

## **Consumer's Perspective, Attitude, and Compliance on the Prescribed Antibiotics**

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## ABSTRACT

The study aimed to determine the level of perspective in terms of knowledge and belief, attitude in terms of experience and preference, and compliance towards antibiotics, as well as to identify correlations between the variables. The descriptive correlational method was used and was conducted among the first to third-year pharmacy students of Liceo de Cagayan University. Questionnaires were distributed to 140 participants enrolled in the second semester of the academic year 2020-2021. Findings showed that with correct perspective in terms of their belief and knowledge of antibiotics provides a more compliant consumer. On the other hand, attitude in terms of their experience and preference doesn't have a significant correlation with compliance. The majority has the right perspective, participants have no determining experience that affects their compliance resulting, in an undetermined attitude, and compliance gained an average of 4.15, making the majority compliant to the prescribed antibiotic. Concluding, compliance is affected by their perspective on the antibiotic, and attitude was deemed to have no significant correlation with compliance. Findings showed that there is a significant relationship between perspective and compliance. The health care system, pharmacists, and medical colleges should focus on educating people of the effects and appropriate use of antibiotics.

**Keywords:** consumer perspective, consumer attitude, antibiotic, compliance, adherence

## INTRODUCTION

Antibiotics are widely used today and commonly preferred by the public to take for the treatment of bacterial infections. However, according to the World Health Organization on 2020, "Antibiotic resistance is ascending to a dangerous level globally," antibiotic resistance has been an emerging threat for the treatment of infections caused by bacteria, which made treatment difficult, costly, or even impossible to treat, especially for patients who possess a high antibiotic resistance. That is why antibiotics should not be given as an over-the-counter (O.T.C.) drug; instead, one should have a prescription given by a physician, which ensures that one is qualified to take antibiotics. The rising issue associated with antibiotics' compliance has led the researchers to study the consumer's perspective, attitude, and compliance with the prescribed antibiotic. As known, antibiotic resistance is an emerging threat to the health of patients and causes fear to health care practitioners. One more reason for conducting this study is to measure the level of the perspective,

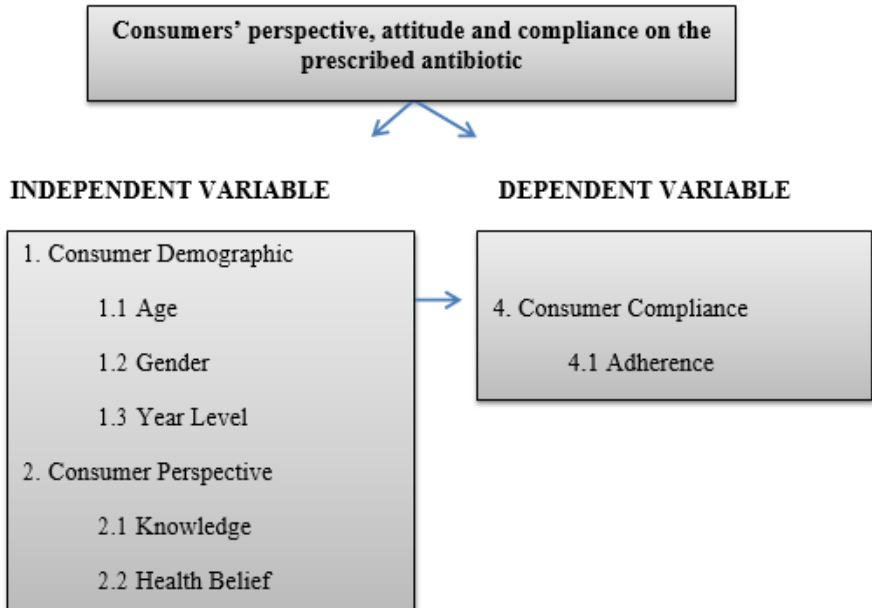
attitude, and compliance of the consumers to their prescribed antibiotics. Moreover, the researchers of this study would want to know the relationship of perspective and attitude towards their approach when it comes to compliance.

