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Research Article

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Patient Knowledge and Perception about Antibiotics in Community Pharmacy

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Abstract

There is a global concern regarding the emergence of antibiotic resistance. This has warranted a behavior diagnostic study to determine what patients visiting the community pharmacy in Nausori, Fiji understand regarding antibiotics and antibiotic resistance. This was a cross-sectional survey which enrolled 200 consenting participants by convenience sampling strategy visiting the pharmacy with prescription for antibiotics from July to September 2021. A validated questionnaire was constructed for data collection. Data collected were analyzed to determine predictors of antibiotic knowledge at 5% level of significance. Findings showed that 70.5% respondents reported an average level of knowledge about antibiotics. 83.5% respondents had misconceptions that antibiotics would work on viral infections while 82% correctly identified misuse of antibiotics can result in antibiotic resistance. The age (p value 0.0005), educational level (p value– 0.000007), and whether or not the participants were studying or working in medical field (p value– 0.016) were found to be important predictors of antibiotic knowledge. The public surveyed had misunderstandings and lack of knowledge in some crucial aspects of prudent antibiotic use. Also, negative attitudes regarding rational use of antibiotics were evident. Educational interventions are required to promote rationale use of antibiotics among the public.

Keywords: Antibiotic, Antibiotic Resistance, Public Health

1. Introduction

Antibiotics have revolutionized healthcare since their introduction in 1928 [1]. Antibiotics have had a huge impact on morbidity and mortality caused by bacterial infections, rendering them indispensable in modern medicine [1]. However, their use has been supplanted by an increase in the incidence of resistance and their value to effectively treat infectious disease have been reduced in attempt to produce more effective generations of antibiotics that are very expensive and unaffordable to most people. Several million people die due to resistant infections worldwide annually [2]. In 2014, The World Health Organization (WHO) reported antimicrobial resistance (AMR) as a worldwide public health threat that requires necessary collaborative action. The Western Pacific Region, which includes Fiji, has reported the highest rate of antibiotic resistance [3]. The irrational use of antibiotics is a driving factor of antibiotic resistance (ABR).

According to the World Health Organization (WHO), rational use of medicines by patients is when they receive appropriate drugs for appropriately diagnosed health conditions, in doses that meet their individual requirements, for an adequate duration, at the lowest effective cost both to them and the society, and with appropriate information. Irrational use of medicine occurs when one or more of these conditions is not met [4]. According to the World Health Organization (WHO), more than 60% of the total antibiotics are used in the community, and nearly half of them are misused [5].

To further improve antibiotic use and contain resistance through actions such as information campaigns, it is important to have a concrete understanding of the knowledge and attitudes towards antibiotics within different groups of a population, such as age groups, education level, etc. Although antibiotics are prescription-only medicines in Fiji, it is vital that the population is empowered with knowledge on how antibiotics should be used, as well as the risk of resistance. A rise in irrational antibiotic use could be influenced by a variety of factors. Many studies have shown that public perception and knowledge of antibiotics are closely linked to non-adherence to antibiotic regimens and excessive antibiotic

use [6,7]. Factors associated with public knowledge of antibiotics have been reported to be demographic characteristics, including gender, age, race, education level, family income, place of residence, as well as other factors, such as lack of advice regarding rational antibiotic use, given by a physician [6,8-18].

In November 2015, Fiji became the first country in the Pacific to develop and launch a national plan for AMR [19]. The then recently completed AMR situation analysis in Fiji highlighted key challenges:

- Limited awareness and a lack of national comprehensive policies for AMR;
- Lack of a national surveillance systems to monitor AMR and antimicrobial use; and
- Limited regulation and implementation of health system responses to AMR [19].

The plan included the five key strategies to combat, or minimize the impact of AMR in Fiji:

- Improve awareness and understanding of AMR through effective communication, education and training.
- Strengthen nationally coordinated surveillance systems.
- Reduce the incidence of antimicrobial resistance events through improved infection prevention and control, sanitation and hygiene, and wellness measures.
- Optimize the use of antimicrobial medicines in human and animal health.
- Establish and ensure governance, sustainable investment and actions to combat AMR [19].

