

Parental Attitudes Toward Antibiotic Use for Their Sick Child:  
A Comparison Between Parents with Children in Day Care  
And Parents Whose Children Do Not Attend Day Care

Thesis

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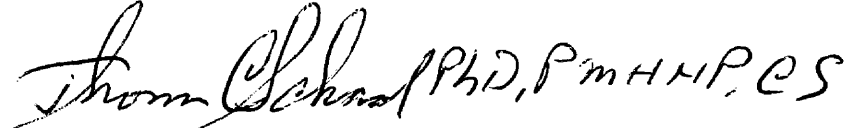
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## Abstract

**Objective.** The purpose of this research was to examine differences in attitudes toward antibiotic use for sick children with respect to two groups: parents with children in day care, and parents whose children do not attend day care.

**Methods.** A correlational study was done using a convenience sample of two groups of parents. A total N=37 was obtained. Sites for the sample were chosen based on type of child care used by parents. Demographic information was obtained in a questionnaire. Parental attitudes towards antibiotics for their sick children were obtained using an 11-item attitudes toward antibiotics questionnaire (Cronbach's alpha=.91). A t-test for equality of means was performed for each question to determine differences between groups.

**Results.** Responses were statistically significant between groups with respect to one question on the attitudes toward antibiotic questionnaire ( $p=.024$ ). This question was: "If my child has a cold or cough, taking an antibiotic is the best way to get rid of it". Eighty-two percent of the church group answered "somewhat disagree" or "strongly disagree", while 5.9% answered "somewhat agree" or "strongly agree". Twelve percent of this group were uncertain. In the day care group, 50% responded "strongly agree" or "somewhat agree", and 40% answered "somewhat disagree" or "strongly disagree", and 5% were uncertain. The responses to the other questions were not statistically significant.

**Conclusions.** Based on the results of this study, it is unclear whether having a child in day care affects a parent's attitudes toward antibiotics for their sick child. Further research related to this topic is needed.

## Chapter One - Introduction

One of the greatest discoveries in medicine was that of potent antimicrobial agents in the early part of the 20<sup>th</sup> Century. Penicillin was discovered in 1928, and first used to treat a patient in 1941, ending a time when people commonly died of infections now managed with ease. The recent appearance of resistant strains of bacteria is becoming a threat to the advantages these medications once offered. Microorganisms are able to gain resistance in a multitude of ways, including production of structure-altering or inactivating enzymes (beta-lactamases or aminoglycoside-modifying enzymes), alteration of penicillin binding proteins or other cell wall target sites, altered DNA gyrase targets, permeability mutations and ribosomal modification (File, 1999). Administration of antimicrobials leads to selective pressure and growth of resistant strains that were previously susceptible. These drug resistant organisms increase morbidity, mortality, and health care costs, contributing to an estimated \$4 billion annually (File, 1999). These strains are thought to arise from a number of factors including: increased number of immunocompromised hosts, lapses in infection control, increased use of invasive procedures and devices, widespread use of antibiotics in agriculture and animal husbandry, and dissemination of strains via global travel. The factor believed most responsible for this phenomenon, however, is the overuse and misuse of antimicrobials, especially extended-spectrum cephalosporins (File, 1999).

In the hospital setting, widespread use of antibiotics in critical care units and in immunosuppressed hosts results in the selection of multi-drug resistant organisms. This is one reason why today's intensive care units see the most resistant strains. Debilitated and immunosuppressed patients pick up these microbes easier than the general

population. They are also easily spread in an environment where patients are in close quarters and cared for by multiple health care workers. Outside of the hospital, the overuse of antibiotics for primarily viral infections is suggested to be the principle contributing factor to the increase of pathogens that are resistant to broad-spectrum antibiotics, such as streptococcus pneumoniae. It is estimated that 14% of this bacteria are now resistant, and risk factors to acquiring these strains are believed to be recent hospitalization, recent receipt of antibiotics and day care attendance (Wang, Kllner, & Arnold, 1998). Antibiotic exposure acts as a selection process whereby antibiotics inhibit the growth of bacteria that are susceptible, which then provides an advantage for resistant organisms to grow. Antibiotic exposure has been found to increase the risk of nasopharyngeal carriage of resistant strains by 2-5 times, and the risk of invasive disease with resistant pneumococci 2-10 times (Wang, et al., 1998). This has been demonstrated in children as well. In one study of three cohorts of children, two of whom received antibiotics for recurrent ear infections, nasopharyngeal specimens were isolated five months after a prophylactic antibiotic was initiated. It was found that 25% of pneumococcal strains from the group receiving antibiotics versus 0% in the control groups were resistant to penicillin. Four months after discontinuing antibiotics, only 5% of pneumococci in the antibiotic group were resistant (Wang, et al., 1998). Therefore, this association seems to be reversible after the exposure is removed. But for the first several months following antibiotic exposure, a child is more susceptible to acquire an antibiotic resistant strain of pneumococci. This is definitely a problem in the pediatric population as s. pneumoniae is the leading cause of bacteremia, pneumonia, sinusitis,

meningitis, and otitis media in young children (Arnold, Allen, Al-Zahrani, Tan, & Wang, 1999).

Office-based physicians in the United States prescribed 110 million oral antibiotics in 1992. 60 million of these were for children under age fifteen. Five common upper respiratory infections account for the majority of antimicrobial use in children, including acute otitis media, upper respiratory tract infection, bronchitis, pharyngitis, and sinusitis (Bauchner & Klein, 1997). Many of these illnesses are known to be viral in origin, making antimicrobials ineffective in their treatment. It is estimated that 65-70% of upper respiratory infections in preschool-age children are uncomplicated self-limiting viral illnesses (Mangione-Smith, McGlynn, Elliott, Krogstad, & Brook, 1999). The common cold is an example of a viral illness, and is the leading reason for seeking health care and a major cause of morbidity in children, accounting for 23 million missed days of school per year in the United States (Mainous, Heuston, & Love, 1998). The average child has 4-8 colds per year. There is, however, no cure for the common cold, and few effective treatments. Yet studies have shown that antibiotics prescribed for colds account for 23% of the total cost of managing upper respiratory infections, and add more than \$11 to the cost of every upper respiratory infection episode (Mainous et al, 1998). Despite a great deal of evidence that antimicrobials have no role in the treatment of these infections, 46% of children and 52% of adults diagnosed with upper respiratory infections leave the doctor's office with a prescription (Mangione-Smith et al., 1999). In one study, 1/3 of pediatricians reported that they have occasionally or more frequently prescribed antibiotics when they knew they were unnecessary (Bauchner, Pelton, & Klein, 1999).

Why would a physician prescribe a drug he knew to be inappropriate? There may be many reasons for this, including their beliefs that antimicrobials help in these situations, legal liability, need to be efficient in their practice, or misunderstanding of diagnostic criteria and indications (Bauchner, Pelton, & Klein, 1999). Also, some physicians believe antibiotics prevent secondary bacterial infection in the presence of a viral infection, although studies have shown this is not the case (Wang, et al., 1998). Non-clinical factors, however, mainly pressure from parents, are commonly cited by clinicians as primary reasons for excessive use of antibiotics (Bauchner & Phillip, 1998). Physicians reported in several studies that parental request or expectations for an antibiotic prescription pressured them into writing one when the diagnosis was surely or most-likely viral. The reasons parents expect antibiotics for their children are less clear. There are many factors that are believed to contribute to this expectation. The literature suggests that parental expectations are crucial in influencing physician practice, therefore, these expectations and the reasons behind them should be examined closely in order to change the current trends. It is very important to first understand parental perceptions, beliefs, and experiences before we can begin to educate them regarding antimicrobials and subsequently change antibiotic prescribing practices.

In one of the few qualitative studies done on parental and physician perceptions, Barden, Dowell, Schwartz & Lackey (1998), used focus group discussions to explore current attitudes of parents and physicians regarding use of antimicrobials. In these discussions, physicians and parents discussed their personal opinions regarding antibiotic use. What was found among both groups to be an underlying factor to overuse of antibiotics and subsequent resistant bacteria was day care attendance (Barden, et al.,



1998). In the physician group, some of the barriers to decreasing unnecessary antibiotic use reported were: parental expectations, physician attitude, pressure and incentives from pharmaceutical industries, and provider and patient desire for a quick fix. Three of the four physician groups cited day care attendance as a barrier to decrease unnecessary antibiotic use. Two of the groups spoke to the problem of day care attendance leading to more frequent infections, and one group's belief was that day cares encouraged antibiotic use. In the parents' groups, parents in one group stated that they frequently felt pressure by their day care provider to get medical treatment for their child's upper respiratory symptoms. Also, parents expressed that concern about being able to return to work often prompted them to seek medical attention for their child (Barden, et al., 1998).

The issue of daycare as it relates to childhood illnesses has been studied quite extensively. Some studies found that those children that attend daycare experience a greater number of respiratory infections than children who are cared for at home, with an increased severity of the infections (Schwartz, Giebink, Henderson, Reichler, Jereb, & Collet, 1994). Otitis media has also been reported to be more common in children attending out of home childcare (Schwartz, et al., 1994). Recurrence and persistence of otitis media has also been associated with daycare attendance. It was found in Wald, Dashefsky, Byers, Guerra, & Taylor's study (as cited in Schwartz, et al., 1994) that myringotomy and tube placement has been found to be performed more on children who attend daycare, (21% of daycare children, as compared to 3% of children in home care). A study by Kvaerner, Nafstad, Hagen, Mair, & Jaakkola, 1996, found that having siblings in daycare as well as the number of children in the daycare setting are the most important determinants for early acute otitis media.