People always come up with different reasons why most of them could not keep up with the given dosing regimen or the instructions given by their physician. As stated from the study of Jose et al. (2013), noncompliance is the most common phenomenon cause of adverse impact on the success of the treatment. Noncompliance factors can be explained through the Health Decision Model by Eraker et al. (1984). This provided the framework for combined decision analysis, behavioral decision theory, and health beliefs. Under the Health Decision Model are (1) general health beliefs, (2) specific health beliefs, (3) patient preferences, (4) experience, (5) knowledge, (6) social interaction, and (7) sociodemographic factors. This model was reviewed again by Panesar (2012).

In the Philippines, as stated by Barber, D.A., Casquejo, E., Ybanez, P.L., Pinote, M.T., Casquejo L., Pinote, L.S., Estorgio, M., and Young, A.M. (2017) that 78% of Filipinos have a misconception that it is safe to stop or discontinue the antibiotic therapy. Consumer's knowledge and perception of antibiotics influence their attitude towards treatment and affect compliance positively or negatively. In this study, the researchers aim to do descriptive correlational research determining the perspective, attitude, and compliance on the prescribed antibiotics of the consumers, who are students of the College of Pharmacy of Liceo de Cagayan University, and to correlate the relationship between the variables. Assessing the variables which would give a significant relationship with compliance will provide information to the patients, health care providers, future researchers, and pharmaceutical companies, to improve in the marketing of the product by determining the perspective and attitude of consumers, to better the compliance of the consumers of the prescribed antibiotic.

## FRAMEWORK

The Health Decision Model, by Eraker et al. (1984), which was reviewed recently by Kiran Panesar (2012), best fits this study as its framework. It portrays the different factors that affect the patient's compliance. The model presented in the study of Panesar showed that the Health decision model comprises health belief, the patients' preferences, experience, knowledge, social interaction, and sociodemographic factor to which compliance to medications is affected accordingly.



*Figure 1.* Schematic diagram of the study

## OBJECTIVES OF THE STUDY

The study aimed to determine the relationship between compliance on the prescribed antibiotic and the demographic profile, consumer's perspective, and attitude.

## METHODS

This is a descriptive-correlational research conducted at Liceo de Cagayan University, Cagayan de Oro City. The respondents are taken from the target population of the study, which are the Pharmacy students from 1st year to 3rd year of Liceo de Cagayan University in the 2nd semester of the S.Y. 2020-2021. The sampling technique in this study is stratified random sampling with Raosoft software to calculate the total sample size. This software was used to identify the sample size from the given population size, using a 95% confidence rate and a 5% margin of error. Therefore from the population size of 218, the calculated sample size is 140.

After acquiring the sample size, stratified sampling formula was used, where population per strata or per year level was obtained. In order to gather the data

needed, the research instrument that was used is a guided response type of survey, specifically a Likert scale questionnaire, which is composed of 30 questions divided accordingly to the variables perspective, attitude, and compliance. The survey questionnaire that is used for this study is based on a survey that assessed public knowledge, belief, and behavior of antibiotic use in an Omani population conducted by Jose et al. (2013), and to the research on knowledge, attitude, and practice towards antibiotic use among the public of Kuwait by Awad and About (2015). Which was checked for its content validity and was assessed by two content experts, and the assessment was more subjective in nature. The survey questionnaires were then disseminated to the respondents through their Gmail. After the tally, the researchers sent the data to the university statistician for reliable calculation of data and interpretation. Then the researchers analyzed the data collected using the mean, correlational coefficient, p-value, correlational and descriptive analysis that is calculated and provided by the University statistician.

## RESULTS AND DISCUSSION

The survey questionnaire was completed by 140 pharmacy students from first-years to the third year of the College of Pharmacy in Liceo de Cagayan University in the 2nd semester of the S.Y. 2020-2021 who took antibiotics. The following tables shows the results of the survey conducted.