Public education is one of the key interventions proposed by the WHO to rationalize the use of medicines [20]. Moreover, the improvement in public awareness and understanding of issues related to antibiotics is the principal strategic objective of the WHO Global Action Plan on Antimicrobial Resistance [20]. Henceforth patient knowledge, perception and practices regarding the use of antibiotics influence the decision to seek health care, the use of antibiotics and ultimately the success of the treatment.

1.1. Statement of Problem

In Fiji, antibiotics are used for infectious illnesses such as colds and flu, according to a survey conducted by the Ministry of Health and Medical Services (MoHMS), Fiji. Awareness of the policy makers is high on antimicrobial resistance; however, the awareness in the general public is low. It was also discovered that the general public requests physicians and pharmacists for antibiotics [3]. For example, the antibiotic amoxicillin is often mistaken for a general pain reliever and high unnecessary usage has been reported [3].

The lack of knowledge and incorrect use of antibiotics can lead to ABR. Therefore, a better understanding of the existing pieces of evidence pertaining knowledge and perception about antibiotic and antibiotic resistance in the general population in Fiji is salient.

1.2. Benefits of the Study

This study will help to understand the level of patient knowledge regarding the use of antibiotics. It will identify the level of knowledge that is available at hand with the public and how more information can be disseminated to the public in the future.

1.3. Aim

To assess patient's knowledge and perception about antibiotics.

1.4. Objectives

- To assess the patient knowledge and perception through a knowledge assessment questionnaire
- To identify which groups within the population are in particular need of improved knowledge or perception
- To promote rationale use of antibiotics

2. Material and Methods

2.1. Study Design and Setting

A descriptive, cross-sectional study design was adopted for this research. The study was carried out in Life Pharmacy, Nausori, Fiji Islands from July 2021 to September 2021. Nausori is a densely populated area (57,866 residents at the 2017 census) with people from all economic backgrounds and education levels. Hence, it was easier to gain access to a good number of participants for this research.

2.2. Selection of Participants

Eligibility of participants was determined through a set of inclusion criteria which were as follows:

- Individuals should be 18 years or more in age
- Should be able to communicate and write in English
- Should present with a valid prescription for antibiotics
- Individuals should be residents of Fiji Islands

This study also included participants who came to the pharmacy to collect prescribed antibiotics on behalf of their family members or relatives.

2.3. Sampling

The sample size of this study was determined through convenience sampling by taking into consideration patients visiting the pharmacy with a prescription for antibiotics between July to September 2021. 200 participants were selected for this research considering the then covid-19 situation in Fiji. Some important factors in determining the sample size included: the number of prescriptions with antibiotics received by the designated pharmacy within a day by persons eligible to participate in this study, time, and the need for this study to offer sufficient statistical power.

2.4. Method for Recruitment of Participants

The participants for this study were selected via convenience sampling. The individuals were selected based on their eligibility and willingness to participate in this research. This sampling method was an affordable way to gather data and receive specific

feedback from individual perspectives regarding antibiotic use for this pilot study.

Using this sampling technique, all eligible patients and caregivers (age ≥18 years, Fiji citizens, visiting the pharmacies to purchase antibiotics with a prescription, and able to write and communicate in English) were invited to participate in the study. Consenting participants completed the questionnaire which was designed to achieve the study objectives.

2.5. Data Collection

Once approval had been received by the Fiji human health research ethics committee and the Life Pharmacy Nausori, the study was commenced. Strict covid- safe measures were followed during the data collection process such as:

- Maintaining 2 metre distance
- Temperature checks
- Hand sanitization
- Compulsory for all participants to wear masks
- CareFiji App installed in their mobile phones

Proper covid – 19 safety measures were followed during this research.

A separate area within the pharmacy premise was designated for the research purpose in order to maintain privacy of the patients and to follow proper covid-19 safety guidelines. Individuals who fell within the inclusion criteria were handed an information sheet by the principal investigator. The principal investigator explained the details of the study using the information sheet and the individuals were given the opportunity to ask any questions that they had regarding the research. The individuals who wished to participate were given a consent form to sign. A self – administered questionnaire was then handed to the participants to fill in. It was ensured that all questions were properly answered and if there was any doubt from the patients, it was ensured that they were clarified by the researcher.