Schwartz, et al., 1994, point out several aspects of community child care that promote the development and spread of resistant pneumococci, including the high prevalence and duration of pneumococcal carriage in young children, and the high number of children who receive antibiotics for therapy and prophylaxis. They further state that this is a major problem due to the fact that pneumococci are the most common cause of otitis media and a major cause of pneumonia in children. Another study by Marbury, Maldonado, & Waller, 1997, found that daycare attendance is also a risk factor for lower respiratory illness in children less than two years of age, as well as for repeated wheezing episodes and possibly asthma. Daycare attendance has also been found to increase upper respiratory symptoms and disease in 3-5 year old children, and long-term attendance in daycare has not been found to have any protective effect against these illnesses (Nafstad, Hagen, Oie, Magnus, 1999). The literature suggests that parental expectations greatly influence physician's prescribing practices related to antibiotics, and that having a child in daycare may increase the risk of certain childhood illnesses. It seems logical, then, that parents with children in daycare may be under additional pressure to get an antibiotic for their sick child. The reasons for this may be that their child needs an antibiotic. They may have more frequent bacterial infections in which antibiotics are indicated, or they may feel pressure from their daycare provider, as well as pressure to return to work, and expect antibiotics each time their child is sick, whether they are clearly indicated or not.

The pressure experienced by parents from day care centers was examined in one study conducted in Ontario. In this study, Skull, Ford-Jones, Kulin, Einarson, & Wang, 2000, found that staff at day care centers inappropriately suggest to parents that children

see a physician and receive antibiotics. Staff at these centers were also found to inappropriately exclude children from the center when they were sick, and 18% reported requiring antibiotic therapy before return (Skull, et al., 2000). These practices are based on false beliefs regarding antibiotic use, and are not in accordance with Canadian guidelines for child care centers regarding management of illness. More studies examining the role day care centers play on parental expectations are needed. No research was found that compared parental attitudes toward antibiotics between parents whose children attend daycare and those parents whose children do not attend daycare. It is important to examine whether having a child in daycare affects a parent's attitudes regarding antibiotics in order to understand the problem of misuse/overuse, and subsequent resistance in this population. The purpose of this study is to examine differences in attitudes toward antibiotic use for sick children with respect to two groups: parents with children in daycare, and parents whose children do not attend daycare.

### **Theoretical Framework**

The experience of a parent with a sick child can be directly related to Orem's self-care deficit theory in that a parent brings their child to a provider because they perceive them to be ill and they want them to be healthy and feel better. A child is unable to perform the necessary activities such as making an appointment, going to a provider, getting treatment, taking medicine, etc. Due to their age, they are not emotionally or intellectually mature enough to do so. Therefore, the parent is responsible to do these things for them. The way in which they go about this may vary widely between parents. Some parents who do not take good care of themselves may take excellent care of their children. They may not visit a health care provider for years themselves, but consistently

provide their child with necessary immunizations, well-child exams, and sick visits. Conversely, some parents that exercise many self-care activities for themselves, such as eating a healthy diet, exercising, and seeing a health care provider for preventative care may not provide this same level of care for their child. The researcher is drawing from one aspect of Orem's theory, that of a dependent-care agent that assumes the responsibility of meeting the self-care demands of another. In this study, the dependent-care agent is a parent, who takes steps to maintain the health, well-being, and safety of their child, who is unable to care for themselves. As children age, depending on their level of cognitive functioning, more of these activities will be their responsibility. How they are treated as children may influence the way in which they care for themselves as adults. Orem's model (as cited in Tomey and Alligood, 1998) is based on five major assumptions: 1) Human beings require continuous deliberate inputs to themselves and their environments to remain alive and function in accord with natural human endowments 2) Human agency, the power to act deliberately, is exercised in the form of care of self and others in identifying needs 3) Mature human beings experience privations in the form of limitations for action in care of self and others (their children) 4) Human agency is exercised in discovering, developing, and transmitting to others ways and means to identify needs and make inputs to self and others 5) Groups of human beings with structured relationships cluster tasks and allocate responsibilities for providing care to group members who experience privations for making required deliberate input to self and others. The self-care deficit theory that Orem developed is made up of three related theories: 1) the theory of self care, which describes how and why people care for themselves, and in this case, their children, 2) the theory of self care

deficit, which explains why people are helped by nursing and 3) the theory of nursing systems, which explains relationships that are necessary for nursing to be produced (Tomey & Alligood, 1998). The second theory, that of self care deficit relates to people who, for reasons of knowledge deficit, lack of resources, or physical/emotional restraints are not able to meet their self-care demand. They are not able to adequately take care of themselves. Orem describes nursing agency as “the developed capabilities of persons educated as nurses . . . to act, know, and help persons in such relationships meet their therapeutic self-care demands and to regulate the development or exercise of their self-care agency” (Tomey & Alligood, 1998). This aspect of her theory describes how nurses, through their education and training, act to aid patients to meet their self-care demand and educate and empower them to take better care of themselves. The third theory, that of nursing systems examines specifically the actions that nurses take in coordination with actions of their patients, to meet components of the patient’s self-care demands, and to regulate the exercise of their self-care agency. This aspect of her model as focuses on the nurse/patient relationship as it relates to meeting the self-care deficit. The main theory that will be examined as it relates to this topic is the first theory, that of self care.

Self- care is the practice of activities that people initiate and perform in order to maintain life, healthy functioning, personal development, and well-being. Self-care is learned and must be deliberately performed continuously in time and in congruence with one’s stage of growth and development, state of health, environmental factors, and energy expenditure. Their self-care agency is their ability to meet their health care needs. The theory of self-care deficit is what brings them to seek health care for themselves or

their dependents, and is “a relation between the human properties therapeutic self-care demand and self-care agency in which constituent developed self-care capabilities within self-care agency are not operable or adequate for knowing or meeting some or all components of the existent or projected therapeutic self-care demand” (Tomey & Alligood, 1998). More simply, when their ability to take care of themselves (self-care agency) is insufficient to maintain their health (self-care deficit), they seek help. This is what parents do when they perceive their child to be too sick to be cared for at home; they take them to a health care provider. Parents coordinate and influence the treatment their child receives by playing an active role and making decisions for them such as when they need to go to a provider, and which provider. They also report the signs and symptoms their child is experiencing, ask questions regarding plan of care and treatment, and many times suggest or request certain treatments they feel are appropriate, or that have been effective for them in the past. Everyone has their own individual ways of accomplishing this, depending on their knowledge level and life experiences. The activities that parents perform in order to care for their children, and the factors that influence their actions are the focus of this research.

## Chapter Two - Review of Literature

It is well documented that parental expectations and pressure on health care providers is a major factor in over-prescribing of antibiotics (Bauchner, et al., 1996; Bauchner, et al., 1998; Palmer and Bauchner, 1997). Why, specifically, many parents want an antibiotic is not obvious. One study by Mangione-Smith, McGlynn, Elliot, Krogstad, & Brook (1999), examined the relationship between perceived parental expectations and the prescribing behavior of pediatricians. This was a cross-sectional study conducted in two private pediatrician offices, which included 10 physicians and 306 parents who were there with a sick child. Parents completed a self-administered pre-visit questionnaire that included questions on demographics, attitudes toward receiving antibiotics, and expectations for the visit. They also completed a post-visit questionnaire with questions about which of their expectations were fulfilled and their level of satisfaction with the visit. Physicians completed a post-visit questionnaire with information on physical exam findings, diagnosis, treatment, and perceptions of parental expectations for antimicrobials, cough medicine, and decongestants. A 15-item instrument was developed that assessed parental expectations within three areas: physical exam, communication, and treatment. Parents' attitudes toward receiving antibiotic prescriptions were determined by the pre-visit questionnaire by using a version of a previously developed 11-item attitudes toward prescribing scale.

The results of this study were interesting. While only 17% of children with a diagnosis of probable viral cause received an antibiotic, compared with 96% of children with a probable bacterial diagnosis, children of parents who expected antibiotics received them 59% of the time, while children of parents that did not expect them received a

prescription 42% of the time (Mangione-Smith et al., 1999). Additionally, when a child had a viral diagnosis, if physicians thought the parent wanted an antibiotic, they prescribed one 52% of the time, compared with 9% of the time when they did not think the parent wanted one. Physicians were not found to be good predictors of parental expectations, however, being correct 73% of the time when parents did not expect an antibiotic, and only 41% of the time when parents did expect one. Patterns of diagnoses were also examined and it was found that when physicians thought parents wanted antimicrobials, they diagnosed middle ear infection 49% of the time, and sinusitis 38% of the time, compared to 13% and 5% respectively when they did not perceive antibiotics to be desired. The multivariate logistic regression model was used to predict unnecessary antibiotic prescribing, and revealed that physicians' perceptions of parental expectations for antimicrobials was the only significant predictor of prescribing when a viral diagnosis was assigned (Mangione-Smith, et al., 1999). Actual parental expectations were found to be a significant predictor for inappropriate prescribing. Multivariate adjusted proportions found that when physicians thought a parent wanted an antimicrobial, they prescribed one 62% of the time versus 7% when they did not think they wanted one. Fifty percent of parents expected to receive antibiotics in this study. Other investigations have reported pre-visit expectations to range from 48-65% (Mangione-Smith, et al., 1999). Another interesting finding was that the only significant predictor of parental satisfaction was failure to meet expectations regarding communication. When parents did not receive medications they expected, satisfaction did not decline. However, as the researchers of this study point out, satisfaction regarding the prescribing decision was not asked specifically, only satisfaction regarding the overall visit. It still appears significant that



overall satisfaction was no less when parents did not receive an antibiotic. This study suggests that parental expectations definitely affect prescribing practices, and also that a physician may change his diagnosis if he felt the parent wanted an antibiotic. Therefore, even though 17% of children with a viral diagnosis got a prescription, this number may actually be much higher.

