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Antibiotics in the times of COVID 19'- A Mixed-Methods study among patients attending OPD of an Urban Health Centre of West Bengal

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ABSTRACT

Introduction: Antibiotic Resistance has become a global threat attributable to the overuse and misuse of Antibiotics and exacerbated by the ongoing COVID19 pandemic. **Objective:** Present Mixed Methods study, envisages finding out the knowledge and practice regarding Antibiotic usage and exploring changes if any brought about due to the pandemic among patients attending OPD of an Urban Health Centre in Kolkata. **Method:** Study was conducted from May to July 2021, in the urban field practice area of the institute. The quantitative component was evaluated by interviewing 200 patients using a pretested questionnaire and the Qualitative component was evaluated up to the point of data saturation in 3 FGDs. SPSS was used to analyze the Quantitative component, while the Qualitative component was analyzed thematically. **Results:** Among the 200 participants, self-medication with Antibiotics was seen in 74.0%; 26.0% had satisfactory Knowledge regarding Antibiotics and their use, whereas only 19.5% had satisfactory Practice regarding the same. Education and Health Literacy Score were significant predictors associated with unsatisfactory Knowledge and Practice regarding Antibiotic usage patterns. Economic constraints, Lack of transportation during the lockdown, and fear of institutional quarantine were some of the major factors which further contributed to Antibiotic misuse during the COVID19 pandemic. **Conclusion:** Advocacy for increasing health literacy, overall literacy status, and awareness regarding the perils of Antibiotic Resistance using appropriate IEC by health providers would be beneficial in the long run to prevent Antibiotic resistance. With that said, strict government regulations along with curbing the fallacies in the health system would further aid in making people use Antibiotics wisely.

Keywords: Antibiotics, Antibiotic Resistance, Knowledge, Practice, COVID 19, Intervention Strategies

Introduction

The World Health Day global theme of 2011 stood for – "Combat Drug Resistance! No action today, no cure tomorrow"[1]. That being said, the cases of Antimicrobial Resistance dates back to 1940s, merely 20 years after the discovery of the world's first Antibiotic; Penicillin. In the Noble lecture of 1945, Alexander Fleming had stated the following:

> *"The time may come when penicillin can be bought by anyone in the shops. Then there is the danger that the ignorant man may easily under dose himself and by exposing his microbes to non-lethal quantities of the drug make them resistant" .* [2)]

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Thus, AMR had been predicted in the past and since then, the rapid emergence of resistant bacteria worldwide has been a great threat to mankind. This gruesome situation is the result of the indiscreet use of Antibiotics over a long haul. Apropos, WHO has declared AMR as one of the top 10 global public health threats facing humanity.[3]

A review on AMR estimated that 7,00,000 deaths each year globally might be due to AMR bacterial infections[4]. An article on global increase and geographic convergence in Antibiotic consumption between 2000 and 2015 showed that the global Antibiotic consumption increased by 65% in the span of 5 years, i.e; from 21.1 to 34.8 billion Daily Defined Doses (DDDs). The Antibiotic consumption increased by 114% as a whole, out of which 77% was contributed by the LMICs; thus, making them the primary drivers of rise in global Antibiotic consumption.[5]

It has been seen that in the European Union, Antibiotic resistance causes 25,000 deaths per year; and in Thailand, 38,000+ deaths per year [3]; thus, providing a major contribution to the global burden.

Furthermore, a study conducted in South India, showed awareness among the public about infections, antibiotics and their indications, to be minimal[6]; which indicates an urgent need for intervention for this problem. Similarly, a study conducted in New Delhi on, knowledge and behaviour of consumers towards the non-prescription purchase of antibiotics indicated retail pharmacies to be the first point of consultation for common ailments. Consumers' knowledge of Antibiotic use and about Antimicrobial resistance was also found to be low, they used old prescriptions, and bought Antibiotics OTC to save time and money.[7]

It is also noted that India has some of the highest AMR rates[8] among bacteria that commonly cause infections in the community and healthcare facilities, and at 12.9×10^9 units of antibiotics consumed in 2010, India has been the largest consumer of antibiotics for human health.[9]

Further aiding to the problem is the COVID 19 pandemic; as studies have shown that despite the viral nature of the infection, Antibiotics have been frequently prescribed to patients with the disease; largely due to suspected bacterial co-infections[10]. A study conducted on clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China revealed that 95% of the patients received antibiotics[11]. Therefore, AMR in terms of bacterial infections is escalating stealthily along with the ongoing pandemic. According to a CDC report, more than 29,400 people died from antimicrobial-resistant infections during the first year of the pandemic[12]. This might have been the result of a compromise in promoting Antimicrobial stewardship programmes due to worldwide crisis of the pandemic and the restrictions it bought along with it. As the infection was of unknown nature, so was its treatment; hence it caught the world off guard and led to a number of issues getting jeopardized in the quest of its cure.

