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ASSESSMENT OF KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARD ANTIBIOTIC USAGE AND RESISTANCE: AN OBSERVATIONAL CROSS-SECTIONAL STUDY.

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BACKGROUND

Objectives: To monitor and assess the Knowledge, attitude and practice associated with antibiotic usage and their resistance through surveillance program. **Methodology**: This was a retrospective cross-sectional study conducted for a period of 6 months (Dec 2019 - June 2020). KAP questionnaire related to the antimicrobial resistance was utilized to assess the knowledge of pharmacy students and general population. The resultant data were then collected and computed in Microsoft Excel. Analyses were expressed as total number, frequencies and percentage. **Results:** Data from 618 respondents were collected for KAP questionnaire and analyzed. The average knowledge score of the students was found to be 66.2% while that of the general population was 68.9%. Overall, the general population scored higher (63%) than that of the students (48.5%). And on attitude scale, student population had 70% and general population had 67% scores. **Conclusion**: The inference of the present study can help in bridging the gap in future education, training and for adequate decision making about antibiotic usage. Knowledge on causative agents should be strengthened by education focusing on antibiotic usage and the resistance pattern.

KEYWORDS: Antibiotic, Culture, Sensitivity reports, Knowledge, Attitude, Practice, Microbial resistance.

INTRODUCTION

Antibiotics are medicines that combat bacterial infections with the aid of disrupting the method essential for bacterial cell grown and proliferation. AMR is a subsequent result of

evolution via natural selection or we can say due to irrational antibiotic usage.Extensive use of antibiotics establishes a negative profound impact in treating infectious diseases and controlling the resistance pattern in the community. However, the relation between antimicrobial use and resistance is complex process which can be implicit by KAP surveillance. KAP questionnaire is a standard surveillance program to understand the knowledge, attitude and practice of the general public regarding the usage of antibiotics and the emergence of AMR. The economic burden remains to upsurge as the number of resistant infections intensifies as well as the number of drugs to which each microorganism is resistant.[1] Pharmacy practice aims to contribute better health care and improve patient medication adherence.[2] The vital role of pharmacist is to promote antimicrobial stewardship (AMS) programs thereby ensuring the sustainable treatment for infection. MS programs aim to ensure judicious, appropriate and safe antimicrobial use. And the clearly explain the clinical and economic outcomes that can result from antibiotic-related pharmaceutical service.

METHOD

A retrospective cross-sectional study was conducted for a period of 6 months (Dec 2019 - June 2020) to assess knowledge, attitude and practice of general population and pharmacy student. The research protocol was approved by the Institutional Ethics Committee of VMCH.

The final questionnaire consisted of both 24 open and closed ended questions subdivided as four sections. The first section includes demographic data of respondent; the second section included 9 close ended questions assessing the sample populations' general knowledge on antibiotic; the third section included 7 close ended questions assessing the attitude of population on antibiotic usage and perceptions on antimicrobial resistance; the last section included 8 close and open ended questions on respondents' practice with regards on antibiotic usage. The survey form was dichotomized into true, false and don't know, then the score scale of each KAP section was assessed by securing 1 point for each correct answer and 0 points for incorrect answer. The sum of scores was calculated for 3 dimensions (KAP) of form with the maximum score scale for an individual in knowledge, attitude and practices sections was 9, 7 and 8 respectively. The resultant data of pharmacy students and general population were collected and entered in excel sheet and analyzed using simple descriptive analysis. The final results were expressed as total number, frequencies and percentage.

RESULT

Out of 618 participants, majority of participants were aware of existence of bacteria in human body (84%, 518) and 92% acknowledged antibiotic treats bacterial infections. Contrary to the former, lesser population (56%, 344) were aware that antibiotics would not treat viral infections. Amongst the knowledge based questions, K5, K8 and K9 were the lowest scored in the sample population. 79% of study respondents were ignorant about causative agents of common infections such as cough, cold, upper respiratory tract infections (URTI) etc and 47% preferred antibiotics for chest infections.

K9 possess >45% respondents who believe that frequent use of antibiotics could decrease the infection incidence. Whereas K4 shows better knowledge score, in which >74% approves completing the antibiotic course as prescribed in spite of their symptomatic relief. The average knowledge score amongst the students was 66.2% and 68.9% for the general population.

Table 1: Knowledge on Antibiotic Use and Resistance (N=618).

