

Knowledge, attitude and practice immediately before and following a three-day workshop on ‘Strategies for reducing antimicrobial resistance and promoting rational use of antimicrobials’

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Abstract

Context: Antimicrobials are commonly used worldwide. Reducing antimicrobial resistance (AMR) is an urgent matter to be addressed.

Aims: The study aimed to measure knowledge, attitude and practice (KAP) of participants before and after a three-day workshop on various strategies towards reducing antimicrobial resistance and promoting rational use of antimicrobials.

Settings and Design: The cross-sectional study was conducted during the workshop held from 17th to 19th April 2019 at a medical college in Nepal.

Methods and Material:

There were 33 participants. KAP scores were measured immediately before and after the workshop. A questionnaire containing twelve sections related to various themes of the workshop was developed. Feedback regarding each session was also obtained from all the participants.

Statistical analysis used: Mean scores were compared among participants before and after the workshop. The ratings for individual sessions were also calculated.

Results: Maximum participants were 26-30 years of age and 22(66.7%) were males. Maximum participants, 19(57.6%) were having less than five years work experience. Post intervention scores improved for six out of twelve sessions - rational use of antimicrobials, infection prevention and control for limiting AMR, monitoring the use of antimicrobials in Nepal, effectiveness of various programs to prevent AMR, familiarizing with microbes to tackle AMR, and role of government, media and other organizations for preventing AMR.

Conclusions: Excessive use of antimicrobials can lead to problems like AMR. The three-day workshop was effective in increasing the KAP scores of the participants and may lead to more rational use of antimicrobials.

Introduction

Increasing antimicrobial resistance has become a global concern as resistant micro-organisms lead to prolonged illnesses along with greater treatment costs and higher mortality. Factors, over the counter use of antimicrobials can contribute to resistance which is common in Nepal. ^[1] In a country like Nepal, the implementation of the existing antibiotic use guidelines is difficult. ^[2] Factors contribute to irrational use of antimicrobials including self-medication, irrational prescribing and dispensing. ^[3,4]

Professionals involved in healthcare delivery are important stakeholders towards promoting rational use of antimicrobials. Training programs can strengthen the capabilities of the participants towards the rational use of these medicines.

Materials And Methods

Ethical approval was obtained from the IRC of the medical college with a reference number 2075/76/76.

Study design and study area

This was a pre post interventional study conducted among the workshop participants. There were 33 participants. All participants agreed to be administered the pretest questionnaire at the time of registration on day one. After completion of each session, a feedback questionnaire was provided to obtain the participant's opinion about the session. KAP scores were again measured at the conclusion of the workshop.

Selection of participants

The participants were selected on first come first served basis. A letter for call for participants was sent to various medical and paramedical colleges for nominating and sending participants for this workshop. The participants were divided in three groups based on their academic backgrounds. The groups included healthcare professionals like medical professionals including doctors, nurses and interns, dental doctors, pharmacy professionals and academicians.

Resource Persons of the workshop

The resource persons (facilitators) from various institutes were selected on the basis of their expertise. One resource person was Professor and Head, Department of Pediatrics and Chair, Medical Education Department, from a Medical College who facilitated a session on Medical ethics. Another resource person was an Intensivist from Intensive Care Unit (ICU) of Tribhuvan University Teaching Hospital who presented on antimicrobial stewardship. Professor and Head, Department of Microbiology, Nepal Medical College facilitated a session on infection control and tackling AMR and another session on 'To know thy enemy'. Program Director, Global Antimicrobials Resistance Partnerships (GARP) Nepal talked about the effectiveness of ongoing antimicrobial resistance (AMR) activities in Nepal. A senior drug administrator from Department of Drug Administration (DDA) discussed monitoring the use of antimicrobials and also on the role of media, government and NGOs to combat AMR.

An associate professor from Department of Clinical Pharmacology and Therapeutics from Nepal Army Institute of Health Sciences facilitated a session on the rational use of antimicrobial agents and also on the role of microbiology laboratory to contain AMR. An associate professor, Department of Clinical Pharmacology and Therapeutics, of a Medical College facilitated the session on various strategies to

reduce AMR and the roles of healthcare professionals (HCPs) to combat AMR. The details for the sessions has been added as “Additional file 2”.

Data collection tool

A structured questionnaire to measure knowledge, attitude and practice (KAP) was developed by consulting relevant literature. It was validated after iterative discussion with the content experts.

The KAP questionnaire was divided into thirteen sections. The first section contained the demographic information of the participants followed by the 12 sections which contained a set of three statements related to each session of the workshop.

The questions related to the demographic section were the participant’s age, gender, ethnic group, place of residence, work experience and area of work. A 5-point Likert scale was used to obtain the degree of agreement with the 36 statements.

