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Knowledge, Attitude and Practice of the use of Antibiotics among Students and Staff at a Local University in Malaysia

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ABSTRACT

Inappropriate use of antibiotics (AB) is a significant public health problem. Understanding the patterns of AB-taking behaviour helps in designing educational campaigns to curb the overuse of AB. The objective of this study was to determine the levels of knowledge, attitudes and practices (KAP) of AB usage among students and staff at the National Defence University of Malaysia. This cross-sectional study was conducted in July 2018. A self-administered questionnaire was used. Data were described by frequencies and percentages. Chi-square test was used to compare KAP levels between students and staff. The level of significance was established as $p \leq 0.05$. This study revealed that fair level of knowledge about AB usage did not translate into positive attitudes and high levels of practices. Overall, students demonstrated poorer KAP regarding indiscriminate usage of AB than staff. Specifically, students had poorer knowledge about its role in ineffectiveness of treatment ($p=0.013$) and additional burden of medical cost to the patient ($p=0.001$). Additionally, students were more likely than staff to give the leftover AB to their friends if they become sick ($p=0.024$). The findings of this study may serve as a preliminary insight on the development of an effective intervention to improve attitudes and practices regarding AB usage.

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Introduction

The threat of antimicrobial resistance (AMR) is rapidly progressing and intensifying, such that it produces a significant threat to public health globally in the 21st century [1]. AMR leads to therapeutic ineffectiveness, increase treatment failures and results in longer and more severe illness episodes with higher costs and mortality rates [2]. One of the factors contributing to AMR is inappropriate drug use in humans [3]. Antibiotic therapy has become the focus of growing public attention because of reduced patient safety seen with the misuse of these important agents. The use of broad-spectrum AB for self-limited non-bacterial infections, such as upper respiratory tract infections, bronchitis and pharyngitis, predisposes patients to the development of microbial resistance [4, 5]. In many cases, parental pressure for AB

influenced the physician's decision to prescribe [6]. Additionally, self-medication with AB, which is highly prevalent in Southeast Asian region, is associated with the risk of indiscriminate drug use [7]. Other factors include poor health care access and affordability and poor regulatory controls on the use of prescription drugs [8].

Various approaches have been taken to meet the challenges of the misuse and overuse of antimicrobial drugs. One of the approaches which is commonly suggested is to undertake instructional and educational campaigns among the general population about antibiotic resistance, its dangerous consequences and ways of its limitation. Public campaigns on raising awareness about appropriate antibiotic consumption have been effective in different populations [9, 10]. Specifically, raising awareness of the dangers of self-medication with AB could help contain AB misuse [11]. The steps taken to raise awareness about AMR usually aim to change the behavior in the target group, and the outcome of these interventions is affected by the previous beliefs and motivations held by this group. Therefore, before planning any public campaign or educational activity, it is important to be aware of the baseline knowledge, attitudes and practices (KAP) of the target population regarding appropriate AB use [12].

Aim

This study was undertaken to assess KAP regarding the use of AB among undergraduate students and staff of the National Defence University of Malaysia. A better understanding of what the students and staff know and believe about the issues of AB usage and AMR can assist in planning and devising effective educational interventions.

Methodology

i. Study Design and Setting

This study applied a cross-sectional self-administered questionnaire design. The research was carried out among a university community of the National Defence University of Malaysia (NDUM). The NDUM offers courses in engineering, management, sciences and medicine. The total population of undergraduate students and staff is about 2,700 people. The choice of the setting was determined by the NDUM location in the most populated and rapidly developing KL Metropolitan Area. Furthermore, a vibrant university community, encompassing students, as well as academic and non-academic staff, serves as a basic setting for health promotion.

ii. Sampling method

The lists of all students and employees were sourced as a sampling frame. A stratified sampling method was used to achieve a better representation of the study participants. The ratio of undergraduate students to staff is two to one, so strata of 80 students and 40 staff were calculated to achieve the total sample size of 120 respondents. The strata were also defined by course of study for the students and by department for the staff.