Since studies have been very limited in India, a surge of research pertaining to the situation is necessary to identify the cause of the problem. Self-medication with Antibiotics and general practice regarding its use in the common people of the society needs to be known, in order to deal with the problem effectively.

Thus, this study intends to find the prevalence of self-medication with Antibiotics in addition to knowledge, practice and usage pattern regarding the same in an urban setting of Kolkata; along with the effect of COVID 19 pandemic on it.

Materials and Methods

A Cross-sectional study with a Mixed-methods design (Convergent Parallel design) was conducted in patients between the age of 18 to 60 years, attending the OPD of urban field practice area of the institute; in a span of 3 months (May 2021 to July 2021). Patients who had not given written informed consent and extremely sick patients were excluded from the study.

Sampling:

A Systematic review and meta-analysis study which included a total of 11 cross-sectional studies, involving 5080 participants, conducted in LMICs from Asia showed a pooled prevalence of self-medication with Antibiotics to be 78% [(4)]. With that, considering p= 0.78 and an absolute error of precision of 7.5%; the minimum sample size estimated using Chocran's formula was 117.19. As systematic random sampling was done, a design effect of 1.5 was taken and the sample size thus calculated was 175.79. Further taking 10% non-response rate, the final Sample Size came out to be 200, for the Quantitative part.

The qualitative part was evaluated by 3 Focus Group Discussion each consisting of 6-8 individuals; up to the point of data saturation. This was done to explore the aspect of COVID 19 pandemic on the use of Antibiotics, as this remained unexposed in the quantitative part.

The 200 participants for the quantitative evaluation were selected by systematic random sampling. A total of 20 participants were interviewed on an average, in a span of 10 days. The list of patients attending the OPD was obtained from the counter. On an average 100 patients between the age of 18 to 60 years, attended the OPD every day. Taking that into consideration we obtained a sampling interval of 100/20= 5; hence, every 5th patient (obtained by random number table) attending the OPD was interviewed.

The participants lying between the age groups of 18 to 60 years attending the OPD, who were previously evaluated for the quantitative part, were considered for the FGDs of the qualitative part, and were selected by purposive sampling.

Data Collection, Study tools and Parameters used

The quantitative part was evaluated by face-to-face interview. A predesigned, pretested structured questionnaire translated in the local languages of Bengali and Hindi was developed. The questionnaire aimed at assessing the participants for the following:

(a) Socio-demographic characteristics- It comprised of Age, Gender, Caste, Religion, Socio-economic status, Level of education and Occupation.

(b) Knowledge regarding Antibiotic use- It was assessed by 10 items questionnaire. The first 2 questions were not considered for evaluation; they were used for getting the participants acquainted with the upcoming questions and for further exploration. Every correct response to a question was awarded a positive mark of +1; and an incorrect response was awarded zero. A score above the 2nd quartile (i.e; 50th percentile) was taken as the cutoff for satisfactory knowledge. The minimum score attainable was 0 and the maximum score attainable was 8. The Cronbach's alpha value was >0.5 for knowledge questionnaire.

(c) Practice regarding Antibiotic use- It was assessed by a 9-item questionnaire. 3 questions were kept open-ended for descriptive exploration. "All or None" was applied for the rest of the 6 questions here i.e; a participant was considered to be having a satisfactory practice only if all the 6 questions were responded with a correct answer. Minimum and maximum attainable scores were 0 and 6 respectively. The Cronbach's alpha value was >0.8 for practice questionnaire.

The Cronbach's alpha value was >0.7 for Knowledge and Practice combined.

(d) Health Literacy Score- It was assessed by the Indian Version of the HLS-EU-Q16 questionnaire [(13)]. It has a total of 16 questions, arranged on a 4-point Likert scale. To score the HLS-EU-Q16, the categories "very difficult" and "difficult" of each item are scored as 0, and the categories "easy" and "very easy" as 1, yielding a simple

sum score ranging between 0 and 16. A score of 0–8 is considered as inadequate HL, a score between 9 and 12 as problematic, and 13 or more as sufficient.