In a study by Bauchner, et al., (1999), how parents influence the practices of physicians with respect to antibiotic prescribing as well as what strategies physicians believe are important in order to reduce inappropriate antibiotic use were examined. They used a questionnaire, mailed to a random sample of pediatricians in the United States regarding pressures pediatricians feel to prescribe antibiotics, how often they complied with parental requests, and how they feel this problem may be remedied. Ninety-six percent of pediatricians had parents request antibiotics during the previous month when they were not indicated. Forty percent reported that this occurred 10 or more times, 16% reported 7-9 times, 19% reported 4-6 times, and 20% reported 1-3 times (Bauchner, et al., 1999). Forty-eight percent reported that parents always, most of the time, or often put pressure on them to prescribe antibiotics when their children are ill but antibiotics are not indicated. One-third of respondents reported that they occasionally or more frequently comply with an inappropriate request. Thirty percent had parents request antibiotics over the phone ten or more times in the previous month. Seventy nine percent rarely or never complied with these requests. The single most important factor cited by physicians to decrease inappropriate use was educating parents (78%). Also cited were more careful diagnostic criteria (15%), decreased legal liability (4%), and drug detailing (<1%). Fifty-four percent indicated that parental pressure contributed the most

to inappropriate use of oral antibiotics (Bauchner et al, 1999). The problem with educating parents was reported to be time constraints due to managed care. Examining this issue as it related to Orem's self-care model, this education is the responsibility of providers in order to help patients address their self-care deficits. Knowledge deficit plays an important role in the self-care activities patients or parents of patients engage in to maintain the health of their child. Without an adequate level of knowledge, patients are less likely to meet their self-care needs.

In order to begin to educate parents, we first need to understand what parents believe about antibiotics and their indications. In a commentary by Bauchner and Phillip (1998), they began to address this issue. They suggest that the campaign to decrease inappropriate antibiotic use must be balanced, that both parents and physicians need reeducation on this topic. They believe that pediatricians need to discuss the role of antimicrobials with parents, and familiarize them with specific indications for them, as well as other therapeutic options that can be useful to manage symptoms. Current efforts have focused primarily on educating physicians, but the research suggests that educating parents may be equally beneficial. They point out that patient education and interventions have been shown to impact physician behavior. This is particularly true when physicians want to change their practice; most pediatricians report that antibiotic overuse is a problem that needs to be addressed, and practices changed. Additionally, data indicate that when antibiotics are used appropriately, resistance patterns can be reversed. The rate of pneumococcal resistance to erythromycin decreased by 53% in Finland, after a two year campaign in which only group A streptococcal infections and

not viral pharyngitis, were treated with penicillin rather than macrolides (Bauchner & Phillip, 1999).

Also in this commentary, they initially discuss the extent of inappropriate antibiotic use, which is difficult to estimate. According to data from the National Ambulatory Medical Care Survey (NAMCS), 128 million doses of antibiotics were given in 1998, compared to 86 million in 1980 (Bauchner & Phillip, 1999). The diagnoses for which antibiotics are prescribed have also increased. Thirty million prescriptions for acute otitis media were written in 1998, compared with 12 million in 1980. Antibiotics have been found to be prescribed in 44% of children with colds, 46% with upper respiratory tract infections, and 75% with bronchitis, diagnoses for which antibiotics are not clearly indicated. Pediatricians were found to be less likely than non-pediatricians to prescribe antibiotics for these diagnoses, but they account for the most prescriptions overall because they see the most children. It was found that 71% of family practitioners and 53% of pediatricians would immediately prescribe antibiotics for infants with mucopurulent nasal discharge that lasted one day. Only 1/3 of family practitioners and pediatricians waited until the seventh day of symptoms to prescribe. These physicians agree, however, that 10 days of symptoms are necessary before assuming a patient has sinusitis.

The parents' role in dispensing antibiotics is also discussed. Parents may have strong opinions about antibiotics, but many times they do not understand their indications, reinforcing the need for education. A survey of 400 parents found that they believe antibiotics were always or sometimes required for throat infection (83%), colds (32%), cough (58%), and fever (58%) (Bauchner and Phillip, 1999). In a study that

compared single dose intramuscular antibiotic treatment to standard ten-day oral therapy, 85% of 648 parents preferred single dose treatment. At the end of treatment, 90% of parents whose children received intramuscular therapy stated they would prefer it in the future, along with 76% of those whose children received standard treatment. Parents were also found to influence which antibiotics were prescribed. In a survey of 1000 pediatricians, 33% indicated that seven or more times in the previous month a parent requested a specific antibiotic or a different one than the pediatrician recommended. They also point out that a clinician is often asked to help balance family needs- a parent's need to return to work, and a child's need to return to daycare. This is clearly a problem. They recommend educating parents not only through their physician, but the media as well, through newspapers, magazines, pamphlets, and videos. This education is expected to improve this problem by decreasing parental pressure on providers, to the extent that parents may actually question why antibiotics are prescribed in certain situations.

Another similar study that focused on parental and physician perceptions was done by Palmer and Bauchner (1997). They interviewed parents regarding their opinions and concerns about antibiotics, and contrasted these findings with those of pediatricians, who filled out a self-administered questionnaire. A convenience sample of parents in three practices in the Boston area were interviewed. Two sites were private practices and the third was an inner city community health department. Parents were interviewed in waiting rooms by a research assistant and were asked questions regarding demographics and their experiences with antibiotics. One-hundred pediatricians across Massachusetts were also asked questions about their opinions regarding parent's views on antibiotics in the form of a mailed questionnaire. Names were chosen from the Fellowship Directory

of the American Academy of Pediatrics, the first name alphabetically in each town was selected. These questions focused mainly on physicians' perceptions of parents' concerns and were designed to mirror those in the parents' survey. Demographics from the first two practices were identical and were combined in the results. These parents were largely white (84%), and had completed college (80%). They were older on average than the community health department parents, had a higher family income, and were more likely to have commercial insurance for their children. Parents from the community health department were mostly black (80%), and had not completed college (91%). Overall, 78% of parents had experience giving their child antibiotics. Fifty-three percent had done so in the past six months, and 73% had done so in the past year. Eighty-nine percent were satisfied with their most recently prescribed antibiotic's ability to cure their child's illness and 78% said they gave their child every dose. Many parents believed antibiotics were helpful in ear and throat infections, and a large number also believed they were useful in treating colds, cough, and fever. More parents in the private practice group believed that antibiotics were helpful in ear infections (95%) and throat infections (87%), than parents in the community health department group (88% and 71% respectively). More parents in the community health department group indicated that antibiotics were useful to treat colds (59%) than those in the private practice group (23%). Fifty-eight percent of parents in both groups believed that antibiotics were useful for cough and fever. Twelve percent of parents from the private practice group believed that an antibiotic had been prescribed for their child unnecessarily in the past, while 3% of the community health department group reported this. Twenty-nine percent answered that they were worried that their child was receiving too many antibiotics, but 34% of

parents from the private practice group and 19% from the community health department group reported requesting an antibiotic for their child at some time (Palmer & Bauchner, 1997).

Most pediatricians returning the survey worked in a group practice in the suburbs, had been in practice a median of 12 years, and saw a median of 110 patients per week. Fifty-eight percent of physicians reported that they believed parents were worried that their children were receiving too many antibiotics. However, 71% reported that at least four times in the past month, a parent had requested an antibiotic when they were not indicated. Thirty-five percent reported that they at least occasionally complied with these requests. Sixty-one percent of pediatricians reported parents requesting a specific antibiotic at least four times in the past month, and they reported to be more likely to comply with these requests; 30% responded to often or most of the time complying.

This study points out that the relationship between parents and physicians with respect to antibiotics is complex. The parent survey suggests that parents have misconceptions about antibiotic use, and reasons for these may be misunderstandings regarding specific signs of illness and indications. The researchers give the example that if parents have prior experience with a child having cold symptoms, seeking care, and receiving an antibiotic for the diagnosis of otitis media, they may have misunderstood the diagnosis, and therefore respond that antibiotics are indicated in treating a cold. These types of gaps in communication may be one reason for parental beliefs that antibiotics are indicated when they are not. In the physician survey, they reported that parents request antibiotics when they are not indicated, and both surveys suggest that parents have a definite impact on whether antibiotics are prescribed, and which ones are written for.

Both surveys suggest that parents are concerned about the overuse of antibiotics, but often request them when they are unnecessary.

Although there have been several studies on the pressures placed on physicians with respect to prescribing antibiotics, there hasn't been a great deal of research on the pressures placed on parents. This issue is touched on in a study by Bauchner and Klein (1997) that examined parental issues in the selection of antimicrobial agents for infants and children. The researchers point out that the traditional American family has changed, and these changes affect a parent's expectations when they bring their sick child to a provider. In 1970, 87% of children lived in two parent homes, in 1990, this figure dropped to 72%. Households headed by single mothers has increased from 11.5% in 1970 to 25.9% in 1993. Additionally, more women have entered the workforce, and more children now attend daycare, an estimated 60% of children under five. Also, 65% of children under six years of age have mothers who work (Bauchner & Klein, 1997). These changes have lead to increased stress when a child becomes ill. For many mothers, staying home with a sick child is no longer possible. Parents want treatment that is effective and convenient in order for their children to get well quickly and return to daycare so they can return to work. Other issues that affect parental compliance and satisfaction with treatment regimens were found to be clinical efficacy, side effects, cost, convenient administration, acceptability of the antibiotic to the child, and parental experience with antibiotics. These are all factors that contribute to parental expectations, requests, and satisfaction with treatment. The pressures placed on a family in the twenty-first century must be accounted for in order to fully understand the scope of this problem,

and begin to solve it. Additional research in this area would add a great deal to the existing literature and may be a step forward making a change in current practices.