The questionnaire was designed according to similar studies done in other countries and it was divided into three main domains. The first domain consisted of the demographic details of the participants, for instance, the age, gender, economic status. The second domain consisted of questions relating to the patient's knowledge regarding antibiotics. The participants were to write either true or false as answers to these questions. The third domain consisted of statements relating to patients' perception about antibiotics. This was accessed using a three-point scale ranging from 'Agree', 'Disagree', or 'Unsure'.

2.6. Pre-Test

A pre-test of the questionnaire was done on a small group of patients, consisting of 15 participants, to test how well the questions were understood and answered. Through the pretest, the investigator found out potential problems in the questions and hence, the questionnaire was modified accordingly.

2.7. Data Management and Analysis

All data collected were coded and stored in a computer which was password protected and only accessible by the researcher. Microsoft excel and Epi Info Software version 7 were used to analyse the data to percentages, graphs and chi - square in order to summarize and present the information collected.

The knowledge assessment test was evaluated by scoring each correct response as one (1) while an incorrect response was scored zero (O). Thus, there were 0 to 14 possible scores. The percentage distribution of the antibiotic's knowledge scores was determined and then used to classify respondents' knowledge levels based on percentiles. Those whose scores were ≤ 25th percentiles were considered to have low antibiotic knowledge while those whose scores were ≥ 75th percentiles were considered to have high antibiotics knowledge. Respondents whose knowledge scores were greater than 25th percentile but less than 75th percentile were regarded as having an average level of knowledge. The participants' perception regarding antibiotics was assessed using percentages.

2.8. Ethical Considerations

The research was only conducted once appropriate approval had been received from the Fiji National Health Research ethics and review committee, Life Pharmacy Nausori and the participants.

All data collected were used for the purpose of this study only and kept securely with the researcher. Once the participants had completed the questionnaires, it was collected by the researcher and quickly kept in a locked cupboard. The questionnaires were coded and no personal information was collected from the participants. A log register was also maintained by researcher in order to de-identify participants. The log register, containing the patient name and the unique code present on each questionnaire, was kept separate from the data and was only accessible to the researcher. The filled questionnaires, consent forms and log register were securely kept with the researcher in a locked drawer and were used for the purpose of this research only.

Strict covid-19 measures were adhered to while caring out the research. These measures included: wearing face mask, hand sanitization, checking temperature of participants, maintaining 2 metres distance and having Care Fiji app installed in their mobile phones. Proper covid – 19 safety measures were followed during this research as per Annex 8.

3. Results

A total of 200 questionnaires were distributed to the candidates who fulfilled the inclusion criteria and were willing to participate in this research. There was a 100% response rate for this research. Majority of the respondents (42%) were aged between 31 to 40 years. Of those 200 respondents, 82 were males while 118 were females. 58% of the respondents visited the pharmacy to collect the antibiotics for themselves while 42% were there to collect

medications for someone else. Highest level of education for majority of the respondents was university (65%). Most participants were employed (62%) while only 11% of them studied or worked in a medical field. Approximately two- third of the respondents were taking antibiotics for the first time, or in other words, taking the first course of antibiotics. A few (17%) of the participants knew the name of the antibiotics (Table 1).

Variable	n (%)
Age (years)	
18- 30	74 (37)
31 – 40	84 (42)
41 – 50	29 (14.5)
51 - 60	13 (6.5)
Gender	
Male	82 (41)
Female	118 (59)
Antibiotic is for:	
Self-Use	116 (58)
Someone Else	84 (42)
Education Level	
University	130 (65)
Secondary	55 (27.5)
Primary	5 (2.5)
No Schooling	10 (5)
Employment	
Employed	124 (62)
Unemployed	76 (38)
Work or study in medical field	
Yes	22 (11)
No	178 (89)
Taking antibiotics for first time or repeats	
First time	152 (76)
Repeat	48 (24)
Know which antibiotic has been prescribed	
Yes	34 (17)
No	166 (83)

N (Total number of participants) = 200

Table 1: Demographic Characteristics of Respondents

The antibiotic knowledge assessment test revealed that 11.5% of the respondents had low knowledge level and scored between 0 – 3 points while 70.5% (scored between 4 – 10 points) and 36% (scored between 11 – 14 points) of respondents had intermediate and high knowledge levels respectively (Table 2). The modal knowledge assessment score was 1 (Figure).