The qualitative part was evaluated by conducting Focus Group Discussions (FGD). Data saturation was noted at the 3rd FGD. Each of the 3 FGDs consisted of 8,9 and 8 participants respectively. The 3 FGDs were conducted with the help of a pre-designed, pre-tested, semi-structured interviewer guide. The guide was pre-tested by conducting mock FGDs among the non-medical staff of the health center. The guide consisted of open-ended questions, which gave the participants enough opportunities for responses. The questions in the guide intended on extracting the pattern of use of Antibiotics during the COVID 19 pandemic and their general awareness regarding the same. Suggestions were also invited from the participants in order to help the society as a whole to curb the problem. The audio recorder was used with due permission of the participants and each FGD was duly recorded. Field notes were taken simultaneously. On an average 40 mins were utilized in each of the 3 FGDs. Considering the COVID situations, all the participants were made to sit in a circle keeping distance of 6 feet in between each one of them. They were each given N95 masks at the time of discussion, and compliance was maintained with the COVID guidelines.

Data Analysis

Quantitative data were analyzed by Microsoft Excel 2016 and SPSS software (16 versions). Descriptive statistics were used to signify the Dependent variables (Knowledge and Practice regarding Antibiotic use) along with the independent variables (Socio-demographic Characteristics, Presence of Disease, and Health Literacy Score). Univariate Logistic Regression Analysis was used to denote significant relation ($p<0.05$) between the Dependent and Independent variables. Independent variables with p value <0.25 in the univariate model, were included in the final multivariable models.

Qualitative data after being transcribed in a verbatim format using Microsoft Word 2016, were analyzed manually with the help of thematic analysis. Rigorous reading of the transcripts was done in order to attain a thorough understanding of the matter. From the transcripts, codes were generated and grouped into various subthemes. Further, the subthemes were grouped under four major themes, which could be deduced by the similar implications deciphered by them.

Ethical Approval

The institutional Ethics Committee approved the study protocol. Subject Information Sheet was provided to each of the participants in their local language and written informed consent was taken from each one of them. Anonymity was maintained throughout the study in accordance with the Declaration of Helsinki.

Results

Socio-demographic characteristics of the Study Participants

Among 200 study participants interviewed for the quantitative part, the mean age was 39.6 ± 12.9 years with the dominancy of females constituting to126 (63.0%). Hinduism was the predominant religion;155 (77.5%). Of the total, 145 (72.5%) participants belonged to the Other (General) caste. Secondary and below level of education was noted in 109 participants (54.5%). The majority of the participants were housewives, 71 (35.5%). Most of the participants i.e; 106 (53.0%), were below Socio-economic class III of modified BG Prasad scale 2020.

Health Literacy Status

In this study; 73 (36.5%) participants had an Inadequate Health Literacy Score of (0-8). Forming a majority 81(40.5%) study participants had a Problematic Health Literacy Score of (9-12). Only 46 (23.0%) participants had a Sufficient Health Literacy Score of (≥13). [Minimum=0, Maximum=16, IQR=5].

Knowledg*e regarding Antibiotic use*

Knowledge Score [total range= 1 to 8] showed a median IQR (25-75) of 6 (5-7). Of the total, 52 (26.0%) participants had Satisfactory Knowledge regarding Antibiotic use.