The misconception among parents regarding indications for antibiotics is one reason they pressure physicians to prescribe them, but there may be others. A qualitative study done by Barden, Dowell, Schwartz and Lackey (1998), looked at parents' and physicians' attitudes regarding antimicrobial use and uncovered some additional factors that play a part in parental expectations. They conducted a series of focus group discussions, which some believe are more conducive to eliciting subjective opinions. They focused on factors influencing antibiotic overuse and which factors may be possible to change. Physicians were recruited by telephone interview from a random sample of all practicing family physicians and pediatricians in the Atlanta, Georgia area. In order to be eligible, physicians must have had routinely cared for at least 15 patients each week under five years of age. Potential participants were invited to attend a focus group discussion on management of respiratory infections in children. They were not otherwise informed about the discussion, other than that a pharmaceutical company was not sponsoring it. The participants were divided into four groups, based on practice type. Group 1 was composed of those in private practice, group 2 served primarily medicaid patients, group 3 served managed care patients, and group 4 was a mixed group.

Parent focus groups were conducted at work sites and churches in metropolitan Atlanta. They were recruited through announcements made at various organizations. To be eligible, they must have had at least one child under five years of age. Potential participants were told that they were to discuss concerns about their child's health. Their children received health care services from pediatricians and family practitioners in a



variety of settings. Professional moderators of the focus groups used a written discussion guide that was developed by the researchers to facilitate group discussion. They also explained key concepts and asked questions to clarify participants responses. They followed Kreuger's guidelines for conducting effective focus group research (Barden et al., 1998). The questions for parents focused around the decision-making process to seek health care for their child, their experiences during medical visits, and their attitudes about antibiotics. Questions in the physician group were focused on methods of treating upper respiratory infections, concerns about the use of antimicrobials for non-specific infections, factors that contribute to antibiotic overuse, and ways to decrease antibiotic prescribing when it is not indicated. All focus group discussions were videotaped, and at least one observer took notes, which were compared with tapes, and then coded, categorized, and analyzed for recurrent patterns. Each group was analyzed individually and then compared with the other group. The conclusions were developed by two researchers, a pediatrician and a health educator, and were verified by a qualitative researcher that was not involved in the study. Seventeen pediatricians and 5 family physicians who served patients in a variety of payment plans attended the discussions and were included in the final study.

Group 1 (private practice) physicians reported that their antibiotic use could be decreased by an estimated 10-30% with no negative impact on patient care (Barden et al, 1998). All physician groups reported parental expectations to receive antibiotics to be the primary factor influencing them to prescribe when antibiotics were not indicated. Three of the five physicians in group 1 concurred that "the bottom line is that parents want antibiotics" (Barden et al., 1998). Additionally, 4 out of 5 physicians in group 1

cited day cares and other group exposures as another cause of overuse. Group 2 physicians (medicaid) estimated that their prescribing could be safely reduced by 25-50%. Two of the four in this group stated that antibiotics are often used inappropriately by specialists and emergency room physicians, citing use of potent antibiotics such as cephalosporins used commonly when children present to the emergency room with a high fever. Group 3 physicians (managed care) estimated use could be decreased by 25-30%, and cited the need for a “quick fix” on both the part of the physician and parents as a factor in overuse. Seven out of nine identified parental expectations as the principal reason for inappropriate prescribing. In this managed-care population, a barrier to education identified was that patients are forced to change doctors frequently due to their insurance. Group 4 identified pressure and incentives from pharmaceutical companies and the availability of free samples as reasons for overuse. They also stated that prescribing antibiotics enabled them to end a patient visit quickly, reassure the parent, avoid litigation, prevent possible sequelae, avoid late-night calls and increase patient satisfaction. All physicians in this group feared that if they did not give in to parental pressures, problems would arise. They also identified the increasing number of children in daycare, and parental wishes to get their sick child back in daycare as a reason for overuse. One physician stated “My patients’ parents want to be able to get the child back to daycare quickly”. All four groups felt that educating parents was an important way to decrease overuse, but reported mixed results in their attempts to do this. They felt videotapes in waiting rooms, as well as other approaches were needed.

Results from the parents groups differed somewhat. Group 1 parents indicated that they had no specific expectations regarding antibiotics when they brought their child

to a physician, and instead expected the physician to recommend the appropriate treatment. Some parents in group 2 believed that broad-spectrum antibiotics rapidly cure an infection, and prevent return visits. They stated that they want potent medications first so they don't have to come back. Not all parents in the group agreed with this. At least one parent in each group stated that green nasal discharge was an indication for antibiotics. Parents in all groups expressed concern regarding antibiotic resistance and overuse, several mentioning newspaper and magazine articles that alerted them to this problem. One mother said she felt relieved when her physician did not prescribe antibiotics, and another stated that she changed doctors because hers prescribed antibiotics "left and right" (Barden et al., 1998). Parents in group 3 stated that pressure from their day care provider to get treatment for their child's upper respiratory symptoms prompted them to see their physician. Also, parents in group 4 indicated that concern about being able to return to work prompted them to seek medical attention, and that they expect antibiotics when over the counter and home remedies were not effective. They all agreed, however, that as long as an explanation was given, they would be satisfied if they did not receive an antibiotic prescription. Parents also felt education was important, requesting guidelines to help them identify signs and symptoms that may warrant seeking medical help, and information on treatment they could provide at home. They cited credible sources of information to be physicians, nurses, health educators, pharmacists, friends, family, and package inserts.

This study sheds new light on factors influencing parental expectations, providing information that lack of knowledge may not be the only reason they request antibiotics. Pressures from day care centers and the need to return to work were mentioned by several

parents as other aspects of their life that affect the treatment they expect to get for their child. These factors should be examined more closely in order to fully understand this situation from a parent's point of view, and to begin to change the current trends. This study also suggested that there seems to be contradictions between parents' and physicians' perceptions due to lack of communication. Parents in this study did not seem to want antibiotics as much as physicians thought they did. In all groups, physicians attributed inappropriate practices to parental pressures. However, parents indicated that they would be satisfied with their visit even if antibiotics were not prescribed, as long as the physician explained the reasons for his decision. The finding that parents denied demanding antibiotics while physicians indicated that they felt pressure raises the question of whether self-reports by parents or physicians were accurate. This is a concern in all studies, but according to the researchers, focus groups elicit more honest answers than interviews or written surveys. The researchers also point out that physicians ultimately have the power to prescribe or not to prescribe, and interventions aimed at them have shown to be effective in changing their practices. However, if the primary reason for over-prescribing is parental pressure, physicians should not be the sole focus of education and interventions. In every interaction, open communication needs to take place so both parties are clear on the situation, and the illness is treated appropriately.

The issue of daycare as it relates to child health has been studied extensively in the past ten years. Many aspects of this issue were addressed at the International Conference on Child Daycare Health in Geneva, Switzerland in 1994. This conference identified many social pressures that contribute to the urgency of addressing this

problem: lack of adequate maternity legislation in many countries, the decline of the extended family, the increase of single-parent households, even in developing countries, and the continuing pattern of child-bearing by young women before social or biological maturity (Ching-Li, 1994). The number of children that attend daycare is unlikely to decrease in the near future due to these factors. An overview of the infectious disease problems in daycare settings by Osterholm, 1994, identified two host and environmental factors that contribute to the development and transmission of infectious diseases in these settings. The first is the age of the child. This is important because of the role of age-specific personal hygiene and immunologic or physiologic factors that may increase the risk of certain childhood illnesses. Any pre-toilet-trained children are potential transmitters of enteric or fecal agents. Also a problem with respect to the child's age is eustachian-tube dysfunction from upper respiratory infections, which predispose very young children to otitis media. The second factor identified by the author is the size of the facility. The author points out that the chances that a child will come in contact with an infectious agent is a function of the frequency with which that agent is introduced into the environment. A child is less likely to come in contact with an infectious agent if they are routinely in contact with four children daily rather than forty. At the time of this publication, at least ten viral and seven bacterial agents associated with the respiratory tract were documented to occur in daycare settings (Osterholm, 1994). This is important to remember with respect to the current study. One could argue that parents with children in daycare have different attitudes regarding antibiotics and may request them more often than parents whose children do not attend daycare for good reason: their children are sick more frequently, and therefore need antibiotics more. However, ten of the seventeen

respiratory illnesses identified to occur in day cares are viral, and therefore do not require an antibiotic. What the author also points out is that the risk of diseases in daycare reported in studies needs to be interpreted with caution. In order to determine risk, the incidence rate or frequency of disease of children in daycare needs to be compared to the incidence rate of children not in daycare. Child age, household socioeconomic status, race, and other factors also need to be accounted for. Without this information, it is impossible to determine whether the disease occurrence was due to daycare attendance. With this in mind, we can examine the current literature on this topic.