Table 1

*Frequency and Percentage Distribution of the Participants Age|(N=140)*

| Age                       | <i>f</i>   | %          |
|---------------------------|------------|------------|
| <1yr (infant)             | 0          | 0          |
| 1-4 years (Toddler)       | 0          | 0          |
| 5-9 (Child)               | 0          | 0          |
| 10-14 (Early Adolescence) | 3          | 2.1        |
| 15-19 (late adolescence)  | 63         | 45.0       |
| 20-29 (Early Adulthood)   | 74         | 52.9       |
| ≥30 (Late adulthood)      | 0          | 0          |
| <b>Total</b>              | <b>140</b> | <b>100</b> |

Table 1 shows that the respondents are mainly in the age bracket of early adulthood with a frequency of 74 (52.9%) composing 20-29 years old individuals, followed by the late adolescents with 63 (45%), which comprises 15-19 years

old individuals, and lastly the age bracket with the least amount, are the early adolescents with 3 (2.1%) of the respondents.

Table 2

*Frequency and Percentage Distribution of the Participants Gender (N=140)*

| Gender       | <i>f</i>   | %          |
|--------------|------------|------------|
| Male         | 27         | 19.3       |
| Female       | 113        | 80.7       |
| <b>Total</b> | <b>140</b> | <b>100</b> |

Table 2 shows that the majority of the respondents are female, with 113 (80.7%) and the rest are male, with 27 (19.3%) as fewer male students were enrolled in the Pharmacy course.

Table 3

*Frequency and Percentage Distribution of the Participants Year Level (N=140)*

| Year Level   | <i>f</i>   | %          |
|--------------|------------|------------|
| First Year   | 58         | 41.4       |
| Second Year  | 44         | 31.4       |
| Third Year   | 38         | 27.1       |
| <b>Total</b> | <b>140</b> | <b>100</b> |

Table 3 shows that the 1st year Pharmacy students have the highest number of respondents with 58 (41.4%), followed by 2nd year Pharmacy students with 44 (31.4%), lastly, the 3rd year Pharmacy students with 38 (27.1%), this accumulates to 140 respondents. The division of the year level is solved with the stratified sampling method, getting the right amount of respondents per year level to be able to represent the population of their group. Stratified sampling is used, where the population is split into strata that the research has relevance to, and would like to study the particular small group accordingly (Kaplan J., 2014).

Table 4

*Descriptive statistics of participant's level of consumer's perspective on Knowledge (N=140)*

| Indicators   | Mean        | SD          | Interpretation                  |
|--|-------------|-------------|---------------------------------|
| 1. Antibiotics are used for treating bacterial infections.   | 4.60        | .728        | Highly Knowledgeable            |
| 2. Antibiotics are helpful against all types of common cold and cough.   | 3.14        | 1.244       | Unsure Knowledge                |
| 3. Antibiotics could be purchased and taken without a doctor's prescription.   | 1.90        | 1.277       | Knowledgeable                   |
| 4. Missed doses can be taken with the following dose.  | 2.07        | 1.185       | Unsure Knowledge                |
| 5. I am aware of any health dangers associated with taking antibiotics.  | 4.11        | .953        | Moderately Knowledgeable        |
| 6. If you get severe side effects during a course of antibiotics treatment, you should stop taking them as soon as possible. | 4.18        | .954        | Moderately Knowledgeable        |
| 7. If you get some skin reaction when using an antibiotic, you should not use the same antibiotic again.                     | 4.16        | .984        | Moderately Knowledgeable        |
| 8. Unnecessary taking of antibiotics can increase the resistance of bacteria.  | 4.25        | .961        | Moderately Knowledgeable        |
| 9. Resistance to antibiotics is a global problem.  | 4.28        | .890        | Moderately Knowledgeable        |
| 10. Humans can be resistant to antibiotics.  | 3.96        | 1.096       | Moderately Knowledgeable        |
| <b>Average Mean</b>  | <b>3.67</b> | <b>.490</b> | <b>Moderately Knowledgeable</b> |

Table 4 shows the descriptive statistics of participant's level of consumer's perspective on knowledge. The results show that the perspective of the participants in terms of their knowledge is moderate with a mean of 3.67 and standard deviation of 0.490. In a survey by Shehadeh et al. (2012), they stated that the lack of knowledge often leads to the misconception about their uses, and in their study, most of their participants showed low knowledge of antibiotics. The results from their research and this current study differed mainly because of the different study populations. This study focused on consumers, specifically Pharmacy students in Liceo de Cagayan University, which is why it was expected that they are knowledgeable enough about antibiotics. A similar study by Fejza et al. (2016) also

reported that 144 pharmacy students who participate in their study showed good knowledge about antibiotics.