iii. Participants and data collection

Individuals aged 18 and above, who were undergraduate students or employees of the NDUM at the time of the research, were included in this study. Post-graduate students met exclusion criteria because most of them were present on campus only during examinations. The foundation program students were excluded because they were in transition from secondary school to the realities of tertiary education and university life. Non-Malaysian citizens were excluded because their KAP regarding the use of AB could have been influenced by factors that were not present in the study area. The study was conducted on July 26, 2018. Students from designated courses were approached during a break between classes, staff were contacted at their workplace. The questionnaires were distributed to those who had given informed consent. Upon completion, the participants put the questionnaires in boxes carried by the investigators to ensure anonymity.

iv. Study instrument

A structured questionnaire was designed via focus group discussions, pre-tested on a group of 10 students and 5 staff and used in this study. The questionnaire contained three domains: 1) knowledge, 2) attitudes and 3) practices regarding the use of AB. The answer options to four questions on indiscriminate use of AB were 'true' and 'false' and to five statements on attitudes were 'agree' and 'disagree'. Six questions on practices were answered as 'rarely', 'occasionally' and 'frequently'. The 'true' option to all knowledge questions was the correct answer. Four out of five attitudes' items and three out of six practices' items were negatively worded.

v. Data Analysis

The data were analysed using SPSS, version 21 (SPSS, Chicago, IL). Frequencies and percentages were used to describe the variables. Statistical significance for the comparison of KAP levels between students and staff was calculated using a Chi-square test. The level of significance was established as $p \leq 0.05$.

Results

Overall, out of 120 individuals invited to participate in this study, 114 (95.0%) completed a questionnaire, including 71 undergraduate students and 43 staff. The majority were males (70.8%) and Malay (78.3%).

Table 1 shows that most of the students and staff correctly answered the questions related to knowledge. Overall, staff demonstrated higher level of knowledge than the students. This difference was statistically significant with regards to two knowledge-related questions. Proportion of those who correctly answered that indiscriminate use of AB can lead to additional burden of cost to the patient was 38.1% ($p = 0.001$) higher among staff than students, and proportion of those who answered that it can lead to ineffective treatment was 21.2% ($p = 0.013$) higher among staff than students.

Table 1: Distribution of responses to questions on knowledge about antibiotics usage

Questions	True		False		p value
	n	%	n	%	
1 Indiscriminate use of antibiotics can lead to <i>ineffective treatment</i>					
students	46	64.8	25	35.2	0.013
staff	37	86.0	6	14.0	
2 Indiscriminate use of antibiotics can lead to <i>exacerbation or prolongation of illness</i>					
students	40	58.0	29	42.0	0.210
staff	30	69.8	12	30.2	
3 Indiscriminate use of antibiotics can lead to <i>emergence of bacterial resistance</i>					
students	50	70.4	21	29.6	0.645
staff	32	74.4	11	25.6	
4 Indiscriminate use of antibiotics can lead to <i>additional burden of medical cost to the patient</i>					
students	39	54.9	32	45.1	0.001
staff	40	93.0	3	7.0	

Table 2 shows the distribution of responses to statements on attitudes towards AB usage. The responses to most of the statements demonstrated negative attitudes and stereotypes towards indiscriminate use of AB, especially among the students. The majority agreed that *when they have a cold, they should take AB to prevent getting a more serious illness* (69.0% of students, 58.5% of staff), *AB help them recover from a cold quickly* (79.7% of students, 66.7% of staff) and *AB are safe drugs that can be commonly used* (65.3% of students, 54.5% of staff). Most students (65.0%) and almost half of staff (43.8%) agreed that *skipping one or two doses of AB does not contribute to the development of AB resistance*.

Table 2: Distribution of responses to statements on attitudes towards antibiotics usage

Statements	True		False		p value
	n	%	n	%	
1 <i>When I have a cold, I should take antibiotics to prevent getting a more serious illness</i>					
students	40	69.0	18	31.0	0.285
staff	24	58.5	17	41.5	
2 <i>When I get fever, antibiotics help me to get better more quickly</i>					
students	47	79.7	12	20.3	0.149
staff	26	66.7	13	33.3	
3 <i>When I take antibiotics, I contribute to the development of antibiotic resistance</i>					
students	42	89.4	5	10.6	0.335
staff	27	81.8	6	18.2	
4 <i>Skipping one or two doses doesn't contribute to the development of antibiotic resistance</i>					
students	26	65.0	14	35.0	0.071
staff	14	43.8	18	56.2	
5 <i>Antibiotics are safe drugs and can be commonly used</i>					
students	32	65.3	17	34.7	0.327
staff	18	54.5	15	45.5	