Level of Knowledge	Total Score	n (%)
Low	0 – 3	23 (11.5)
Intermediate	4 – 10	141 (70.5)
High	11 – 14	36 (18)

Table 2: Level of Knowledge

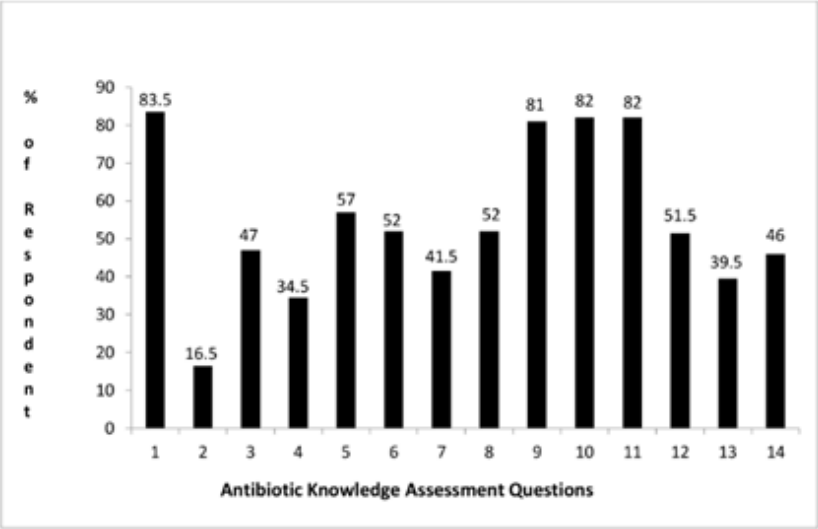

Figure: Distribution of Correct Knowledge Responses

Respondents in this study had a high knowledge in use of antibiotics for treating bacterial infections (83.5% correct response), identification of amoxicillin as an antibiotic (81% correct response), misuse of antibiotics can cause antibiotic resistance (82% correct response), and for some antibiotics, combination with alcohol can be dangerous (82% correct response). 83.5% of the respondents wrongly reported that antibiotics can be used to treat viral infections (Table 3).

Knowledge assessment question	Correct Response	n (Correct Response)	% Correct Response
Antibiotic Indications/Uses			
Antibiotics are drugs that can kill bacteria	True	167	83.5
Antibiotics can be used to treat viral infections	False	33	16.5
All infections can be cured by antibiotics	False	94	47
Antibiotics are used to relieve body pains	False	69	34.5
Antibiotics can kill the beneficial/good bacteria present on our skin and in our intestine and stomach	True	114	57
Antibiotic identification			
Paracetamol is an antibiotic	False	104	52
Prednisolone is an antibiotic	False	83	41.5
Aspirin is a new generation antibiotic	False	104	52
Amoxicillin is an antibiotic	True	162	81
Dangers associated with antibiotics			
Misuse of antibiotics can cause antibiotic resistance	True	164	82
For some antibiotics combination with alcohol can be dangerous	True	164	82

All antibiotics do not have side effects	False	103	51.5
Antibiotics administration			
Antibiotics may be effective even if you did not complete treatment	False	79	39.5
I can reduce the dose of the antibiotic by myself if I start feeling well	False	92	46

Table 3: Antibiotic Knowledge Assessment Questions and Percentage of Respondents with Correct Response

Low knowledge level was prevalent among respondents aged between 41 – 50 (51.7%) and 51 -60 (61.5%). There was significant difference in the knowledge level of the two age groups with a p – value of 0.009 and 0.0005 respectively. The educational level of respondents was found to be another demographic predictor of low antibiotic knowledge in the study population. Based on the results obtained, respondents with no schooling or education were 6 times more likely to have low antibiotic knowledge than those with primary education (Table 4).