Table 5

*Descriptive Statistics of Participant’s Level of Consumer’s Perspective on Health Belief (N=140)*

| Indicators  | Mean        | SD          | Interpretation        |
|---|-------------|-------------|-----------------------|
| 1. The remaining antibiotic can be used again for similar symptoms without a doctor’s instructions. | 1.99        | 1.178       | Correct Belief        |
| 2. It’s ok to stop taking the antibiotic when you feel better from the symptoms.                    | 2.16        | 1.381       | Correct Belief        |
| 3. Taking a low dose of antibiotics is better than not taking any dose.                             | 2.86        | 1.164       | Undetermined Belief   |
| <i>Average Mean</i>   | <b>2.34</b> | <b>.463</b> | <b>Correct Belief</b> |

Table 5 presents the descriptive statistics of participant’s level of perspective on health belief. The result of the survey showed an average mean of 2.34 and standard deviation of 0.463 which can be said that the participants showed correct health belief based on their perspective. According to Sapkota et al. (2015), educational background plays a role in self-medication with antibiotics. Individuals who were non-science majors were more likely to use antibiotics for similar symptoms compared to science, public health, or medicine majors.

Overall, the participant’s level of consumer’s perspective on health belief falls on the correct belief. This suggests that Pharmacy students are well-informed on the knowledge crucial in taking antibiotics. The finding is consistent with other studies that reported good and at par knowledge of medical students in understanding antibiotics. The survey of Ahmad (2015) found out that Pharmacy students showed good knowledge regarding antibiotic use and resistance.



Table 6

*Descriptive Statistics of Participant's Level of Consumer's Attitude on Experience (N=140)*

| Indicators   | Mean        | SD          | Interpretation               |
|--|-------------|-------------|------------------------------|
| 1. I forget to take my antibiotics on time   | 2.81        | 1.284       | Undetermined Attitude        |
| 2. When I get an infection, antibiotics help me to get better more quickly.                      | 3.95        | .868        | Incorrect Attitude           |
| 3. A more expensive medicine is more effective.  | 2.81        | 1.339       | Undetermined Attitude        |
| 4. The cost of the antibiotic affects my compliance.   | 2.96        | 1.150       | Undetermined Attitude        |
| 5. I stop taking my antibiotic when I feel better from the symptoms.                             | 2.46        | 1.396       | Correct Attitude             |
| 6. I have experience adverse effect by antibiotics (e.g., vomiting, stomach upset, or dizziness) | 2.74        | 1.407       | Undetermined Attitude        |
| <b>Average Mean</b>  | <b>3.00</b> | <b>.731</b> | <b>Undetermined Attitude</b> |

Table 6 presents the descriptive statistics of participant's level of consumer's attitude on experience. The result of the study had shown that a large number of pharmacy students are still unsure if they forget to take their antibiotics on time. It resulted in an undetermined attitude in which signifies that the majority of the participants are uncertain if they have experienced forgetting to take the antibiotics on time. A study by Al-Shammari et al. (2010) found out that their participants who have answered that they have missed doses were 32.1%. Additionally, they have found out in their study that forgetfulness is one of the most accounted reasons for non-compliance, with 73.7%.

Overall the participant's level of consumer's attitude on experience almost is undetermined attitude. This suggests that the pharmacy students, as our participants have a lack of experience in taking antibiotics. Their attitude may conflict with their experiences, but because most of them have no enough experience in taking antibiotics, most of them will be undecided for now; they can't still figure out or determined their attitude because of lack of experience.