There have also been numerous studies conducted on the effect of daycare attendance on a child's health. In a recent study by Nafstad, et al., (1999), the effects of attendance at daycare on respiratory health was examined, with special focus on the age when starting daycare. The study population included 3853 children from Oslo, Norway, where, like many western countries, most children spend several years in daycare. Most children were between 4-5 years of age. Their parents completed a questionnaire regarding daycare arrangements, the child's health, environmental conditions, and family characteristics. Health outcomes examined included various respiratory symptoms, and type of daycare was divided into: home (with mother or father), family daycare (in a family's home outside of the child's home) and daycare center (owned by the municipality or privately owned). The starting age was defined as the age when the child first attended a daycare center. Other covariates examined were birth weight, duration of breastfeeding, maternal and paternal education, smoking, and asthma, pets (cats and dogs), and dampness problems. Eighty percent of the participating children were in daycare, 10% were in home care, 2% were in private homes, and 8% had combined

arrangements. It was found that the prevalence of all respiratory symptoms during the previous 12 months was larger among children attending daycare. The differences in occurrence of nightly cough, nasal symptoms, otitis media, and the common cold were substantial between groups. The occurrences of lower respiratory illness such as wheezing, heavy breathing, chest tightness, and allergic diseases was similar among the daycare children and the home care children. The risk of recurrent otitis media was strongly related to starting age with a decreasing trend in the risk the higher the starting age. It was estimated that 14% of common cold episodes and 26% of acute otitis media episodes in this population were attributable to daycare attendance.

Another study by Marbury, et al., 1997, as part of the Indoor Air and Children's Health Study had differing results related to lower respiratory illness in children attending daycare centers. The sample consisted of children of members of Group Health Incorporated, an HMO in Minneapolis-St. Paul, who gave birth between October, 1989 and January, 1991. Parents who agreed to participate were mailed a questionnaire regarding household characteristics, indoor pollution sources, and household members. On their child's first and second birthday they were also mailed questionnaires regarding occurrence of respiratory symptoms/illnesses, diagnosis of asthma, and daycare attendance. Children were followed until they withdrew from the plan or reached 2 years of age. Information from the children's medical records on all lower respiratory illnesses that occurred during the follow up period were obtained. Diagnoses included wheezing-associated respiratory illness, bronchiolitis, pneumonia, croup, and bronchitis.

It was found that daycare attendance is a risk factor for lower respiratory illness in children less than 2 years of age. The risk of lower respiratory illness did not vary with

the number of other children in the daycare center, or the number of hours spent in daycare (with the exception of <5 hours per week). They also found that daycare attendance is a risk for repeated wheezing episodes and possibly asthma. Children who attended daycare had twice the rate of lower respiratory illness. The second finding was interesting. The rate of lower respiratory illness did not vary with the number of children, as has been found in previous studies by Anderson, Parker, Strikas, Farrar, Gangarosa, Keyserling, & Sikes (cited in Marbury, et al., 1997). This study found that the risk was higher even among children who received care with only one other unrelated child. Also not reported in previous studies was the increased risk of recurrent wheezing illness and possibly asthma in daycare children. The authors point out that causation is unclear in this case. Lower respiratory illness in children less than 2 years of age has been shown to be a risk factor for asthma, but it is unclear if lower respiratory illness is a cause, or associated with an underlying condition that also predisposes one to asthma.

A study by Kvaerner, et al., 1996, examined the relation between early acute otitis media and exposure to respiratory pathogens mediated by siblings in daycare. This study was also conducted in Oslo, Norway, which proved to be an excellent setting due to the long maternity leave (42 weeks), and the custom in this country to keep siblings in their current daycare and caring for the newborn at home. The authors examined the extent to which having a sibling in daycare is a risk for acute otitis media in the first year of life, as well as whether sharing a bedroom with the daycare attendee increased the risk further. Their sample included children born in two main clinics in Oslo during a 15-month period between 1992-93. 3754 children were included in the study, with eligibility criteria including: address within the city of Oslo, no plans for



moving from Oslo within the near future, birth weight greater than 2000 grams, no serious illness which might impair respiration, at least one Norwegian speaking family member, at least one biological parent, and no drug abuse in the family (Kvaerner, et al., 1996). Initially parents filled out a questionnaire regarding health and environment during pregnancy, then when their children were 6 months and 1 year of age, they completed another questionnaire regarding the child's health and environmental exposures.

It was found that children with siblings in daycare had an almost twofold increased risk of acute otitis media. The authors point out, however, that simply having a sibling not in daycare also increases this risk, as compared to a child without siblings. The risk for acute otitis media was also related to group size. With four or more children in the daycare setting, there was found to be a twofold risk increase for acute otitis media. No significant differences were found between children that shared bedrooms and those that had separate bedrooms. The authors concluded that siblings who attend daycare are most likely secondary carriers of viral and bacterial antigens acquired in the daycare setting, and greater numbers of children in daycare increases the primary exposure to infectious agents.

Drug resistant bacteria are quickly threatening the advantages that antimicrobials once offered in easily managing infections. Antibiotic resistance and overuse is clearly a problem, and a definite solution is not obvious. Numerous studies have been done on this topic, mainly focusing on physicians, and factors that influence their decision to prescribe an antibiotic when one is not indicated. The literature has found that physicians admit to this practice, and reasons for this have been reported to be fear of litigation, the need for a

“quick fix”, lack of time for communication, the belief of some that antimicrobials may be helpful in certain circumstances, the need to be efficient in their practice, and misunderstanding of diagnostic criteria and indications. The primary reason for this overuse identified by physicians is pressure from parents to prescribe an antibiotic for their child. Studies have shown that 48-65% of parents bringing their ill child to a physician expect an antimicrobial, and many request one. Why parents do this is not completely understood. Lack of knowledge regarding indications for antibiotics is one major reason cited. Although more media channels are bringing this problem into the awareness of the public, studies show that many parents still believe that antibiotics are helpful for viral illnesses such as colds, cough, and other upper respiratory infections. More education is obviously needed in this area, and physicians and parents agree on this. There have not been many studies however, on the pressures placed on parents to have their child on antibiotics. These pressures may come from having a child in daycare. The review of literature suggests that children that attend daycare have higher incidences of various childhood illnesses. Some studies have shown that many times parents may feel pressured by their daycare to see a provider for their child’s illness. Many day cares have regulations that a “sick child”, defined in various ways, cannot return to the center until they are afebrile, or just generally well. Others require 24 hours worth of an antibiotic for certain illnesses. This may compel parents, who lack alternatives to daycare, or cannot afford to take time off work, to take their child to a provider and request an antibiotic at the first sign of an illness. For many parents the alternative seems to be missed days of work, with subsequent loss of pay or other negative consequences, or arranging for alternative care for their child while they are ill, which for many parents is impossible.

In a household in which both parents work, or in the case of a single working mother, the pressure to keep a child in daycare can be great. Sometimes, their child may actually need an antibiotic. The literature supports that these children are sick more frequently. However, many times the child may indeed be ill, but a virus may be the cause, and therefore an antibiotic would be ineffective, and merely contributing to the problem of overuse and resistance.

The pressures placed on parents by staff at day care providers was examined in a study by Skull, et al., 2000. In this study, the researchers randomly selected child care centers in Ontario to determine how decisions were made regarding: exclusion of sick children, management of children with upper respiratory infections, physician referral, and indications of the need for an antibiotic. Thirty-six centers participated in the study, in which a single, trained interviewer conducted telephone surveys to collect information from May 3, 1998 to July 27, 1998. The interviewer used a standardized questionnaire to interview the director of each center, who was reported to be responsible for the decision to send sick children home. The directors were asked their reasons for excluding diapered children with upper respiratory infections (URIs), and criteria used for physician referral or antibiotic use. The factors that influenced these decisions were explored, including pressure from parents (pressure from parents of the sick child to keep them in day care, as well as pressure from other parents to exclude a sick child so that their child would not be exposed), the ability of the child to participate in activities, and resources utilized to provide care to a sick child (Skull, et al., 2000). Attitudes toward antibiotic use in children with URIs were also examined. Actual staff practices were compared with practice guidelines. Canadian guidelines for the management of URIs in child care

centers lists two types of children that should be excluded: those who cannot participate in activities and those requiring a level of care that would compromise that of other children (Skull, et al., 2000). Four excludable conditions (chest infection, unusual behavior, strep pharyngitis, or purulent conjunctivitis treated with antibiotics for less than 24 hours), all require physician input, based on the guidelines.

Participating centers had a mean of 48 children, with an average weekday attendance of 40 full-time children. Sixty-nine percent of the centers reported having a written policy for the management of children with URIs. Staff at the centers felt that a diapered child with a URI should be excluded if: they were unable to participate in activities (92%), to prevent the spread of infection (67%), or if there were insufficient staff to provide adequate care (61%). The most common presenting symptoms leading staff to exclude children or advising a physician visit were ear pain, green/yellow nasal discharge, and cough with phlegm. No differences were found in exclusion practices between those centers that had a written policy for management of URIs and those that did not. Size of the center (less than or greater than forty children) was also not a factor. Four of the thirty-six staff reported excluding children due to pressure from other parents that did not want their child exposed to illness.

It was also found that there were exceptions to exclusions in some instances. Sixty-nine percent of staff reported keeping children at the center who they believed needed home care because they were on an antibiotic, and 14% did so because parents could not stay home from work. Sixty-four percent reported having difficulties with parents who did not want their child excluded. Sixty-two percent reported advising parents that their child should see a physician, and 41% required a period of exclusion on

the last occasion that they sent home a child. Antibiotics were believed necessary for strep throat (97%), ear infection (94%), and sinus infection (83%). However, they were also believed necessary for bronchitis (83%), cough (39%), non-strep pharyngitis (33%), colds (19%), and flu (17%). Thirty-eight percent believed antibiotics were required for non-specific URIs to prevent bacterial infection, to prevent the spread of infection (26%), and to hasten recovery (21%). Those with these beliefs were significantly more likely to request that the child be put on an antibiotic before return to the center. Eighteen percent of the centers required antibiotic therapy before a child with a URI could return.