Variable	Prevalence of low antibiotic knowledge n (%)	OR (95% CI)	P- value
Age			
18 – 30	28.4	Referent	
31 – 40	28.6	1.010 (0.505 – 2.018)	0.979
41 – 50	51.7	2.704 (1.114 – 6.562)	0.009
51 - 60	61.5	4.038 (1.185 – 13.765)	0.0005
Gender			
Male	40.2	1.597 (0.883 – 2.888)	0.209
Female	29.7	Referent	
Antibiotic is for:			
Self-Use	34.5	1.128 (0.625 – 2.034)	0.884
Someone Else	33.3	Referent	
Education Level			
University	31.5	1.843 (0.200 – 17.006)	0.109
Secondary	36.4	2.286 (0.239 – 21.886)	0.029
Primary	20	Referent	
No Schooling	60	6.0 (0.478 – 75.347)	0.000007
Employment			
Employed	33.9	Referent	
Unemployed	34.2	1.015 (0.556 – 1.854)	0.971
Study or Work in Medical Field			
Yes	18.2	Referent	
No	36.0	2.526 (0.819 – 7.788)	0.016
Taking Antibiotics for First Time or Repeats			
First time	36.8	1.750 (0.842 – 3.638)	0.133
Repeats	25	Referent	
Know the name of the antibiotic			
Yes	14.7	Referent	
No	38.0	3.548 (1.306 – 9.639)	0.001
Overall	**34.63**		

Table 4: Association of Low Antibiotic Knowledge with Demographic Considerations of Respondents

Respondents were generally found to have more positive perception towards antibiotics with results of 50% and more for majority of the dimensions studied (Table 5). The most common negative perception demonstrated by the respondents were their expectation to be prescribed an antibiotic when they suffer from flu and not taking antibiotics after they start feeling better. However, respondents demonstrated positive attitudes in taking the antibiotics according to the instruction written on the label (89%), checking the expiry dates of the antibiotics before using it (75.5%), having an understanding that unnecessary use of antibiotics can make them ineffective over time (67.5%), and not giving their antibiotics to other family members with same illness (60%).

Perception Statement*	Agree n (%)	Disagree n (%)	Unsure n (%)	Demographic factors associated with statement (p – value)
Unnecessary use of antibiotics can make them ineffective over time	135 (67.5)	33 (16.5)	32 (16)	Age (0.006) Work or study in medical field (0.034)
If I suffer from flu, I expect my doctor to prescribe antibiotics for me	132 (66)	49 (24.5)	19 (9.5)	Education (<0.001) Work or study in medical field (<0.001)
I normally stop taking antibiotics when I start feeling better	127 (63.5)	63 (31.5)	10 (5)	Age (0.048) Education (<0.001) Work or study in medical field (<0.001)
If any of my family member is sick, I will give him my antibiotics if he/she has same illness as mine	67 (33.5)	120 (60)	13 (6.5)	None
I normally keep leftover antibiotics at home in case of emergency	97 (48.5)	92 (46)	11 (5.5)	Gender (0.009) Work or study in medical field (0.005)
I can use the leftover antibiotics when I am suffering from a similar condition in the future	85 (42.5)	100 (50)	15 (7.5)	Gender (0.011) Education (<0.001) Work or study in medical field (0.005)
I will take antibiotics according to the instruction written on the label	178 (89)	16 (8)	6 (3)	None
Normally I check the expiry date of the antibiotic before using it.	151 (75.5)	42 (21)	7 (3.5)	Age (0.011)

***Respondents with positive attitude indicated in bold**

Table 5: Perception of Respondents Towards Antibiotic Use

4. Discussion

This study sought to identify the knowledge and perception of the Fijian general population regarding antibiotics issues and to ascertain if there were factors associated with these main outcomes of interest.

The findings imply that there are widespread misunderstandings about antibiotic use, which could result in an unnecessary risk of antibiotic-resistant infection. The most critical misconception was about the role of antibiotics in treating infections, with over 80% of those polled failing to recognize that antibiotics do not cure viral infections. The proportion of respondents that incorrectly thought that antibiotics are used in the treatment of viral infections (83.5%) is comparable to that obtained in a study in Malaysia (86.6%) [11]. In contrast, the proportion was reported to be 46.2% in a Kuwait study [7]. The antibiotics cure infections caused by bacteria and not the virus. As a result, people must be educated about the differences between viral and bacterial infections, as well as advised not to take antibiotics for viral illnesses.

The respondents lacked the ability to distinguish between antibiotics and other regularly used medications, according to the findings. 81% of the respondents could correctly identify that amoxicillin is an antibiotic. However, paracetamol, prednisolone and aspirin were correctly identified as not being an antibiotic by 52%, 41.5%, and 52% of the respondents respectively. Several factors may have contributed to the public's lack of understanding in this area: the public was more familiar with trade names than generic names, had never heard of or used these medicines, rarely took note of the names of the medicines they were taking, or did not receive enough information from health-care providers.