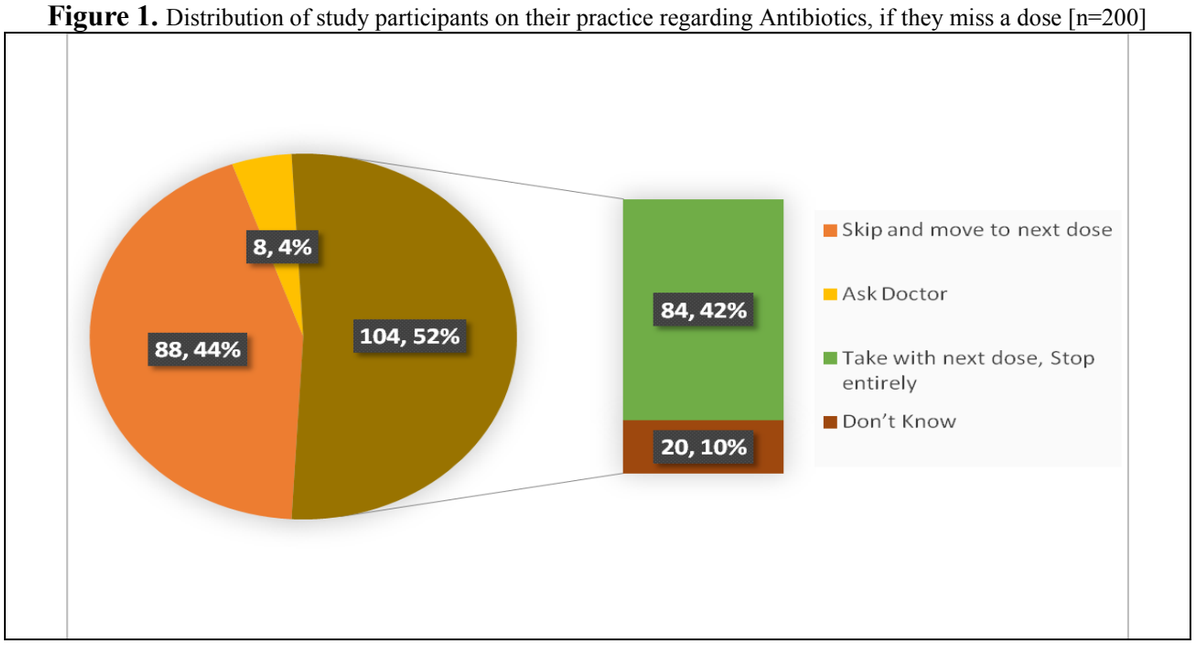
Education level of above primary (aOR:3.0; 95% C.I: 1.3-7.6), Problematic Health Literacy score (OR:6.3, 95% C.I: 2.5-16.7) and Sufficient Health Literacy score (OR:2.6, 95% C.I: 1.1-6.5) were significantly associated with Knowledge on Antibiotic use in the adjusted multivariable model. See Table 1.

The model was fit to use as per insignificant P (>0.05) in the Hosmer-Lemeshow test and significant Omnibus Tests of Model Coefficients (P < 0.001). Independent variables in this model retained significance with an explained variance of 20%. Factors in this model correctly predicted 76.5% of the variance of Knowledge on Antibiotic use.

Practice regarding Antibiotic use

Practice scores [total range= 0 to 6] showed a median IQR (25-75) of 5 (4-5). 39 (19.5%) participants had Satisfactory Practice regarding Antibiotic use. Self-medication with Antibiotics was seen in 74.0% of the them. In response to the open-ended question of, 'What do you do if you have missed a dose of Antibiotic?'; 104 (52.0%) participants came up with incorrect answers, stating 'Take it along with the next dose or Stop the course entirely' and 'Don't know'. (Fig.- 1).

Figure 1. Distribution of study participants on their practice regarding Antibiotics, if they miss a dose [n=200]



Female gender (aOR:2.3; 95% C.I: 1.0-5.2), Education level of above primary (aOR:2.7; 95% C.I: 1.1-6.9) and Problematic Health Literacy score (aOR:2.8, 95% C.I: 1.2-7.1) had a significant association with Practice regarding antibiotic use in the adjusted model. See Table 2 for a more detailed representation of the logistic regression results.

The model was fit to use as per the insignificant P (>0.05) in the Hosmer-Lemeshow test and significant Omnibus Tests of Model Coefficients (P <0.001). Independent variables in this model retained significance with an explained variance of 8%. Factors in this model correctly predicted 80.5% of the variance of Practice regarding Antibiotic use.