Table 7

*Descriptive Statistics of Participant’s Level of Consumer’s Attitude on Preference (N=140)*

|    | Indicators  | Mean        | SD          | Interpretation             |
|----|---|-------------|-------------|----------------------------|
| 1. | When I have a bacterial infection, I prefer to take antibiotics to prevent getting a more serious illness | 3.51        | 1.154       | Moderate Preference        |
| 2. | I prefer to be prescribed a well-known brand.   | 3.56        | 1.152       | Moderate Preference        |
| 3. | I am comfortable taking any type of dosage form (e.g., tablet, capsule, syrup, etc.)                      | 4.08        | .975        | Moderate Preference        |
| 4. | I prefer taking the antibiotic in a tablet-type dosage form.  | 3.95        | .932        | Moderate Preference        |
| 5. | I prefer taking the antibiotic in a syrup-type dosage form.   | 3.34        | 1.239       | Undetermined preference    |
| 6. | I prefer taking the Antibiotic via IV injection.  | 2.72        | 1.314       | Undetermined preference    |
|    | <b>Average Mean</b>   | <b>3.69</b> | <b>.665</b> | <b>Moderate Preference</b> |

In this section (Table 7), the respondents were asked six questions related to their general preference for antibiotics which correlates to their attitude towards their antibiotic treatment. The level of consumer’s attitude in terms of their preference resulted with an average mean of 3.69 and standard deviation 0.665 which is interpreted as having a moderate preference. Given that result, it shows how different people’s preferences are even with the type of antibiotic prescribed to them. When it comes to branded medications, most of the participants preferred to be prescribed with branded antibiotics. In another study, they discussed Filipinos’ preference in terms of what they would prefer to be prescribed, and it was found that 70.32% of their participants from North Luzon, South Luzon, N.C.R., Visayas, Mindanao, and Autonomous Region in Muslim Mindanao prefers branded medicines even though they were set at the same price (Wong et al., 2013). It can also be inferred from the results shown above that they prefer to take whatever they feel comfortable with such taking tablet-type of antibiotic rather than IV injections or syrups. According to Rapid Life Science (2017), tablets are usually an automatic choice by consumers. Although, there are still some people who have difficulties swallowing tablets which is why they would prefer a different one.

Table 8

*Descriptive Statistics of Participant's Level of Consumer's Compliance on Adherence (N=140)*

| Indicators  | Mean        | SD          | Interpretation   |
|---|-------------|-------------|------------------|
| 1. I Always complete the antibiotic in the period prescribes by my doctor                         | 4.31        | .881        | Compliant        |
| 2. I do not miss any of the doses while completing the course of Antibiotic                       | 4.00        | 1.053       | Compliant        |
| 3. I do not take the antibiotic directly from the pharmacy without a prescription from the doctor | 4.21        | .943        | Compliant        |
| 4. I do not share antibiotic with someone else in my family/friends with similar symptoms         | 4.06        | 1.047       | Compliant        |
| 5. I do not stop taking my antibiotics in the middle of therapy, even if I feel better.           | 4.08        | 1.093       | Compliant        |
| <b>Average Mean</b>   | <b>4.15</b> | <b>.751</b> | <b>Compliant</b> |

Table 8 shows descriptive statistics of the participant's level of compliance in terms of their adherence on their prescribed antibiotics. The highlight of this study is their compliance and as shown on the table above, the participants are compliant with an average mean of 4.15 and a standard deviation of 0.751. Most of the participants of this study answered that they always complete their antibiotic treatment as indicated by their physician, they do not miss doses, do not take antibiotic directly from the pharmacy without prescription, do not share antibiotic with someone else, and do not stop taking antibiotics in the middle of their therapy even if they feel better.

Table 9

*The Relationship Between Compliance on Adherence and the Demographic profiles, Consumer's Perspective, and Consumer's Attitude | N = 140*

| Variable               | Correlation Coefficient | P-value | Interpretation  |
|------------------------|-------------------------|---------|-----------------|
| Age                    | .081                    | .340    | Not Significant |
| Gender                 | -.025                   | -.044   | Not Significant |
| Year Level             | .309**                  | .000    | Significant     |
| Consumer's Perspective | .251**                  | .003    | Significant     |
| Consumer's Attitude    | .061                    | .476    | Not Significant |

Note: \*\*Correlation is statistically significant at the .01 level.

