

Evidence Based Practice Paper

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Introduction

In 1928, the world of medicine was revolutionized by the discovery of the world's first antibiotic: penicillin. After the discovery of this antibiotic, as well as others, many medical professionals thought that infectious diseases would soon be eradicated. However, bacteria quickly began developing resistance (Luiggi, 2010). Today, antibiotics are one of the world's most consumed medications. The excessive use and misuse of these drugs has led to the emergence and spread of many antibiotic-resistant microbes (McLellan, 2001, p. 438). Knowledge, attitudes, and practices, in regards to the use of antibiotics, plays a large role in the creation of these antibiotic-resistant microbes. In 2015, Agarwal conducted a study of 1,000 parents, on the use of antibiotics, where 872 individuals knew the term *antibiotic*, while only 135 participants knew the term *antibiotic resistance*. Nearly half of the participants incorrectly stated that antibiotics "could be used for any microorganism" (Agarwal, 2015, p. 22). This problem concerns nurses as well as all other medical professionals. Medical professionals should strive to educate their patients in the proper use of antibiotics because many patients rely on their physician and nurse for accurate medical advice and information (Rousounidis, 2011, p. 3251). With proper education, parents would be less likely to make medication errors and improperly use antibiotics.

Clinical Research Question

Globally, has education of parents or caregivers of children (0-18) decreased the incidents of drug resistance within children in the last five years? This paper seeks to investigate and

describe the following variables: parental knowledge, attitudes, and practices regarding antibiotics and how they affect antibiotic use in their children. The concepts that this paper is seeking to measure are knowledge, attitudes, and practice (KAP). The operation used to measure KAP in participants was a self-administered questionnaires using the 5-point Likert Scale (Sullian & Artino, 2013, pp. 541-542). When researching this topic, we found three appropriate articles that described the parental use and misuse of antibiotics for their children. These articles all used a descriptive approach which does not allow the variables to be classified as either independent or dependent.

Research Studies

Article I

The first article, *Descriptive Study on Parents' Knowledge, Attitudes and Practices on Antibiotic Use and Misuse in Children with Upper Respiratory Tract Infections in Cyprus* (2011), is a quantitative study that used a cross-sectional non-experimental design. This study's sample consisted of eighteen kindergarten schools and fifteen elementary schools that were randomly selected from two districts that had been stratified geographically clustered. Methods included a questionnaire that was sent home with the students by their teachers. The teachers also mailed the surveys back to the researchers. The questionnaire contained demographic information along with three sections which encompassed knowledge, attitudes, and practices. In addition, a different Knowledge, Attitude, and Practices (KAP) survey was given to all practicing pediatricians within the two districts of Cyprus. The data obtained were stored in a database

generated by Epi Info software. The statistical analysis was completed by using Epi Info and Statistical Package for Social Sciences (SPSS) software version 15.0. The qualitative data gathered was tested by the Chi-squared or Fisher's Exact test. The statistically significant data were involved in a conditional backward logistics regression model. A p-value less than 0.05 and was considered statistically significant. The survey's Knowledge section stated that ninety percent of parents reported that their pediatrician was the main resource of information. Additionally, ninety-three percent recognized that antibiotics have adverse effects and ninety percent concurred that abuse of antibiotics decreases their effectiveness and multiplies resistance. Furthermore, for the Attitudes section, 33.5% assume that their child's doctor would prescribe an antibiotic for URTI symptoms. Lastly, for the Practices section, 59% of the parents would question the doctor if it was necessary for the antimicrobial when they did prescribe one or would applaud the pediatrician when they refused to give an antibiotic. On the other hand, more than 97% of pediatricians coincided that incorrect usage can expand antimicrobial resistance and 60% prescribed antibiotics due to parental demands. An external threat to validity would be that the data was of local interest and there was not enough variability in interviewers. Therefore, the ability to generalize the findings to a larger population could be reduced. This study minimized threats to internal validity by randomly selecting schools and creating the survey to be self-answered (Rousounidis, et al., 2011, pp. 3246-3262).

Article II

The second article, *Validation of the parental knowledge and attitude towards antibiotic usage and resistance among children in Tetovo, the Republic of Macedonia* (2014), is a

quantitative study, that used a descriptive, cross-sectional, non-experimental design. The study's sample contained 500 parents attending local pharmacies selected at random in Tetovo, Republic of Macedonia. Questionnaires were self-administered to the parents in order to gather information regarding parental knowledge and attitudes towards the usage and resistance of antibiotics in children. The questionnaire had three sections: demographic information, knowledge of antibiotics, and attitudes towards antibiotics. The researchers analyzed the data using SPSS, version 19.0. Chi-squared and Fisher's Exact tests were used to check for significant association between demographics and reported recent antibiotic use including knowledge and attitudes. A p-value of less than 0.05 was considered statistically significant. This survey's knowledge section reported 29.4% of parents having an inadequate level, 53% having an average level, and 17.6% having a proficient level of knowledge. Additionally, the attitudes section identified that about 61% of parents saved unused antibiotics. Interestingly, about 60% of parents were not aware that antibiotics did not treat viral infections. Furthermore, 77% thought that giving their child antimicrobials would help in the recovery of a cold. The threat to internal validity was minimized by allowing the participants to remain anonymous. However, threats to external validity include incomparableness to a population-based sample, as well as there being a disproportional amount of subjects in their education level. Therefore, generalizability may be limited (Alili-Idrizi, et al, 2014, pp. 1-7).