The distribution of responses to questions on practices of AB usage is shown in Table 3. The overall practice pattern was poor among most of the respondents. Almost one-third (28.3% of students, 26.5% of staff) reported frequently *stopping treatment with AB after feeling better*. About half of respondents (48.9% of students, 56.2% of staff) *save the remaining AB for the next time they get sick*. The majority (75.8% of students, 78.8% of staff) only rarely or occasionally *discards the remaining AB*. Generally, students reported poorer practices of AB usage than staff. More than half of students (55.1%) and a substantial proportion of staff (38.1%) only rarely or occasionally *complete the full course of treatment with AB*. One-third of students (35.4%) compared to only a small number of staff (13.3%) frequently *give the leftover AB to their friends if they get sick*, and this difference is statistically significant ($p = 0.024$).

Table 3: Distribution of responses to questions on practices of antibiotics usage

Statements	Rarely		Occasionally		Frequently		p value
	n	%	n	%	n	%	
1 <i>Do you stop taking further treatment after feeling better?</i>							
students	16	26.7	27	45.0	17	28.3	0.314
staff	14	41.2	11	32.4	9	26.5	
2 <i>Do you save the remaining antibiotics for the next time you get sick?</i>							
students	11	24.4	12	26.7	22	48.9	0.206
staff	6	37.5	1	6.2	9	56.2	
3 <i>Do you discard the remaining medication?</i>							
students	26	41.9	21	33.9	15	24.2	0.713
staff	12	36.4	14	42.4	7	21.2	
4 <i>Do you give the leftover antibiotics to your friends if they get sick?</i>							
students	11	22.9	20	41.7	17	35.4	0.024
staff	9	60.0	4	26.7	2	13.3	
5 <i>Do you complete the full course of treatment?</i>							
students	25	36.2	13	18.8	31	44.9	0.183
staff	9	21.4	7	16.7	26	61.9	

Statements	Rarely		Occasionally		Frequently		p value
	n	%	n	%	n	%	
6 Do you consult a doctor before starting an antibiotic?							
students	9	12.7	13	18.3	49	69.0	0.078
staff	4	9.3	2	4.7	37	86.0	

Discussion

This study revealed fair level of knowledge about AB usage among university students and staff members. The finding is in line with other studies in similar settings [13-15]. However, the current study showed a negative attitude of respondents towards indiscriminate use of AB. In particular, 69.0% of students believed that they should use AB when they have common cold and 65.3% thought that AB are safe to be used in common practice. Similar findings were reported in a recent paper in the Caribbean [13]. The results were also comparable with previous literature when it was revealed that a reasonable number of participants believed skipping of doses would not contribute to AMR [13, 15].

Additionally, the results of this study show that increased knowledge about AB usage among the university community could not be translated into good practice pattern. The prevalence of AMR is thought to increase largely due to AB self-medication [16-18]. This study determined that a large proportion of respondents save the left-over AB for the next time they become sick. The results are in accordance with other published studies in Malaysia [19-21]. Effective outcome-based educational interventions promoting rational AB use could help to bridge the gap between knowledge and practice.

The staff exhibited higher levels of KAP than students. However, there is a possibility that none of the effects of the related variables may be observed when controlling for the other variables [22]. Noticeably, roles within the university are strongly related to socio-demographic characteristics, specifically age and education. For example, the recent study reported that the knowledge related to AB usage and AMR among staff of a Sri Lankan university was poor [23]. However, only non-academic staff members participated in this study, which means that individuals with higher levels of education were excluded. Similarly, the self-medication rate was found to be higher in younger people in the literature [24]. This situation can be linked to lower risk perception in youths. Therefore, socio-demographic variables should be taken into consideration while measuring the contribution of independent predictors of good KAP. Nevertheless, the objective to compare KAP between students and staff was appropriate; the implication of such a comparison was that, in a university setting, more persuasive messages on the use of AB should be spread amongst students than staff.

Conclusion

Overall, the university community demonstrated fair knowledge about the use of AB. However, it did not translate into positive attitudes and high levels of practices. This situation could be improved by educational interventions specifically addressing changes in belief structures to achieve proper practice of the AB usage.

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