Table 1: Factors associated with Knowledge on Antibiotic use- Logistic Regression Analysis (n=200)

Socio-demographic characteristics (N=200)	Total		Knowledge				OR (95%CI)	p-value	aOR (95%CI)	p-value
			Unsatisfactory		Satisfactory					
	No.	%	No.	%	No.	%				
Education Status										
Primary & below	121	60.5	64	52.8	57	47.2	1 (Ref.)	0.006	1 (Ref.)	0.097
Above Primary	79	39.5	26	32.9	53	67.1	2.3(1.3-4.1)		1.8 (0.9-3.60	
Health Literacy Score										
Inadequate (0-8)	73	36.5	39	19.5	34	17.0	1 (Ref.)	0.008	1 (Ref.)	0.781
Problematic (9-12)	81	40.5	38	19.0	43	21.5	0.3(0.2-0.7)		1.1(0.5-2.2)	
Sufficient (≥13)	46	23.0	13	6.5	33	16.5	0.4 (0.2-0.9)	0.041	1.9 (0.8-4.8)	0.126
Hosmer-Lemeshow test statistic = 0.078, Cox and Snell's R2 = 0.084 & Nagelkerke's R2 = 0.112										

Table 2: Factors associated with Practice regarding Antibiotic use- Logistic Regression Analysis (n=200)

Socio-demographic characteristics (N=200)	Total		Knowledge				OR (95%CI)	p-value	aOR (95%CI)	p-value
			Unsatisfactory		Satisfactory					
	No.	%	No.	%	No.	%				
Education Status										
Primary & below	121	60.5	104	85.9	17	14.1	1 (Ref.)	0.018	1 (Ref.)	0.004
Above Primary	79	39.5	57	72.1	22	27.9	2.4 (1.2-4.8)		3.6(1.5-8.8)	
Health Literacy Score										
Inadequate (0-8)	73	36.5	62.0	84.9	11	15.1	1 (Ref.)	0.792	1 (Ref.)	0.389
Problematic (9-12)	81	40.5	70.0	86.4	11	13.6	0.9(0.4-2.2)		0.6 (0.2-1.7)	
Sufficient (≥13)	46	23.0	29.0	63.0	17	37.0	3.3 (1.4-7.9)	0.008	3.2 (1.1-9.5)	0.032
Hosmer-Lemeshow test statistic=0.118 , Cox and Snell's R2 =0.158 & Nagelkerke's R2 =0.252										

A qualitative exploration of the pattern of Antibiotic use, in view of the COVID 19 pandemic:

Of participants among whom, 3 FGDs were conducted, 56% were females. The majorities were Hindu; 56% of them were educated up to class 8 and the majority belonged to the socio-economic class 3. The health literacy score was inadequate for 28%; problematic for 44% and sufficient for only 28% of the participants.

Information obtained from the participants after conducting the 3 FGDs was assembled into codes. The codes were then grouped into 9 subthemes, which were further narrowed to 4 major themes which were:

(1) **Rationale for Self-medication**- Convenient procurement of antibiotics without RMPs prescription, Misconception of Government health facilities being exclusively dedicated to COVID 19 patients, and Fear of institutional Quarantine; were some of the major factors under this theme.

Most of the participants were under the misconception that Antibiotics can be taken as per the pharmacist's advice.

"I have taken the medicine after Pharmacist's advise"- 42-year-old home-maker, FGD 2

"They will catch and take me to the quarantine center if I consulted a Doctor in case of fever, that's why I took the medicines on my own." – 35-year-old auto driver, FGD 3

(2) **Economic constraints**- Due to the lockdown, lack of public transport and unaffordability of private practitioners played a significant role in self-medication with Antibiotics.

"Public transports were shut and the private transports charged a lot of money, hence we went to the nearby pharmacies"- 35-year-old home-maker, FGD 1

"The nearby Doctor charges quiet high, hence I decided to visit the pharmacy directly" – 55-year-old widow, FGD1

(3) **Abrupt discontinuation (Causes)-** Lack of awareness about the importance of adherence to Antibiotic courses was a predominant factor in this theme.

"Antibiotics can be stopped when one feels fine"- 35-year-old graduate, FGD 2

"Nothing bad can happen by not following the course of the medicine, I leave the medicine once I feel fine".- 42-year-old auto driver, FGD 3

A total of 20 participants of the 25 participants from the 3 FGDs had a similar belief.