This study suggests that the Canadian guidelines are not always followed by child care centers. Childcare staff in this study frequently gave advice and recommendations regarding physician referral and falsely suggested antibiotic therapy. While it is not unreasonable that childcare staff be alert to conditions requiring physician referral, they should recognize which symptoms warrant such referral. In this study, staff advised that a cough be referred 64% of the time and unusual behavior, which could potentially be more serious, 25% of the time. Children with cough or nasal discharge were excluded due to beliefs that exclusion may prevent the spread of infection. These practices are due in part to false beliefs regarding illness in children, and indications for antibiotics. Staff at day care centers directly perpetuate these beliefs by suggesting antibiotics therapy inappropriately, and by accepting children on antibiotic therapy who otherwise would have been excluded. In reality, there are few URIs that require exclusion based on whether or not the child is on an antibiotic. Furthermore, this decision should be made by a health care provider, not staff at a day care center. This study is evidence of the pressure that parents with children in day care face when their child is sick. It is

reasonable to assume that parents under such pressure, if not themselves knowledgeable about childhood illness and indications for antibiotics, would then pressure their provider for an antibiotic prescription for their sick child.

No studies were found that compared attitudes towards antibiotics between parents with children in daycare, and those whose children do not attend daycare. If differences between these groups were found, the focus of education should be aimed at parents and daycare centers in order to increase their understanding of differences between viral and bacterial infections, indications for antibiotics, and the dangers of prescribing antibiotics when they are not indicated. This increased understanding may lead to decreased pressure on providers, decreased unnecessary antibiotic prescriptions, and decreased resistant strains of bacteria. Therefore, the research question for this study is: Does having a child in day care affect a parent's attitudes towards antibiotic prescribing for their sick child?

## **Chapter Three - Methods**

### **Design**

The research design used in this study is ex-post-facto, or correlational. Variations in the independent variable, having a child in daycare or having a child that does not attend daycare, have already occurred naturally. The study simply examines correlations between the independent and dependent variable, without randomization or manipulation. A t-test for equality of means was used to compare groups with respect to demographic variables such as age, race, gender, marital status, income, type of household (single-parent or two-parent), education, number of children, and type of child care. Frequencies were reported for variables such as type of insurance, occupation, and spouse's occupation. With respect to the questionnaire regarding attitudes toward antibiotic use, for each group, questions A-K were analyzed and the frequency and percentage of specific answers were reported on a Likert scale. Also, a t-test for equality of means was performed for each question to determine differences between groups.

### **Sample**

A convenience sample of parents was obtained from two settings in Genessee County, Michigan. Parents with children in daycare were obtained from a day care center, and those whose children do not attend daycare were obtained from a church nursery. Eligibility criteria included: ability of parents to read and speak English, and having a child 6 months- 5 years of age. Parents with children who attend the day care center must have a child within that age range that has attended day care a minimum of 20 hours/week for at least six months. Parents with children that do not attend daycare must have children in that age range that is cared for in their home by a stay at home parent at

least five days a week. If this parent is employed at all, and the child is cared for by someone other than their spouse, it must be by a babysitter in the child's home, or at a baby-sitter's home with no other unrelated children. The Review Committee for use of Human Subjects in Research Request Form was then submitted for approval to the Institutional Review Board at the University of Michigan—Flint, and the study was approved. A total N of 37 was obtained from both groups. Verbal permission was obtained from the directors of both the day care center and the church nursery. Instructions and explanations regarding the purpose of the study accompanied each questionnaire, and participants were encouraged to contact the researcher with any questions or concerns. A copy of the Review Committee for use of Human Subjects in Research Request Form as well as the disclosure to participants can be found included in the appendices. Full disclosure of the study's purpose was not provided to the participants for fear of the Hawthorne effect. Parents were simply informed that the researchers were examining parental attitudes and beliefs about health care for their children. Anonymity was assured by requesting that subjects not provide their names on the questionnaires, unless they would like results of the study mailed to them upon its completion. Even in this situation, no names are reported in the final results. Also in the disclosure, participants were informed that their participation was completely voluntary, that they may withdraw at any time without question, and that their status regarding participation will in no way affect the health care their child receives. Subject's agreement to participate in the study was assumed by return of the questionnaire. The questionnaires were coded according to site only.



## **Instruments**

The self-administered questionnaire consists of two parts: 1) demographic data and 2) an 11-item attitudes toward prescribing scale. Both parts of this questionnaire can be found in the appendices. Part 1, the demographic data is comprised of items related to age, gender, race, marital status, level of education, employment status and occupation (self and spouse), income, number of children and how many are still living at home, type of insurance, and household characteristics (single-parent home, or dual-parent). This form was designed by the researcher. This data will provide evidence related to the potential effect of these extraneous variables on the results, as well as serving for comparison between the two groups.

Part 2 is the attitudes toward prescribing scale. This scale was originally developed by Virji and Britten (1991) in their study relating patients' attitudes and doctors' prescribing (Cronbach's  $\alpha=.72$ ). This scale was adapted in a more recent study by Mangione-Smith, et al., 1999, into one that is more applicable to parental attitudes towards antibiotic prescriptions for their children (Cronbach's  $\alpha=.91$ ). The scale consists of questions regarding antibiotics and care for their sick child, and responses were scored on a 5-point Likert scale ("strongly agree", "agree", "neutral", "disagree", and "strongly disagree"). Answers to questions were then compared using a t-test for equality of means.

## **Procedure for Data Collection**

Distribution of the questionnaires was carried out by personal solicitation at both sites. At the day care center, staff members distributed questionnaires to parents as they dropped off or picked up their children from the center. Staff were instructed only to ask the parents to participate and distribute the questionnaire. Any questions regarding the

study not answered in the disclosure section were directed to the researcher. Parents in this center chose to either fill out the questionnaire at the time of it's receipt, or return it to the center at a later date. The parents at the church nursery were solicited by the researcher and/or a faculty member of the University of Michigan—Flint, who attends the church. They were also simply asked to participate, and either completed the questionnaire at the time they received it, or returned it to the faculty member at the church at a later date. The researcher's name and telephone number were provided in the initial instructions if there were any questions or concerns.

## Chapter Four - Results

A total of thirty-seven parents returned questionnaires, seventeen from the church group (45.9%), and twenty from the day care group (54.1%). A t-test for equality of means was used to compare groups with respect to demographic variables such as age, race, gender, marital status, income, type of household (single-parent or two-parent), education, number of children, and type of child care. The two groups were not significantly different with respect to age, race, gender, marital status, income, or type of household. Twenty-five percent of the day care group and 11.8% of the church group were ages 26-30, and 25% of the day care group and 47.1% of the church group were 31-35. Thirty percent of the day care group and 35.3% of the church group were 36-40. Only one parent from the day care group answered 41-45 for age, while no one in the church group fell into this age range. Only three parents from the day care group (15%) and one from the church group (5.9%) were 20-25. The majority (67.5%) of both groups combined (82.4% of the church group and 55% of the day care group) were ages 31-40. Seventy-five percent of the groups combined were Caucasian, with the church and day care groups being 82.4% and 70% Caucasian, respectively. The church group had two Native Americans (11.8%), with no other races represented. The day care group was comprised of 8.1% African Americans, 5.4% Hispanic, 5.4% Native American, and 2.7% other. As compared to the general population, Caucasians were over-represented and minority groups were under-represented in this study. With respect to gender, the overwhelming majority of respondents were female. Eighty-seven percent of responding parents were female overall, with 94.1% of the church group, and 80% of the day care

group being female. Dads were under-represented with respect to the general population. A total of 73% of the respondents were married, (76.5% of the church group and 70% of the day care group), while 16.2% were single (5.9% of the church group and 25% of the day care group). No one in the day care group reported being divorced, while 11.8% of the church group was divorced (5.4% of the total). Six percent of the church group and 5% of the day care group reported being widowed (5.4% of both groups). The groups did not differ significantly with respect to type of household (single-parent or two-parent). Eighty-two percent of the church group reported having two-parent households, and 17.6% were single parent. These figures were 70% two-parent household and 30% single-parent household for the day care group.

The two groups were also not significantly different with respect to annual household income. The largest percentage (37.8%) of both groups' annual household income was reported to be between \$30-60,000, with 41.2% of the church group and 35% of the day care group falling into this range. Twenty-nine percent of the church group and 30% of the day care group made \$60-100,000/yr, and 5.9% of the church group and 15% of the day care group reported incomes of \$100-200,000/yr. No one in the church group reported making more than \$200,000/year, while 5% of the day care group fell into this range. Eighteen percent of the church group and 15% of the day care group had annual incomes of less than \$30,000.

The two groups were significantly different with respect to education, number of children, and type of childcare. The type of child care was intended to differ for the purpose of the study ( $t=9.947$ ,  $df=35$ ,  $p=.000$ ). The researcher wanted to examine parents with children in day care and those whose children do not attend day care, therefore,

sites were chosen specifically for this reason. As it turned out, one respondent from the day care group reported “home with parent” for type of child care. Fifteen (88.2%) of respondents from the church group reported “home with parent” for type of child care, while one person (5.9%) reported “family day care with more than two other children”, and did not answer number of hours in day care or how long the child had been in day care. One person from the church group also responded “day care center” for type of child care and one year for how long they had been in day care, and did not answer number of hours per week spent in day care. The data from the day care group with respect to how long their child has attended day care and how many hours per week are provided in Table One and Table Two. Frequency refers to number of people who fall into this category.