65.5% of the respondents believed that antibiotics are used to relieve body pains, 60.5% stated that antibiotics may be effective even if you did not complete treatment, while 54% declared that they can reduce the dose of the antibiotics by themselves if they

start feeling well. The significant correlations found between the above-mentioned knowledge statements suggest that the knowledge gap isn't entirely random. Respondents may have mistaken antibiotics as equivalent to painkillers, prompting them to believe that discontinuing antibiotics is fine once symptoms improve, much as they would with painkillers.

In the knowledge assessment category, about two in three respondents had intermediate antibiotic knowledge. The age, educational level, and whether the participants were studying or working in medical field were found to be predictors of low antibiotic knowledge (Table 4). A study done in Nigeria also found education level of respondents to be a predictor of low antibiotic knowledge level [21].

Furthermore, only 24.5% of the respondents correctly answered that they would not expect their doctor to prescribe antibiotics if they suffer from flu. Further to this, only 31.5% of the respondents said that they would not stop taking their course of antibiotics when they start feeling better, leaving an alarmingly large number (68.5%) who may stop their course of antibiotics. This high rate of participants stopping their antibiotic treatment could be a major factor leading to rapid increase in resistant bacterial infections in Fiji.

In this study, respondents demonstrated a high positive perception (75.5%) towards checking of the expiry dates of the antibiotics before using them. However, the proportion of people checking expiry dates of medication before using them is lower as compared to similar studies done in other countries: Malaysia (93%), Malaysia (92.2%), Lebanon (83.2%), and Nigeria (93.3%) [9,11,16, 21]. This positive perception could be a result of increased awareness by the Antimicrobial Resistance Committee, Fiji.

Unfortunately, the harm caused by antibiotic misuse extends beyond the harm caused by the medicine itself. The damage includes eliminating beneficial bacteria in our bodies (for example, in the GI tract), disrupting the immune system's regular functioning, and a slew of other side effects. Antibiotic misuse also has a number of negative consequences, including an increase in physician visits, absenteeism, the duration of disease and suffering, and rising medical and therapeutic expenditures.

4.1. Recommendations

To improve the appropriate use of antibiotics, it is proposed that a well-planned, organized, and structured educational program be implemented. A team of health professionals can reach out to communities and advice the public in vernacular language regarding antibiotics.

Our views on antibiotics decides our future on antibiotic resistance. The educational institutions can have a programme initiated in the schools whereby the children are taught about the rationale use of antibiotics at an earlier age. To add on, this study could be used as a baseline and further research be done on a larger scale in order to identify the knowledge gaps regarding antibiotics among the general public in Fiji. Furthermore, collaboration between the doctors and pharmacists to educate patients about antibiotics can also be implemented. Pamphlets, flyers and posters about antibiotics can also be handed to patients. This will help patients better understand how to take the antibiotics, and measures to take in order to prevent or reduce the side effects from occurring.

5. Conclusion

70.5% of the respondents had an intermediate level of knowledge about antibiotics. 83.5% of the respondents were able to identify that antibiotics are indicated for the treatment of bacterial infections, whereas the same percentage of respondents incorrectly thought that antibiotics are also used to treat viral infections. The public surveyed had deficits in some crucial aspects of prudent antibiotic use, as well as negative attitudes about rational use of antibiotics. The findings of this study indicated areas of misconception and certain demographics in Fiji that should be targeted for educational interventions regarding the appropriate use of antibiotics.

Limitations

There were several limitations associated with this study. The research was conducted in English language whereby those people that do not understand this language were unable to participate in the study despite the multi- ethnic composition of Fiji's population. Limited time span to carry out this research was also a limitation. There is a possibility of selection bias in this study because it used a convenient sampling strategy. The results of this questionnaire survey, like those of other public surveys, were based on self-reported information, which is highly dependent on the respondents' honesty and recall capacity, as well as their understanding of the questionnaire. Another limitation was covid-19 due to which a lot of protocols and extra precautions were needed to be followed in order to avoid spreading the infection.

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