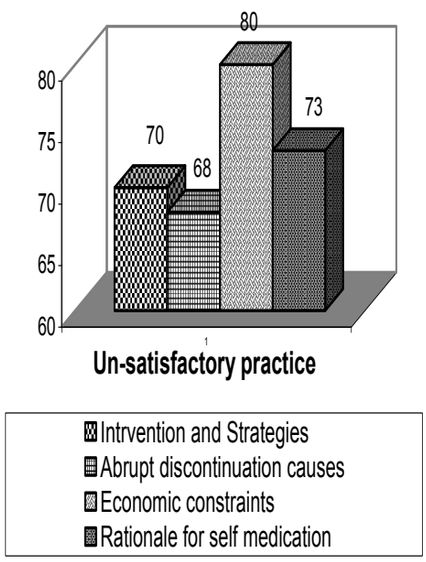
(4) **Interventions and Strategies**- Most of them were of the idea that government should come up with strict guidelines for curbing this issue. With that said they suggested for Policies be implemented to stop the sale of OTC medicines, the Deployment of 24 hours doctor service at the nearby government health facilities, and Extensive advertisement campaigns be carried on by the authorities.

In accordance with this, a 62-year-old retired school teacher from FGD 3 was quoted as saying;

"Government can run extensive advertisements by broadcasting short understandable videos on moving vehicles, in localities."

"Doctors should be available 24×7 in nearby health centers so that we don't have to travel far."- 45-year-old businessman, FGD 2

Table 3: Joint Display Analysis of Satisfactory Knowledge & Practice with pattern of Antibiotic use

Quantitative Score showing the percentage of participants with Un-satisfactory Practice.	Qualitative exploration of pattern of Antibiotic use, in view of the COVID 19 pandemic.	Interpretation
	**Rationale for self-medication-** Easy availability of OTC medicines, fear of institutional quarantine, and conjecture of Government health facilities being exclusively dedicated to COVID 19 patients led to them buying Antibiotics without a doctor's prescription	The rampant selling of OTC Antibiotics, explains the hike in practice scores. The fear of institutional quarantine and havoc created by COVID 19 further worsened the problem.
	Economic Constraints- Lockdown which led to a lack of public transport. High cost of private vehicles and high fees of private practitioners.	As COVID 19 caused a monetary setback, money became a major factor in driving people to avoid fees on doctors and travelling.
	Abrupt discontinuation-Causes Side effects, lack of knowledge on the complete course of antibiotics, being ignorant of the importance of medicine adherence	General discomforts of weakness and gastric complaints led to the abrupt discontinuation of Antibiotics as participants were unaware of the perilous effects of Antibiotic Resistance.
	Intervention and Strategies- Policies to stop the sale of OTC medicines, Deployment of 24 hours doctor service at the nearby government health facility and Extensive advertisements were some of the ways suggested by the participants to combat the problem.	As COVID 19 led to its detrimental effects nation-wide, public advertisements were of utmost necessity to spread awareness regarding Antibiotics and the COVID 19 disease as a whole as majority of the participants believed that government facilities were solely dedicated to COVID 19 patients.

Discussion

In 2010, India was the world's largest consumer of antibiotics for human health at 12.9 x 109 units (10.7 units per person). The next largest consumers were China at 10.0 x109 units (7.5 units per person) and the US at 6.8 x109 units (22.0 units per person). [9]

This cross-sectional study aimed at finding the prevalence of self-medication with Antibiotics and recognizing the Knowledge and Practice regarding its use, in the slum-dwelling urban population. These populations tend to have easy access to the pharmacies and are also more susceptible to various common diseases, hence becoming the vulnerable

population[14] to the perils of self-medication with antibiotics. The study further traversed the effect of the COVID 19 pandemic on the use of these medicines.

Various studies have been conducted keeping in mind the stakeholders and the academic population, but studies have hardly targeted the more vulnerable part of the society. Moreover, the impact of the pandemic on the sale of these easily available OTC Antibiotics still remains unexplored.

Self-medication with Antibiotics was found to be 3.31% in a study conducted in an urban population of Kerala[15], whereas it was noted to be 74.0% in this study. This can be due to the lower literacy in the slum dwelling population. Likewise, a study conducted in Pakistan showed about 30% of participants to be self-medicating with antibiotics during the pandemic[16], thus portraying the effect of pandemic on the use of antibiotics.

A study conducted in East Bangalore by Manjushree Nagraj et al.[3], elicited 13% of patients to be aware of the harmful effects of drugs as a whole[17]; whereas, in our study, only 4% of the participants were aware of the term "Antibiotic Resistance".