The feedback questionnaire contained information about the name of session followed by the respondent’s degree of agreement using a 5-point Likert scale for seven questions related to the particular session. The statements were about the clarity of the objectives, relevance of the examples used in the sessions, relevance of the case scenarios used in the sessions, satisfactory roles of the facilitators, importance of the sessions for the future practice of the participants, friendly atmosphere and also about the satisfaction with group dynamics during the group work. There was an overall grading for the individual session rated out of 10 by the participants in addition to the responses made using the 5-point Likert scale. The response from the participants were categorized as, 1 = Strongly disagree with the statement, 2= Disagree with the statement, 3= Neutral, 4= Agree with the statement, 5= Strongly agree with the statement. There was also space provided for free-text comments by the participants. The questionnaire used for data collection has been added as “Additional file 1”.

Statistical analysis

The responses obtained from the pretest as well as posttest were coded and entered in SPSS Version 21 software. Similarly, the data from feedback were also coded, entered and analyzed using SPSS Version 21 (SPSS Inc., Chicago, IL, USA). Difference in the mean scores towards various questions before and after the workshop were analyzed using appropriate statistical tests. A p-value of <0.05 was considered statistically significant.

Results

Demographic parameters of participants

Table 1 describes the demographic parameters of the study participants. All workshop attendees participated in the study. Maximum participants 16(48.5%) were from the age group of 26-30 years. Similarly, 15 (45.5%) were from 20-25 years and 1 (3%) from 30-40 and 40-50 years of age groups

respectively. Maximum participants 22(66.7%) were males. Brahmins 14(42.4%) were the most common ethnic/caste group. Majority of participants 19(57.6%) were having less than 5 years of work experience. Professionally 15(45.5%) participants were medical professionals followed by pharmacy professionals 9(27.3%).

Table 1: Demographic characteristics of the respondents (n = 33)

Variables	Frequency	Percent
Place of residence		
Kathmandu	24	72.7
Outside Kathmandu	9	27.3
Ethnicity of the respondents		
Brahmin	14	42.4
Newars	12	36.4
Chetri	4	12.1
Others	3	9.1
Work experience		
Less than 5 years	19	57.6
5-10 years	7	21.2
More than 10 years	7	21.2
Professional area		
Medical professionals	15	45.5
Pharmacy Professionals	9	27.3
Academicians	3	9.1
Interns	5	15.2
Others	1	3

Session wise analysis based on the participant's responses

Table 2. shows the session wise analysis based on the participant's responses. The post intervention scores improved significantly for six out of twelve sessions - rational use of antimicrobials, infection prevention and control for limiting AMR, monitoring the use of antimicrobials in Nepal, effectiveness of various programs to prevent antimicrobial resistance, know thy enemy, role of government, media and NGOs for preventing antimicrobial resistance. The table shows the significant improvement in the scores after the intervention. Significant differences between the pre and post session scores are shown in bold.

Table 2: Mean KAP scores before and after different sessions (n=33)

S. No.	Items	Mean scores		P Value
		Pre	Post	
1.	Ethical prescribing	9.66	9.21	0.121
2.	Rational use of antimicrobials	10.48	12.00	0.023
3.	Antimicrobial stewardship program	12.75	12.81	0.882
4.	Infection prevention and control for limiting AMR	10.30	11.60	0.003
5.	Role of healthcare professionals towards promoting safe use of antimicrobials	13.54	13.93	0.273
6.	Prescribing practices of antimicrobials in Nepal	13.15	13.27	0.793
7.	Monitoring the use of antimicrobials in Nepal	7.72	10.63	<0.001
8.	Strategies to prevent antimicrobial resistance	13.24	12.27	0.125
9.	Effectiveness of various programs to prevent antimicrobial resistance	11.57	13.12	<0.001
10.	Role of microbiology laboratory in definitive treatment of infections and containment of AMR	10.33	9.84	0.190
11.	Know thy enemy	12.21	13.48	0.004
12.	Role of government, media and NGOs for preventing antimicrobial resistance	12.48	14.00	0.003
13.	Total	141.24	142.45	<0.001

Figure 1. shows the mean total participant scores regarding individual sessions

Participants also provided an overall rating to the session on a scale of 1-10 (1= poor, 10, excellent). Participants have given a score of 7.5-9.3 on overall feedback of the session. Figure 2 shows overall rating for the individual session by the participants.

Figure 2 shows overall rating of participants about different sessions

Discussion

Antimicrobials are an effective remedy for many diseases. Emergence of resistance to antimicrobials is a serious issue worldwide, especially, in a developing country like Nepal. ^[6] Many factors play a role in development of AMR, like self-medication, irrational prescribing and overuse and under use of antimicrobials. ^[7,8] A study showed that 42% of people did not consult doctors while using antimicrobials, whereas 19% of the participants deferred to the advice of pharmacist for taking antimicrobials. ^[9] Several studies have indicated that there is an urgent need to limit the availability of antimicrobials in both developing and developed countries. WHO has been advocating a Global Strategy for Containment of Antimicrobial Resistance through bottom up and bottom down approaches. Collaborative approaches at the local, regional and national level using community mobilization approach is the bottom down approach.