**Table 1-Number of Months in Day Care**

<b>Number of months in day care</b>	<b>Frequency</b>	<b>Percentage</b>
6	3	15%
12	4	20%
24	7	35%
36	4	20%
48	1	5%
Missing Data	1	5%

**Table 2- Hours Spent in Day Care Per Week**

Hours per week in day care	Frequency	Percentage
20	1	5%
30	1	5%
35	4	20%
40	4	20%
45	4	20%
50	5	25%
Missing data	1	5%

Seventy-five percent of the children had been in day care 1-3 years, with 15% reporting being in day care six months, and 5% reporting being in day care four years (Table 2). The majority of children (35%) had attended day care for two years. As was expected due to children starting school at age five, no one reported having a child in day care for longer than four years. Eighty-five percent of children attended day care 35-50 hours per week, while 10% attended day care 20-30 hours per week. Twenty percent of respondents reported having a child in day care for 35, 40, or 45 hours per week (each), while 25% reported 50 hours per week. One respondent (5%) reported 20 hours per week and one respondent reported 30 hours per week. The missing data row in each Table represents one respondent in the day care group that reported “home with babysitter” as type of child care, and therefore did not answer how long or how many hours per week their child attends day care.

With respect to education, groups differed significantly ( $t=2.304$ ,  $df=35$ ,  $p=.0504$ ).

Table Three shows educational levels for both groups.

**Table 3—Level of Education Among Groups**

	<i>Day Care Group</i>	<i>Church Group</i>
High School/GED	25%	35.3%
Associate's Degree	10%	35.3%
Bachelor's Degree	35%	23.5%
Master's Degree	25%	5.9%
Doctoral Degree	5%	0%

Overall, the day care group had higher levels of education than the church group, with 60% of respondents earning a Bachelor's or Master's degree, while 29.4% of the church group had completed this level of education. Twenty-five percent of the day care group and 35.3% of the church group had a high school diploma/GED, while 10% of the day care group and 35.3% of the church group had an associate's degree. One respondent from the day care group (5%) reported earning a doctoral degree, while no one in the church group reported earning this level of education. The groups also differed significantly with respect to number of children ( $t=3.657$ ,  $df=35$ ,  $p=.001$ ). Overall, the church group reported having more children than the day care group. Ninety percent of the day care group had 1-2 children, while 47.1% of the church group had 1-2 children. 52.9% of the church group and 10% of the day care group reported having 3-4 children. No one in either group reported having more than four children. The statistics for number of children living at home were very similar to number of children, as was expected ( $t=4.203$ ,  $df=34$ ,  $p=.000$ ). The differences reflect one respondent from each group reporting having four children, with two children living at home, and one

respondent from the church reporting having three children, but left number of children living at home blank.

Frequencies were reported for type of insurance, occupation, or spouse's occupation. Table Four identifies various insurance companies group members were insured through. Although no one from either group answered "none" to this question, two respondents from the day care group and one from the church group left the question blank, as depicted in the missing data row. It is unclear whether these respondents have no insurance, or simply chose not to answer the question.

**Table 4—Types of Insurance Among Groups**

	<i>Day Care Group</i>	<i>Church Group</i>
Blue Cross/Blue Shield	65%	35.3%
Blue Care Network	5%	5.9%
Health Plus	5%	17.6%
PPOM	5%	5.9%
Eatna	5%	0%
MESSA	5%	0%
BCBS PPO	0%	5.9%
Health Choice	0%	5.9%
HMO	0%	5.9%
Mcare	0%	5.9%
Self-Insured	0%	5.9%
Missing Data	10%	5.9%

With regard to occupation, in the church group 53% of respondents reported "homemaker", "mom", or "mother" for occupation, while all of the day care respondents



listed an specific occupation except one, who answered “none”. Occupations varied widely in both groups, as can be seen in Tables 5 and 6.

**Table 5—Occupations of Respondents from Both Groups**

	<i>Day Care Group</i>	<i>Church Group</i>
Admissions Representative	5%	0%
Attorney	5%	0%
Car Dealership	5%	0%
Child Care giver	0%	5.9%
Computer Analyst	5%	0%
Day care operator	0%	5.9%
Engineer	5%	5.9%
Executive	5%	0%
Grant Writer	0%	5.9%
Hair Stylist	0%	5.9%
Homemaker	0%	35.3%
Mom	0%	11.8%
Mother	0%	5.9%
None	5%	0%
Nurse	5%	0%
Physician	5%	0%
Plumber	5%	0%
Receptionist	5%	0%
Restaurant	0%	5.9%
RN	0%	5.9%
Sales	5%	0%
Salesperson	5%	0%
Secretary	15%	0%
Social Worker	5%	0%
Student	0%	5.9%
Teacher	10%	0%
Temp-EDS	5%	0%

As can be seen from the table, many of the occupations may or may not have the same meaning, such as “mom”, “mother”, and “homemaker”, “nurse” and “RN”, and “sales” and “salesperson”, but the researcher felt the occupations should be reported exactly as they were written by the respondents. Occupations are reported in Table 6.

**Table 6—Spouse's Occupation from Both Groups**

	<i>Day Care Group</i>	<i>Church Group</i>
Auto Trimmer	0%	5.9%
Computer Engineer	0%	5.9%
Data Entry	5%	0%
Engineer	10%	11.8%
Factory Worker	0%	5.9%
General Manager	0%	5.9%
General Motors	5%	0%
Maintenance	0%	5.9%
Manager	5%	0%
Mechanic	0%	5.9%
N/A	5%	11.8%
Nurse	0%	5.9%
Pastor	0%	5.9%
Pharmacist	5%	0%
Physician	10%	0%
Roofer	5%	0%
Sales	0%	5.9%
Sales Representative	5%	5.9%
Self-Employed	5%	0%
Student	0%	5.9%
Teacher	5%	0%
Warehouse Manager	5%	0%
Missing Data	30%	5.9%

As can be seen from Table 6, 30% of respondents from the day care group left spouse's occupation blank, and 5% answered N/A. In the church group 5.9% of the respondents left the question blank, while 5.9% answered N/A. These responses represent the participants that did not have a spouse. Occupation and spouse's occupation varied considerably, as can be seen.

With respect to the questionnaire regarding attitudes toward antibiotic use, for each group, question A-K were analyzed and the frequency and percentage of specific answers were reported on a Likert scale such as "strongly agree", "somewhat agree", "uncertain", "somewhat disagree", and "strongly disagree". These percentages are reported in Table 7 for both groups.

Table 7—Responses to Attitudes Towards Antibiotics Questionnaire

Questions	Strongly Agree		Somewhat Agree		Uncertain		Somewhat Disagree		Strongly Disagree	
	DCG	CG	DCG	CG	DCG	CG	DCG	CG	DCG	CG
A: The side effects from antibiotics are worse than the illness	10%	5.9%	30%	17.6%	10%	5.9%	5%	23.5%	40%	47.1%
B: Most colds will get better faster if treated with an antibiotic	25%	11.8%	25%	17.6%	10%	17.6%	10%	23.5%	25%	29.4%
C: When my child is ill, I usually give him/her one kind of medicine or another	25%	17.6%	50%	58.8%	0%	0%	10%	17.6%	10%	5.9%
D: Antibiotics do not have any side effects	5%	11.8%	20%	5.9%	5%	0%	20%	35.3%	45%	47.1%
E: I worry that if my child takes antibiotics too often, they will stop working	35%	35.3%	45%	47.1%	0%	0%	5%	11.8%	10%	5.9%
F: If my child doesn't get a prescription today, he or she will be sick longer	5%	11.8%	10%	23.5%	50%	17.6%	15%	35.3%	15%	11.8%
G: Doctors often give antibiotics when they are not really necessary	0%	11.8%	25%	41.2%	35%	29.4%	25%	5.9%	10%	11.8%
H: Most illnesses cure themselves without having to go to the doctor	5%	11.8%	30%	47.1%	25%	17.6%	25%	23.5%	10%	0%
I: If my child has a cold or cough, taking an antibiotic is the best way to get rid of it	10%	0%	40%	5.9%	5%	11.8%	15%	58.8%	25%	23.5%
J: If you do nothing for a cold for a week, it can turn into something serious	10%	0%	30%	29.4%	20%	11.8%	20%	47.1%	15%	11.8%
K: If the doctor does not give my child a prescription, I have wasted their time	0%	11.8%	20%	11.8%	10%	0%	30%	41.2%	35%	35.3%

The one question that was statistically significant between groups was question I ( $t=2.365$ ,  $df=34$ ,  $p=0.024$ ). This question is: “If my child has a cold or cough, taking an

antibiotic is the best way to get rid of it". Eighty-two percent of the church group answered "somewhat disagree" or "strongly disagree", while 5.9% answered "somewhat agree" or "strongly agree". Twelve percent answered "uncertain". In the day care group, 50% of parents responded "somewhat agree" or "strongly agree", and 40% answered "somewhat disagree" or "strongly disagree", and 5% answered "uncertain". The responses to the other questions were not statistically significant. The t value, degrees of freedom and p-value for each question are reported in Table 8.