Of the total, 26.0% of the participants had satisfactory knowledge regarding Antibiotic use in our study, which corroborated with the results of a study conducted in Mozambique on Knowledge, attitude, and practices regarding antibiotic use; where 32.4% of the participants had good knowledge. [18]

A study conducted in the population of Boyolali, Indonesia showed that gender, age, area resident, educational level, and monthly income were significantly associated with antibiotics knowledge[19]; these findings were congruent to that of our study where, Level of Education and Health Literacy Score were significantly associated with Knowledge regarding Antibiotic use. This highlights the importance of education and the need of escalating health literacy among the population. With that said, Antibiotic awareness should be spread from the school level itself. [20]

With only 19.5% of the participants having satisfactory practice, it is seen that Knowledge is not enough, and it does not necessarily have to transcend into behavioral change, and hence, behavioral change strategies catering to our cultural context needs to be developed and implemented.

The cross-sectional study on the Boyolali population of Indonesia showed Females, urban people, people with higher levels of education, and people with higher monthly incomes had better practices in antibiotics use[19]; similar findings were seen in this study where, significant association of practice was seen with Female gender, Level of education and Health Literacy Score. This shows the importance of Education and Health literacy; and how it's strengthening can lead to a favourable change.

Health Literacy Score showed a positive impact on both Knowledge and Practice regarding Antibiotic use in this study, making it an important domain to be strengthened for the population to curb this ever-rising issue. A cross-sectional study on Public Health Literacy, Knowledge, and Awareness Regarding Antibiotic Use and Antimicrobial Resistance during the COVID-19 Pandemic, in Jordan, showed two-thirds (62.6%) of those surveyed had adequate health literacy.[21]

The Qualitative exploration of the study revealed the need for the annulment of the OTC sale of these medicines, as easy availability and cheap rates of these medicines promoted their misuse. Similar findings were revealed in a study conducted in New Delhi by Anita Kotwani et al.[5, 22]

Diving further into the problem, the COVID 19 pandemic led to a lockdown and various restrictions making these practices all the more rampant as private practitioners were unaffordable, cheap transportation was unavailable and

there were various misconceptions and fear regarding the new disease among the population. A major number of people pointed towards fear of institutional quarantine, to be a driving factor for them in taking OTC Antibiotics.

Participants came up with suggestions of strict government rules and spreading of awareness regarding the issue; which was also implicated in the previously mentioned studies and also in an article titled "Policy document on antimicrobial stewardship practices in India" by Kamini Walia et al.[4, 23]

The Joint display seen in Table 3, portrayed that COVID 19's impact on the economy of the population, became a major driving factor in the misuse of Antibiotics, further aided by the easy procurement of the medication without a prescription, and the fear of getting quarantined due to the disease. All these were a result of poor knowledge regarding the medication course, nature of the pandemic, and the functioning of the hospitals in pandemic time. Hence in this study the pandemic showed to have a detrimental effect on the already prevailing problem of Antibiotic resistance.

Although, World Antibiotic Awareness Week[24] is celebrated annually from 18th to 24th November to increase awareness of global antimicrobial resistance and to prevent further emergence and spread of drug-resistant infections; overuse and misuse of Antibiotics prevails. This can be due to the fact that most of the LMICs populations are less educated and hence tailor-made awareness programme needs to be adopted. Similar to this, India initiated the five-year National Action Plan on AMR (2017–2021)[25] which outlined priorities and implementation strategies for curbing AMR in India. Even after that, studies portrayed that many stakeholder groups such as school students, teachers, and pharmacists were not fully aware of AMR and the consequences it leads to. This bough to light the fact that Knowledge is not enough and hence WHO/Europe and the National Institute for Public Health and the Environment (RIVM) aim at developing the Guide to Tailoring AMR Strategies (TAP).[26]

In population where literacy is poor, mass media can prove to be highly effective in spreading accurate news regarding the use of these medicines in reference to the COVID pandemic and transcending behavioural changes.

Limitations of the Study: This questionnaire formulated to assess the Knowledge and Practice regarding Antibiotic use was based on recall, thus making recall bias a possibility.

Conclusion

This study revealed 80.5% of study participants as having un-satisfactory Practice, thus pointing towards the ongoing injudicious use of Antibiotics. A positive influence of Health Literacy score and Literacy status on the same was revealed, hence indicating its strengthening. Introduction about AMR at school level could also prove to be beneficial in managing the situation. Necessary steps in aiding better delivery of patient care in times of the pandemic should be considered. Most importantly mass awareness programs should be carried out in full force, in order to prevent further degradation due to COVID 19.

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