at the time of delivery, a significant number were under the impression that transmission occurs mostly in utero. This is in contrast to our projected outcome of medical students having a higher proportion of right responses than young people. According to a poll of Malaysian young adults, 54.8 percent admitted transmission from an infected mother through breast-feeding. [20]. In a study of Medical College Baroda 1st and 2nd year MBBS students, 29 percent were unaware that HIV/AIDS might be spread through breast feeding. [17]. A study among traditional birth attendants in Nigeria found that 62 percent identified breastfeeding as a route of transfer, but only 31.5 percent mentioned childbirth as a possible way of transmission. [21].

The limitation of this study lies in the fact that a small subset of students was included and this may not be a true representative sample of the medical fraternity

in the whole private medical schools, furthermore the participants were from single educational institute only, thus the external validity of our results is limited. Factors that can influence the knowledge and attitude towards HIV/AIDS patients such as family background were not studied. As our study is a cross-sectional study, we can only analyse the results at one point of time, thus a longitudinal study can be conducted in the future to observe students' knowledge and attitude over time.

Further study is required to examine how the reported attitudes and knowledge of medical students translate into their clinical practice and with a wider representative sample of students from the health care training institutions in Malaysia.

CONCLUSION

While this study found that medical students had a decent awareness of HIV and have positive attitudes and views about it, it also found significant gaps in comprehension and the possibility for stigmatising mindsets among students. The findings highlight the necessity for health-care training institutions to review and improve their HIV-related curriculum to stress HIV-infected patients' vulnerability and protection under the Human Rights Act. As part of the curriculum, more focus should be placed on exposing medical students to clinical care of HIV patients. Medical students who will be delivering HIV treatment and care should have a thorough understanding of the virus and be able to incorporate humanistic attitudes into their clinical practice.

Conflict of Interest

Authors declare none.

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Authors' Contribution

Aws AL-Kadhim, Sarah Al-Ani, Munandy Alagar, Lee Phon Yong, Gomalata Devadas, Chandrasekaran Selvaraj and Meram Azzani were equally involved and contributed to the conduction this study, and all were actively involved in writing up and critical revision for this manuscript.

REFERENCES

1. Vijendra Pal Singh, Izni Syazana Osman, Nur Amanina Rahmat, Nur Ashikin Abu Bakar, Nurul Fathin Natasha Abdul Razak, Sowmya Nettem. Knowledge and Attitude of Dental Students towards HIV/AIDS Patients in Melaka, Malaysia. *Malays J Med Sci.* 2017; 24(3): 73–82.
2. Dhanya R S, Hegde V, Anila S, Sam G, Khajuria RR, Singh R. Knowledge, attitude, and practice towards HIV patients among dentists. *J Int Soc Prevent Communit Dent* 2017; 7:148-53.
3. Dharmalingam M, Poreddi V, Gandhi S, Chandra R. Under graduate nursing students' knowledge and attitude toward people living with human immunodeficiency virus/acquired immunodeficiency syndrome. *Int J Adv Med Health Res* 2015; 2:22-7.
4. Florence N Samkange-Zeeb, Lena Spallek, Hajo Zeeb. Awareness and knowledge of sexually transmitted diseases (STDs) among school-going adolescents in Europe: a systematic review of published literature. *BMC Public Health.* 2011; 11: 727.
5. Al-Kadhim, Aws Hashim Ali, Ahmad Bakri, Nurul Ainaa Syamimi, Ameruddin, Anis Mardhiya, Al-Ani, Sarah Taha Yousif, Jaafar, Azlan (2019) Assessment of knowledge and attitude towards HIV patients among dental students in Universiti Sains Islam Malaysia (USIM). *Journal of clinical health and science* 2019; 4(2): 58-65
6. Haroun D, El Saleh O, Wood L, Mechli R, Al Marzouqi N, Anouti S. Assessing Knowledge of, and Attitudes to, HIV/AIDS among University Students in the United Arab Emirates. *PLoS ONE.* 2016; 11(2): e0149920.
7. Mohammad Reza Ghasemi, Hossein Karimi Moonaghi, Abbas Heydari. Student-related factors affecting academic engagement: A qualitative study exploring the experiences of Iranian undergraduate nursing students. *Electron Physician.* 2018; 10(7): 7078–7085.
8. Lennart Visser, Fred Korthagen AJ, Judith Schoonenboom. Differences in Learning Characteristics Between Students With High, Average, and Low Levels of Academic Procrastination: Students' Views on Factors Influencing Their Learning. *Front Psychol.* 2018; 9: 808.
9. John Ioannidis PA. Why Most Clinical Research Is Not Useful. *PLoS Med.* 2016; 13(6): e1002049.
10. K Oppong Asante, Oti-Boadi M. HIV/AIDS knowledge among undergraduate university students: implications for health education programs in Ghana. *Afr Health Sci.* 2013; 13(2): 270–277.
11. Piyali das, Subhradev biswas, Ramji singh, Sanhita mukherjee, Sharmistha Ghoshal,1 and Debasis pramanik. Effectiveness of early clinical exposure in learning respiratory physiology among the newly entrant MBBS students. *J Adv Med Educ Prof.* 2017; 5(1): 6–10.
12. Sebastian Porsdam Mann, Julian Savulescu, Barbara J. Sahakian. Facilitating the ethical use of health data for the benefit of society: electronic health records, consent and the duty of easy rescue. *Philos Trans A Math Phys Eng Sci.* 2016; 374(2083): 20160130.
13. Andrewin A, Chien LY. Stigmatization of patients with HIV/AIDS among doctors and nurses in Belize. *AIDS Patient Care STDS* 2008; 22(11): 897-906.
14. B. H. Chew BH and A. T. Cheong, “Assessing HIV/AIDS knowledge and stigmatizing attitudes among medical students in Universiti Putra Malaysia. *The Medical Journal of Malaysia.* 2013; 68(1): 24–29.
15. Orisatoki O Rotimi, Oguntibeju O Oluwafemi. Knowledge and Attitudes of Students in a Caribbean Medical School towards HIV/AIDS. *African Journal of Biomedical Research* 2008; 11: 137 – 143.
16. Schoenborn, C.A., Marsh, S.L., Hardy, A.M. AIDS knowledge and Attitudes, Data from the National Health Interview Survey. *Adv Data* 1994; 23:1-11.

17. Shaikh Mohsin, Sunil Nayak, Vipul Mandaviya. Medical students' knowledge and attitudes related to HIV/AIDS. *National Journal of Community Medicine* 2010; 1(2): 146-149.
18. Andargie G, et al. Low prevalence of HIV infection, and knowledge, attitude and practice on HIV/AIDS among high school students in Gondar, Northwest Ethiopia. *Ethiop.J.Health Dev.* 2007; 21(2):179-182.
19. Abdeyazdan Z, Sadeghi N. Knowledge and attitude toward AIDS/HIV among senior school students in Isfahan. *Iranian Journal of Clinical Infectious Diseases* 2008; 3(2): 93-98.
20. Wong LP, Chin CKL, Low WY, Jaafar N. HIV/AIDS-Related Knowledge Among Malaysian Young Adults: Findings From a Nationwide Survey. Posted: 06/24/2008; *Medscape J Med.* 2008; 10(6):148
21. Mobolanle Balogun, Kofo Odeyemi. Knowledge and practice of prevention of mother-to-child transmission of HIV among traditional birth attendants in Lagos State, Nigeria. *Pan African Medical Journal.* 2010; 5(7): This article is available online at: <http://www.panafrican-med-journal.com/content/content/article/5/7/full>