Article III

The third article, *Antibiotics Use and Misuse in Children: A Knowledge, Attitude and Practice Survey of Parents in India*, is a quantitative study with a cross-sectional

non-experimental design. The study was conducted at a Multispeciality Hospital for Children in India. One thousand patients who visited the outpatient department between the months of September and November in 2014 were asked to complete a survey. This survey was used to analyze the knowledge, attitude, and practice of antibiotics used by parents and correlate it with the demographic characteristics. Consecutive sampling, a type of nonprobability sampling, was used in collecting the data. Descriptive and categorical statistics was used in this study to analyze the data. The study used a Chi-squared test to compare the categorical variables. A significant level of a p-value less than 0.05 was used. Results were collected and out of the 1,000 parents that were given the questionnaire, only 872 knew the term *antibiotic*. The 128 remaining parents, that did not know the term, were excluded from the analysis. This made the participation rate 87.2%. Fifty-four percent of the parents reported giving antibiotics to their child for a fever and 32.9% gave antibiotics for a cough and cold. Two hundred forty-four parents (28%) were aware that antibiotics are used against bacterial infection, while 228 parents (26.1%) incorrectly thought that they are used against viruses and 400 parents (45.9%) felt that antibiotics could be used for any microorganism. Only 135 parents (15.5%) knew about antibiotic resistance. More than a quarter (26.4%) of parents felt that antibiotics do not have any harm with excessive use. According to the article, reliability and face validity was tested by conducting a pilot study on twenty-eight subjects with related features like that of the studied population and who were not included in the final analysis (Agarwal et al., 2015, pp. 21-24). Since consecutive sampling, a weak form of sampling, was used, it can lead to sampling bias and eventually pose a threat to external validity. On the other hand, the questionnaire maintained anonymity, which decreased

the threat to internal validity (Polit & Beck, 2014, p. 174).

Evidence Hierarchy

All three of the articles that were used in the appraisals were on the evidence hierarchy level of single cross-sectional study. The participants in each study were given questionnaires at one point in time, thus strengthening the statement that the studies were cross-sectional. In articles I and II, a total of 1,462 questionnaires and 500 questionnaires, respectively, were analyzed over a period of four months. In article III, a total of 872 questionnaires were analyzed over the period of three months. In terms of the evidence hierarchy, these questionnaires contained level II descriptive quantitative questions used to test the parents' knowledge of antibiotics and their uses.

Conclusion

Currently, antibiotics are one of the world's most consumed medications (McLellan, 2001, p. 438.). Yet, there is a deficit in knowledge about antibiotics amongst non-medical professionals. The knowledge, attitudes, and usage of antibiotics have played a major role in antibiotic resistance.

Article I found that pediatricians were likely to prescribe antibiotics when the patient's fever lasted more than three days. Doctors felt that parents expect their child to be prescribed antibiotics for upper respiratory tract infections and felt that the parents were more likely to be unhappy when antibiotics were withheld. This study identified a significant number of parents rely on pediatricians as their primary source of information. Therefore, the outcomes are important because they exposed the need of education about antibiotics in both parents and

pediatricians (Rousounidis, et al., 2011, pp. 3246-3262). In article II, it was found that 60% of parents believe that antibiotics treat viral infections and 77% believe they are appropriate for treating the common cold. Thus, these results are important because it showed the researchers and the readers that healthcare professionals need to teach more effectively regarding antibiotics and their uses as well as possible consequences (Alili-Idrizi, et al, 2014, pp. 1-7). Article III, identified a significant lack of knowledge about what antibiotics do, how they work, and the risks of excessive usage. In fact, when conducting this study, 12.7% of the sample did not know the term *antibiotic* and therefore were unable to participate. This study's results were significant because it exposed that there is a deficit in understanding of antibiotics (Agarwal et al., 2015, pp. 21-24). All three research articles were single cross-sectional studies that fell into level II of the evidence hierarchy.

Globally, there is insufficient evidence to determine a reliable answer as to whether or not education of parents or caregivers in children (0-18) decreased incidents of drug resistance in children in the last five years. However, there has been sufficient evidence in identifying the correlation between education and antibiotic usage. Knowing this, it can be assumed that sufficient education positively impacts the proper use of antibiotics which can help prevent antibiotic resistance in children. Recommendations for evidence-based practice include patient education and culturing suspected bacterial infections before prescribing antibiotics.

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