As shown in the table above (Table 10), the correlation coefficient for age, gender, and year level are 0.081, -0.025, and 0.309, respectively, with p-values of 0.340, -0.044, and 0.309 accordingly. Based on the results, age and gender have no significant relationship with compliance on taking prescribed antibiotics. Thus it fails to reject the null. While on the other hand, the respondents' year level was identified to have a significant relationship with compliance which has rejected the null for this hypothesis. The study of Jose et al. (2013) also had similar results wherein the gender of their participants had no significant relationship with compliance but, there was a significant relationship between the age group and educational qualification of their participants with compliance. The difference in result between this current study compared to the study with regards to the significant correlation with age and compliance is due to the difference in both of the studies' sample populations. In this study, Pharmacy students are the population, and since their first year in college, they have already been taught about the importance of antibiotic compliance, and as they progress their studies every year, their knowledge about antibiotics also widens. In support of the idea that students' knowledge widens as they go in their studies, a similar study was conducted at the University of Prishtina's pharmacy students, which showcased that 82% of their respondents have good knowledge about antibiotics (Fejza et al., 2016). Furthermore, a researcher named Mir found out in their study that medical students' knowledge, attitude, and practice about the use of antibiotics improved as they progress in every semester/year level (Mir, 2015).

After gathering the data from pharmacy students of the College of Pharmacy in Liceo de Cagayan University, the researchers found out that there is a significant relationship between consumer's perspectives and compliance. Thus it rejects the null, with a correlation coefficient and p-value of 0.251 and 0.003, respectively. Based on the results given in table 9, the respondents' perspective was significantly correlated with their compliance, and in this study, the sample population was Pharmacy students, and they exhibited moderate knowledge about the proper use of antibiotics (as shown in table 4) and were also found to have good compliance to their antibiotic treatment (as shown in table 8). The result of this study is coherent to the Health Decision Model by Eraker et al. (1984), in which compliance to antibiotics is affected by the respondent's knowledge about antibiotics. With these findings, the respondents are more compliant the more they have the right perspective in terms of their belief and knowledge. The lack of correct education on the effects and appropriate use of antibiotics is the reason for poor compliance (Awad & Aboud, 2015)

The conducted study showed that there is no significant relationship between the consumer's attitude and their compliance, failing to reject the null. The

calculated correlation coefficient and p-value for this variable were 0.061 and 0.476, respectively, which is somehow a weak positive correlation. Even though the participants reported a moderate knowledge of the proper use of antibiotics, their attitude does not correlate with their compliance. Thus it fails to reject the null. It signifies that attitude in terms of their preference and experience does not influence their compliance towards antibiotics. A study conducted by Fai et al. (2017) stated that “Attitudes predicted behavioral intentions and not adherence.”

## CONCLUSIONS

This research study was conducted to be able to identify the consumer’s perspective, attitude, and compliance on the prescribed antibiotic, as well as to assess the correlation of the variables of the study.

Medication adherence is still serving as a major problem that can risk many people’s lives. It can be said through this study’s findings that adequate knowledge of their medical treatment is indeed a big help for society. Results showed that the respondent’s knowledge of proper antibiotic use has a significant relationship with compliance. Therefore, indicating that the patients would be adherent and would comply with their medication therapy if they possess the right knowledge about antibiotics. On the other hand, based on the correlational study between the respondents’ demographics and their compliance, it showed that the age of the participants does not have a significant impact on their compliance, and even their attitude in terms of their preference and experience could not hinder them from complying the antibiotic medication therapy provided by their physician, therefore, failing to reject the null hypotheses.

On the basis of the findings, the following conclusions were made. The majority of the respondents are of early adulthood, composing 53% of respondents in the age 20-29 years old. Most are female, with first-year students having the largest population. The majority are highly knowledgeable that antibiotics are used for bacterial infections. The participants are equipped with the right belief that it is not okay to stop taking antibiotics even when you feel better and that antibiotics should not be used for similar symptoms without a doctor’s prescription. It was also found that the participants have no determining experience that could affect their compliance to the prescribed antibiotic having an average mean of 3, resulting in an undetermined attitude. On the other hand, participants are comfortable with any type of dosage form and have no set preference for this, which could hinder medication selection. Surprisingly the participants prefer to be prescribed a well-known branded drug to be prescribed to them. The participants’ overall compliance data were all resulting in them being compliant with a mean average of 4.15, making

them a good medicine taker. Perspective, in terms of knowledge and belief, holds the most significant influence over antibiotic compliance. Followed by perspective, the year level of the participants also holds significance on the compliance of the participants, assuming that a year more into studying about medicine provides them with more knowledge in the uses and effects of the medication and how important drug adherence is.