Educational interventions have proven effective for promoting rational use of antimicrobials.^[10] Awareness programs for the public should also be created and implemented.^[11] Healthcare professionals should also be regularly updated about appropriate use of antimicrobials. Several studies have shown that medical students have inadequate knowledge, attitude and practice regarding use of antimicrobials. Inclusion of specialized courses on antimicrobials can strengthen their understanding of antimicrobials and their use.^[12,13] Sessions in this workshop were targeted to enhance knowledge and understanding about rational use of antimicrobials and the role of healthcare professionals.

Judicious use of antimicrobials is important as the number of antimicrobials are very few and limited. The workshop also had a session on antimicrobial stewardship. This concept enables participants to appreciate the principles behind the use of antimicrobials only when it is necessary.^[14] Antimicrobial stewardship also enhances the understanding about the right choice of antimicrobials to the right patients. Studies have shown that stewardship benefits patients as it protects them from unnecessary adverse drug reactions by the antimicrobials. Healthcare professionals should use antimicrobial therapy based on the details of patients, and infecting organisms. Studies have shown that educational interventions should be conducted to modify the use of antimicrobials. This can also save money, improve the outcomes and slow the development of resistance.^[15]

The workshop also highlighted the importance of infection prevention and control for limiting AMR. Methods for tackling the issue of AMR were discussed. The importance of hand hygiene, techniques for prevention of infection, techniques for screening and decolonization were described. Few video clips about infection transmission in the intensive care unit were also shared with the participants. This session helped to understand the importance of hygiene and infection control measures to prevent the spread of infection. Everyone should be accountable for minimizing the threat of AMR at their own level using techniques from simple hand washing to improving antimicrobial use.

Role of media and government is also crucial towards promoting rational use of antimicrobials. Media can be used to educate people through various methods like, radio and TV programs, road shows, street dramas, posters and leaflets for sharing information about rational use of antimicrobials. There was a session about the role of government and media. A study has shown improvements in knowledge and awareness among the schoolteachers and journalists towards rational use of medicines via a similar type of workshop in Nepal.^[16]

Strategies using strong surveillance system for antimicrobials and using vaccines for infectious diseases and promoting good hand hygiene can also be a measure to reduce the prevalence of AMR. Regular updates in the curriculum for medical and para medical students can be an important strategy for the same.^[17]

A study from Nepal has stated that prevention and control measures should be taken by the government of Nepal.^[17] Government should implement the antimicrobials guidelines and the national plan to reduce AMR strictly. Appropriate use of antimicrobials in animals has also to be promoted.^[17,18] Strategies and

policies should be included to promote nationwide AMR surveillance programs and to increase awareness among various stakeholders and consumers on AMR issues. Irrational use of antimicrobials and the illegal import of antimicrobials along with other medicines has to be controlled strictly. One of the sessions focused on the effectiveness of various ongoing programs for preventing antimicrobial resistance. Emphasis should also be given towards immunization and vaccination programs for prevention and control of diseases. Monitoring the use of antimicrobials were also discussed and the importance of a coordinated programs for surveillance initiatives on antimicrobial resistance were highlighted.

Awareness and educational intervention should also be targeted to promote one health approach which advocates responsible use of antimicrobials in human, animals and also in the environment .^[19] Importance of hand hygiene and appropriate use of antimicrobials in animals and agriculture should be emphasized. All stakeholders should act responsibly at their level to fight against the global problem of AMR. ^[16,17]

Periodic evaluation of treatment guidelines should be done for the safe use of antimicrobials.

Feedback of the participants were quite satisfactory as all of them have rated the sessions as 4 and above and the overall scores were also very good for the sessions. The participant's individual feedback scores and the overall feedback scores were better for the session dealing with rational use of antimicrobials (4.9/5); (9.3/10) followed by the session on role of microbiology lab in definitive treatment with the scores as (4.7); (8.8/10).

The feedback is very important for educators for assessing the trainee's level of understanding and the possible impact of different sessions. Curriculum should be tailor made for all healthcare professionals involved in daily patient care practices. ^[20] Participant feedback was obtained regarding a three-day workshop on social issues in use of medicines. ^[21] The median total scores for most sessions was around 21 out of 25. The scores for certain sessions were low. Problems with accents of the facilitator may have been responsible as there was an international group of resource persons. The venue also did not have internet connection.