Qn. Code	QUESTIONS (CORRECT ANSWER)	No. of Respondents answered correct (%) (n=618)	No. of Students answered correct (%) (n=405)	No. of General Population answered correct (%) (n=213)
K1	Are there any bacteria in human body which can be helpful for us? YES	84	81	90
K2	Can antibiotics be used to cure infections caused by bacteria? YES	92	93	90
K3	Can antibiotics be used to cure infections caused by virus? NO	56	59	50
K4	Is it okay to stop taking antibiotics without finishing complete dose if you are Feeling well? NO	76	73	84
K5	Should chest infection always be treated with antibiotics? NO	53	46	38

K6	Can antibiotics cause any side effects? YES	70	65	80
K7	Have you heard the term "Antibiotic Resistance"? YES	80	85	70
K8	Can antibiotics speed up the recovery process of coldand cough?NO	21	20	24
K9	Do you think frequent use of antibiotics can decrease occurrence of infection? NO	53	46	66

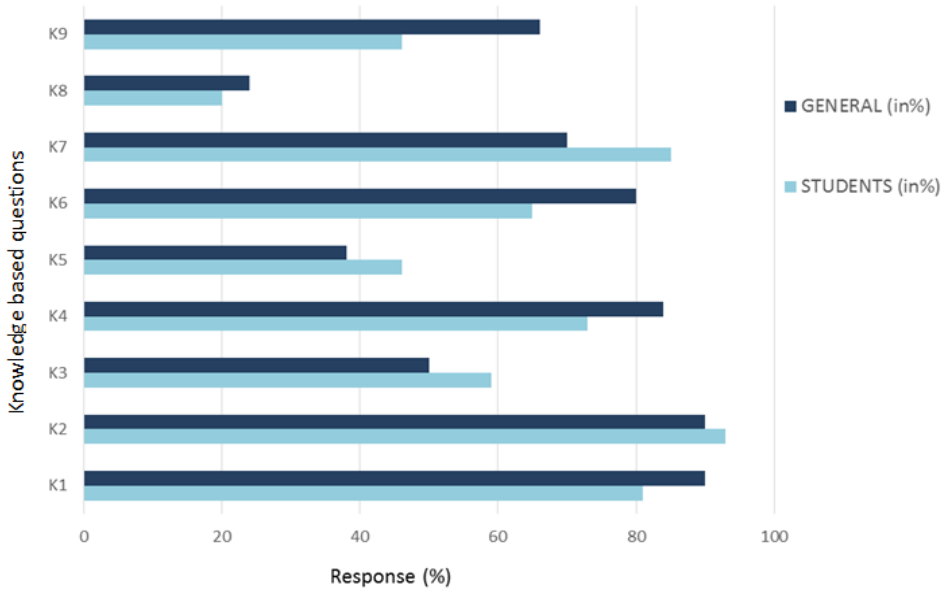

Figure 1: Responses to Questions Related to Knowledge.

Based on attitude data findings, <65% study sample agrees anti-microbial resistance is due to the antibiotic over-utilization. 80% of the general population thinks that antibiotics are being misused. A3 shows only 33% of the population ponders that AMR will not affect the health of their family. Amongst this, 26% of students and 44% of general sample believed it doesn't create an effect in one's health. One third of the population (242) preferred antibiotics for chest infection. In Contradict 76% acknowledges it is necessary to know the appropriate use of antibiotic. Overall, on average scale the general population scored higher (63%) than that of the students (48.5%).

Table 2: Attitude of study subjects on Antibiotic use and resistance.

Qn. Code	QUESTIONS (CORRECT ANSWER)	No. of Respondents answered correct (%) (n=618)	No. of Students answered correct (%) (n=405)	No. of General Populationanswered correct (%) (n=213)
A1	Do you think antibiotics are misused? YES	59	46	80
A2	Is the overuse of antibiotics result in antibiotic resistance? YES	65	64	67
A3	Does antibiotic resistance affect you or your family's health?YES	33	26	44
A4	Would you prefer a prescription containing antibiotics during chest Infection? NO	39	35	47
A5	Do you think that taking fewer antibiotics than prescribed is more beneficial? NO	60	60	61
A6	Is it necessary to know the rational use of antibiotics? YES	76	69	89
A7	Would you visit your doctor for follow-up after taking antibiotics? YES	45	40	54