### LITERATURE CITED

- Al-Shammari, S. A., Khoja, T., & Al-Yamani, M. J. M. S. (2010). Compliance with short-term antibiotic therapy among patients attending primary health centers in Riyadh, Saudi Arabia. *Journal of the Royal Society of Health*, 115(4), 231–234. <https://doi.org/10.1177/146642409511500407>
- Ahmad, A., Khan, M. U., Patel, I., Maharaj, S., Pandey, S., & Dhingra, S. (2015). Knowledge, attitude and practice of B.Sc. Pharmacy students about antibiotics in Trinidad and Tobago. *Journal of research in pharmacy practice*, 4(1), 37–41. <https://doi.org/10.4103/2279-042X.150057>
- Awad, A.I., & Aboud, E.A., (2015). Knowledge, Attitude and Practice towards Antibiotic Use among the Public in Kuwait. DOI:10.1371/journal.pone.0117910
- Eraker S.A., Kirscht J.P., Becker M.H., (1984). Understanding and improving patient compliance. *Ann Intern Med.*100:258-268.
- Fai, Anderson, Ferreros, E. C. V. (2017, February 1). Role of attitudes and intentions in predicting adherence to oral diabetes medications. PubMed Central (PMC). [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5424778/?fbclid=IwAR3pMSUFhgq3nuZikueFORqmksyuuTuQ2p\\_4qpr8mfUbmKx2S1NAYXBTaw](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5424778/?fbclid=IwAR3pMSUFhgq3nuZikueFORqmksyuuTuQ2p_4qpr8mfUbmKx2S1NAYXBTaw)
- Fejza A, Kryeziu Z, Kadrija K, Musa M. Pharmacy students' knowledge and attitudes about antibiotics in Kosovo. *Pharmacy Practice* 2016Jan-Mar;14(1):715. doi: 10.18549/PharmPract.2016.01.715

- Jose, J., Jimmy, B., AlSabahi, A.G.M.S., and AlSabei G.A., (2013). A Study Assessing Public Knowledge, Belief and Behavior of Antibiotic Use in an Omani Population. *Oman Medical Journal*. Vol. 28, No. 5:324-330. DOI 10. 5001/omj.2013.95
- Kaplan, J., (2014). Stratified Random Sampling, BetterEvaluation. <https://www.betterevaluation.org/en/evaluation-options/stratifiedrandom>
- Mir SA. A cross-sectional study on knowledge, attitude, and behavior related to antibiotic use among undergraduate medical students in a tertiary care medical college. *Kashmir.Int J Basic Clin Pharmacol*. 2015;4(6):1156-1162. doi:10.18203/2319- 2003.ijbcp20151351
- Panesar, K., (2012). Patient Compliance and Health Behavior Models. Jobson Medical Information LLC. <https://www.uspharmacist.com/article/patient-compliance-andhealth-behavior-models>
- Rapid Life Science European Pharmaceutical Manufacturer, (2017). Top form: The benefits of multiple oral solid dosage forms. Rapid Life Science Ltd. <https://www.epmmagazine.com/news/top-form-the-benefits-of-multiple-oral-solid-dosage-forms/>
- Sapkota, A.R., Coker, M.E., Atkinson, N.L., et al. (2015). Self-medication with antibiotics for the treatment of symptoms in Southern Nigeria: a cross-sectional study. *BMC Public Health*.
- Shehadeh M., Suaifan G., Darwish R.M., Wazaify M., Zaru L., Alja'fari S., (2012). Knowledge, attitudes and behavior regarding antibiotics use and misuse among adults in the community of Jordan. A pilot study. *Saudi Pharm. J* 2012;20(2):125-133
- Wong JQ, et al. (2013). The Prevalence of Philippine Prescribing, Dispensing, and Use Behavior in Relation to Generic Drugs and their Risk Factors. Philippine Institute for Development Studies. Discussion Paper Series No.2014-17.<https://dirp3.pids.gov.ph/webportal/CDN/Publications/pidspjd13-generics.pdf>