Strengths and limitations

The authors successfully conducted a three-day workshop for healthcare professionals on strategies to reduce antimicrobial resistance and promote their rational in a Nepalese medical college. Participant feedback was positive and the knowledge, attitude and practice scores of participants increased significantly after the workshop. Small sample size and a single centred study is a limitation for this study.

Conclusion

Excessive use of antimicrobials can lead to problems like antimicrobial resistance. This issue has to be dealt with the team efforts of various stakeholders. The post intervention scores improved for six out of twelve sessions - rational use of antimicrobials, infection prevention and control for limiting AMR, monitoring the use of antimicrobials in Nepal, effectiveness of various programs to prevent antimicrobial resistance, familiarizing with microbes to tackle AMR, and role of government, media and NGOs for preventing antimicrobial resistance. Continuous medical education programs are recommended for a regular update on the use of antimicrobials. All stakeholders have to act responsibly towards containing the problem of AMR.

Declarations

Ethical approval was obtained from the IRC of the medical college with a reference number 2075/76/76.

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Competing interests: The authors declare no competing interests.

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Figures

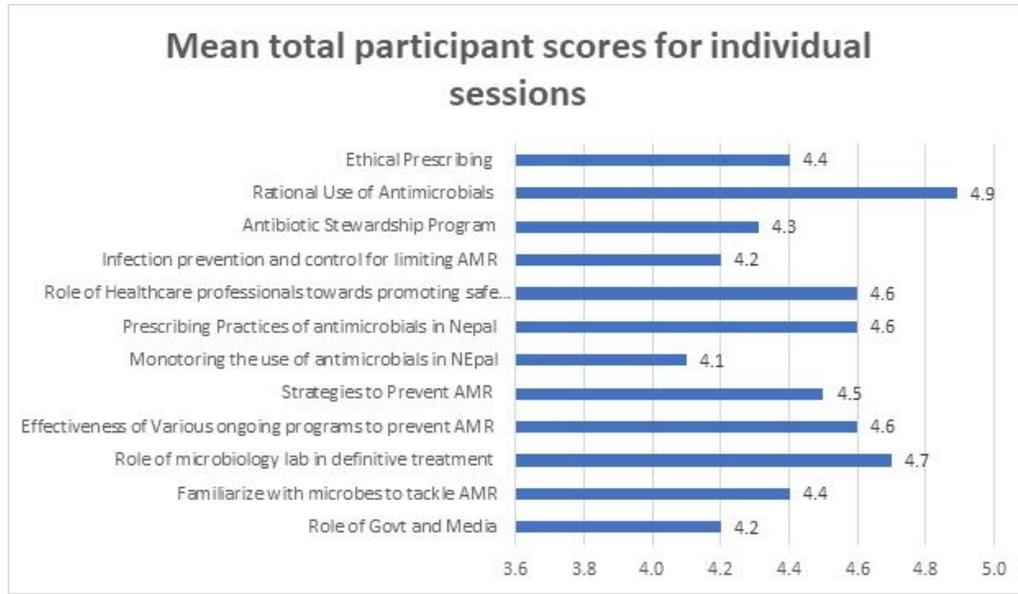


Figure 1

The mean total participant scores regarding individual sessions.

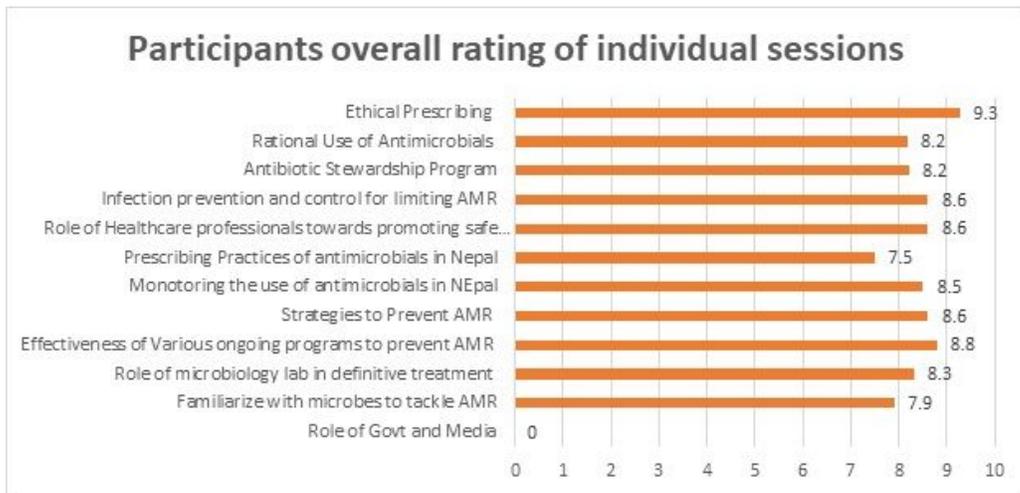


Figure 2

Figure shows overall rating for the individual session by the participants.

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