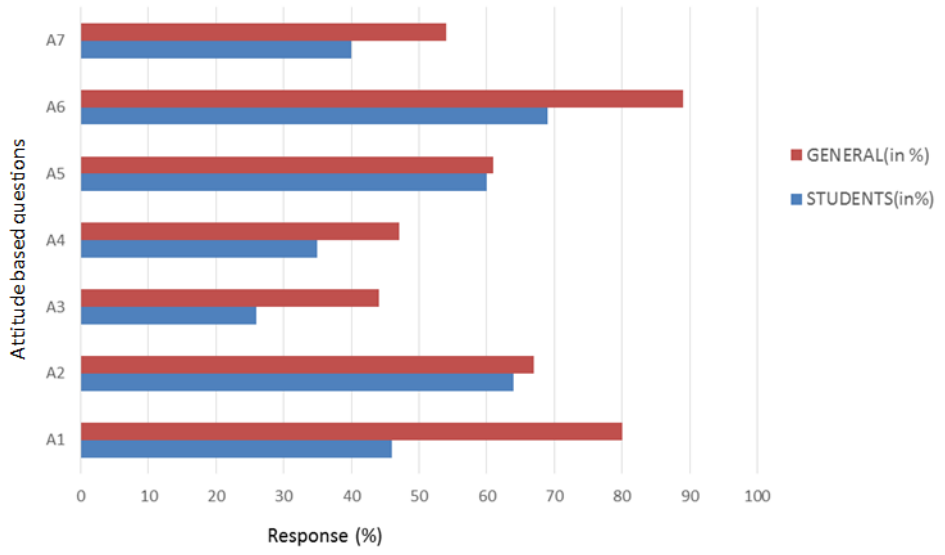

Figure 2: Responses to Questions Related to Attitude.

Nearly 84% of sample population reported of consulting the physician prior to antibiotic administration. Whereas 61% stated of not purchasing antibiotic drug from medical store, the 379 respondents were favoring the statement in which 65% belonged to student population and 54% were general population. Amongst this more than a half 523 (85%) respondents stated they share the antibiotic medication with their family and friends. 72% respondents reported to complete the duration course of their antibiotic prescription. On the other hand, 73% students and 70% general population discontinued their prescribed treatment duration.

Table 3: Practice about Antibiotic Usage and Resistance.

Qn. Code	QUESTIONS (CORRECT ANSWER)	No. of Respondents answered correct (%) (n=618)	No. of Students answered correct (%) (n=405)	No. of General Population answered correct (%) (n=213)
P1	Do you consult a doctor before starting an antibiotic? YES	84	82	88
P2	We can buy antibiotic from medicine shops/pharmacies directly.NO	61	65	54
P3	We can use antibiotics after the suggestions from friends/neighbours. NO	85	86	82
P4	Do you follow the advertisement (leaflets/internet etc.) while purchasing antibiotics? NO	74	73	76
P5	If you have cold and cough and the doctor does not prescribe antibiotics, what would you do? (follow doctor's suggestion)	42	48	30
P6	Do you share antibiotics with your friends/ familymembers if they get sick?NO	64	62	68
P7	Do you stop taking antibiotic without completing full course? NO	72	73	70

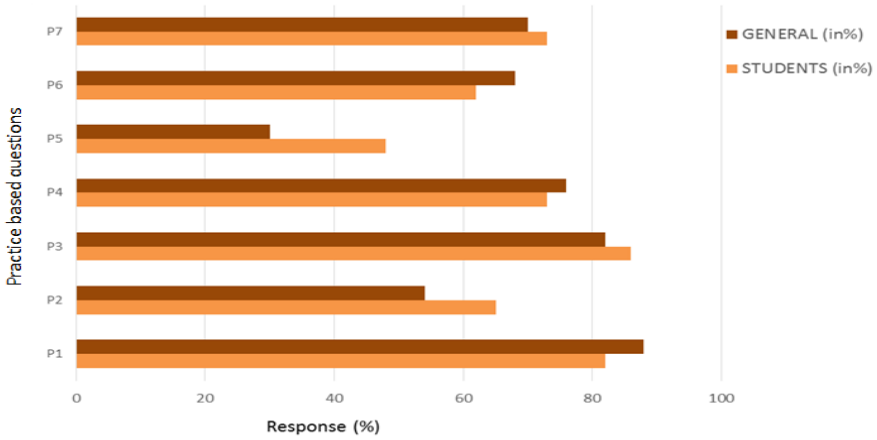

Figure 3: Responses to Questions Related to Practice.

DISCUSSION

The lack of knowledge can contribute in inappropriate use of antibiotics; mainly the general population has been identified as an important cause for the emergence of AMR in other studies.[3,4] With this concern in mind, the current study has focused on surveillance program to evaluate knowledge, attitude and practice (KAP) in students' of Swamy Vivekanandha College of Pharmacy and general population. Thus, the objective of this literature was also to determine the students' and general population KAP of antibiotic use and the effect of resistance in oneself and as a community.

In the knowledge study part, <85% of study sample was aware of the presence of beneficial bacteria in the body and antibiotics cure bacterial infections. Similar level of knowledge has been witnessed by other literatures.[5-7] In addition, 76% acknowledged in taking the complete prescription in spite of feeling better symptomatically. The general population showed better awareness on the same by 84% than the pharmacy students.

K3. K5 and K8 were the common questions that had given the most incorrect answers indicating there is confusion in the subjects regarding the causative agents of common infections. About, 41% of pharmacy students and 50% of general sample agreed antibiotics treats viral etiological infections. The alarming finding of the current study showed high percentage of subjects were unaware that antibiotics does not work for viral infections and ignorant about the infections under viral etiologies such as common cold, respiratory tract infections, sore throat etc. However this was not an isolated case, similar findings were also notified in different literatures which have been carried out in students and general population.[8-11]

In the studies conducted by Khan *et al* and Azevedo *et al.*, it was observed that 38% and >55% of sample population agreed to the usage of antibiotics against viral infections.[12-13] Whereas, in the current study, 56% of study population believes antibiotics can be taken as preventive measure for viral etiologies and 79%, agreed antibiotics can be taken for recovery from common cold, cough and chest infections. This finding was in concordance with other literatures conducted across the globe such as 83% subjects in eastern of Ethiopia, 61% in Lebanon, 20% in Italy.[14-16] Similarly in Euro barometer report 2013 and Napolitano et al, >50% of Italian general population believed antibiotics can kill virus and are beneficial for flu, fever and sore throat.[16,17] The misconceptions about antibiotic efficiency on viral infections are widespread as revealed by another study which is consistent with the findings

of a global survey conducted by the world health organization (WHO) in 2015.[18,19] The average knowledge score of student population is 66.2% and for general study sample is 68.9%.

In the attitude study part, it was identified that subjects were aware of emergence of AMR through indiscriminate and inappropriate utilization of antibiotics making them less pronounced in therapeutic management. But they weren't able to respond well if antibiotics could affect one and other's health or if they could work for viral infection such as URTI (Upper Respiratory Tract Infection) which is similar to other studies.[20-21]

For instance, the current study data showed almost 65% of subjects (64% pharmacy students and 67% of general population) agreed to the statement "misuse of antibiotics result in AMR". The above finding was comparable with the study conducted by Jifar and Ayele (2018) stating 78.4% of study population agreed the indiscriminate use of antibiotics can raise antibiotic resistance which was consistent with other reports like 72% in Namibia, 69.7% in Ethiopia, and 50% in Jordan.[14,22-24] Similarly, 76% stated the necessity of knowing the rational use of antibiotics, in contrast to the above 61% prefers a prescription with antibiotics for chest infection.

Amongst the 7 questions at attitude level, A3 and A4 questions possessed the lowest scores of 33% and 39% respectively. The study findings showed the subjects tend to have unawareness whether AMR could affect one and others' health. These findings call for more interventions into the matter to make student's and general population's attitude in line with the knowledge regarding antibiotic indications. Awareness on resistance towards antibiotics should be spread to a larger community through national information campaign or media; this way of approach has shown higher knowledge scores on AMR in other studies.[25-27] Higher knowledge and positive attitude is much needed strategy to bridge the "theory-practice gap" in AMR as this would lead to restrictive usage contributing to lower selective pressure. The average attitude score for students is 48.8% and for general population is 63.11%.

In the practice study part, >80% of both the study groups agreed in consulting the doctor before starting an antibiotic. Whereas, in contrast to the above situation 39% of participants purchased anti-microbial(s) directly from the medical stores. Purchase of antibiotics without prescription is a greater concern to curb the AMR, as they had been reported in various

studies, the highest counts were 32.7% in Italy, India 76%, 28.8% in Saudi Arabia, and 9% in Hong Kong.[16,28-30]

Nearly 85% of subjects had shown the right practices in not using antibiotics after suggestion from friends/ neighbors. However, comparatively to the former, lesser proportion (64%) has agreed of not sharing antibiotics with friends/ family members while they get sick. 28% of population states they stop taking prescription antibiotics and hence not completing the prescription course. This data was similar to the other studies which state that<20% of study population stop taking antibiotics when they are symptomatically relieved.[17,9]

CONCLUSION

According to the KAP surveillance programme, a good practice was noted in the subjects as majority of them reported in completing the antibiotic prescription. It was also noted that there is a theory-practice gap in the study population as they were not able to identify the viral and bacterial etiological infections.

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