**Table 8—t-test for Equality of Means on Questionnaire**

Questions	t	df	Significance (2-tailed) p-value
A: The side effects from antibiotics are worse than the illness	1.042	34	.305
B: Most colds will get better faster if treated with an antibiotic	1.122	34	.270
C: When my child is ill, I usually give him/her one kind of medicine or another	.218	34	.828
D: Antibiotics do not have any side effects	.343	34	.733
E: I worry that if my child takes antibiotics too often, they will stop working	.015	34	.988
F: If my child doesn't get a prescription today, he will be sick longer	-.377	34	.709
G: Doctors often give prescriptions when they are not really necessary	-1.575	34	.124
H: Most illnesses cure themselves without having to go to the doctor	-1.460	34	.153
I: If my child has a cold or cough, taking an antibiotic is the best way to get rid of it	2.365	34	.024
J: If you do nothing for a cold for more than a week, it can turn into something really serious	1.037	34	.307
K: If the doctor does not give my child a prescription, I feel I have wasted his/her time	-.180	34	.857

## **Chapter Five - Discussion**

The results of this study were statistically significant with respect to one question in the attitudes toward antibiotics questionnaire. This question (I), was: If my child has a cold or cough, taking an antibiotic is the best way to get rid of it ( $p=.024$ ). Fifty percent of the day care group answered “strongly agree” or “somewhat agree” to this question, compared to only 5.9% of the church group. In the church group 82.3% answered “somewhat disagree” or “strongly disagree”, compared with 40% of the day care group. There were no statistically significant differences between groups with respect to the other ten questions.

### **Theoretical Framework**

The purpose of this study was to examine differences in attitudes toward antibiotic use for sick children with respect to two groups: parents with children in day care, and parents whose children do not attend day care. This purpose is directly related to the way in which a parent cares for their child, which is influenced by a multitude of factors, all of which are possible explanations for the results. These factors are based on Orem’s theory of self-care, or, in this case, dependent-care. Orem’s model examines an individual’s ability to care for themselves, their self-care agency, as well as their ability to care for others, their dependent-care agency. This research is specifically focused on a parent’s dependent-care agency for their child. A parent provides care to their children during the early years of life because children are unable to care for themselves. Orem described dependent-care agency as “adults who accept and fulfill the responsibility to know and meet the therapeutic self-care demand of relevant others who are socially dependent on them to regulate the development of their self-care agency” (Tomey &

Alligood, 1998). Parents have many different ways of caring for their children, and the ways they go about doing so depend on their stages of growth and development, state of health, knowledge level, past experience, environmental factors, and level of energy expenditure. The influence on parents from outside forces is an example of environmental factors which parents draw from in order to care for their children. The degree to which this influence affects a parent is based on that parent's knowledge level and experience. Some parents, if well-informed regarding indications for antibiotics, are able to make better informed decisions than parents that are not well informed. Also, a parent's past experience with providers regarding antibiotics and their use could influence their present attitudes and beliefs. Orem believes that it is the responsibility of nursing to help a patient achieve their self-care demand, or, in this case, their child's self-care demand, through what she calls "helping methods". These helping methods are "a series of actions that the nurse performs in order to compensate for the health-associated limitations of persons to engage in actions to regulate their own functioning and development or that of their dependents" (Tomey & Alligood, 1998). The series of actions includes acting for or doing for another, guiding and directing, providing physical and psychological support, providing and maintaining an environment that supports personal development, and teaching. In relation to this study, guiding and teaching parents about antibiotics and their appropriate use is the nurse practitioner's responsibility in order to help them care for their children. Providers need to take the time to inform parents regarding appropriate use of antibiotics. It was hypothesized in this research study that the environmental factor of having a child in day care would affect a parent's dependent-care agency (their attitudes toward antibiotics). This was not

found to be the case, with the exception of question I. Possible reasons for this will be examined.

### **Limitations**

A number of the limitations of this study were related to sampling, and include a small N, and a convenience sample that was not representative of the general population with regard to many demographic variables. Only 37 parents were included in the study, 17 from the church group and 20 from the day care group. A larger N may have made a difference in the results, giving a more accurate representation of the population. Another limitation was that a convenience sample of parents was used. A large, randomized sample would have been optimal, and may have yielded different results. This particular sample of parents, because of its small size and non-random sample, may have been more educated regarding the use of antibiotics in children than some.

Many demographic variables within this sample population were not representative of the general public, such as race, gender, type of household, income, education, type of insurance, and age of parents. Seventy-five percent of the sample was Caucasian. In the church group, only one respondent was non-Caucasian; they were Native American. In the day care group, 8.1% were African American, 5.4% were Hispanic, 5.4% were Native American, and 2.7% listed "Other" as their race. As compared to the general population, Caucasians were over-represented and minorities were under-represented in this study. Also, 87% of responding parents were female. Fathers were also under-represented in the sample. Most respondents (76%) also reported being in a two-parent household, and 73% reported being married. Parents in a single-parent home situation may have different attitudes regarding antibiotics due to

increased financial pressure of caring for a sick child, and missed days of work. Related to this is the issue of household income. In this study, 67.5% of respondents reported annual incomes of \$30-100,000. Only 16.2% reported annual incomes of < \$30,000. A lower-income population may have additional pressure to keep their children healthy, but also may be less likely to have children in day care to begin with, for financial reasons.

Additionally, this sample was highly educated compared with the general population, with 48.6% earning a Bachelor's level of education or higher. A more representative sample with respect to level of education may have yielded different results. Also, no one in the sample reported "none" for type of insurance. Everyone was insured, which is also not representative of the general population, and may affect results. Those parents without insurance may be more reluctant to take a sick child to a provider, and request an antibiotic for financial reasons. Those with insurance may or may not be faced with this dilemma, depending on type of insurance, deductibles and co-pays, and their overall financial situation. Another limitation was age of parents. Most parents in this sample were 31-40 years old (67.5%). Only 28% of parents in this sample were ages 20-30, which is not representative of the general population, and could also affect results. Older parents may be more mature and have more life experiences to draw from, and the pressures placed on them from outside sources may not affect their attitudes as much as they would a younger parent.

Overall, this study population consisted of middle-upper class, well-educated, white parents, and therefore cannot be generalized beyond the population studied. It was the hypothesis of the researcher that there would be statistically significant differences in responses between the two groups due to their different types of



child care. Based on current literature, especially the study by Skull, et al., 2000, the hypothesis was that parents with children in day care would have different attitudes regarding antibiotics (favoring them) due to pressure from day care staff and the center's regulations regarding sick children. This finding would have supported the literature that day care centers influence parents to have their child on an antibiotic when they are sick. This then leads to pressure on providers from parents. Other numerous studies discussed previously have shown that this pressure on providers contributes to the problem of antibiotic overuse and resistance. Many studies have been done on why physicians prescribe antibiotics when they are not indicated. However, literature is lacking on why parents pressure providers for an antibiotic. Lack of knowledge is definitely a contributing factor, as the literature has shown. But pressures on parents from day care providers has not been studied extensively. The study by Skull, et al., 2000, found that day care center staff suggest to parents that their child see a physician to get an antibiotic, as well as exclude children from the centers for unwarranted reasons. This study would lead one to believe that parents with children in day care expect or request antibiotics from their providers more than parents with children who do not attend day care. Therefore, one could assume that parents with children in day care have different attitudes toward antibiotics than parents whose children do not attend day care. This was not found in this study, however, and there are many reasons why this may be. The limitations cited above are all possible reasons for these results, but there may be others.

In this sample population, the day care group was more educated than the church group, with 65% earning a Bachelor's degree or higher, while only 30% of the church group had attained this level of education. Despite this fact, the church group answered

more appropriately with respect to question I. One explanation for this could be more experienced parents in the church group due to increased number of children. Fifty-two percent of the church group had 3-4 children, and 47.1% had 1-2 children. In the day care group only 10% of parents had 3-4 children, while 90% had 1-2 children. It is possible that because the church group parents overall have more children, they have more experience with illness in children, and what signs and symptoms indicate the need for an antibiotic. However, one would have expected there to be significant differences in other questions as well, if this were a significant factor in parents' responses. It would also have been helpful to obtain the ages of respondent's children in the questionnaire. This could be an explanation for the results. If a parent has older children, and therefore more experience with illness, their attitudes may be different from those parents with a very young child or children. It was assumed that the day care children were between the ages of 1 month to 5 years of age, but there could be exceptions. The ages of the children in the church group are unknown.

The difference in education may also affect responses in another way. Being highly educated, any pressure from the day care staff may not affect this particular sample of parents the way it would some, because of their knowledge level. One particularly interesting finding from the day care group was that one respondent listed physician as her occupation as well as her spouse's occupation, and responded in ways that were not expected. For example, she responded "somewhat agree" to B: Most colds will get better faster if treated with an antibiotic, D: Antibiotics do not have any side effects, and I: If my child has a cold or cough, taking an antibiotic is the best way to get rid of it. She also answered "strongly disagree" to G: Doctors often give antibiotics when

they are not really necessary, and H: Most illnesses cure themselves without having to go to the doctor. It was surprising that a physician would not understand the indications for an antibiotic or be aware of the problem of overuse, which these responses suggest. It would be interesting to know what this physician's specialty is. This reinforces the idea presented in the literature that another possible solution to the problem of overuse may be education of physicians themselves. It is important for physicians to be aware of these issues and be able to educate parents accordingly.

Another possible explanation for the results is that the day care center sampled may have been more educated regarding use of antibiotics in children than other centers, placing less pressure on parents. Their staff may be well-informed regarding the indications for antibiotics from past education or experience. If they don't place pressure on parents the way that some day care centers might, attitudes of the parents may not differ significantly from the church group parents. When asked about their policy regarding sick children, this particular day care center stated that they did not have a policy that children needed to be on an antibiotic before they could return to the center. In fact, when researching which day care to sample, many day cares were questioned regarding their policy on sick children, and none reported having such a rule. Most of them, including the sample population stated that children were excluded for a temperature of  $>101$ , or a known communicable disease such as a rash. The only policy related to antibiotics reported by the centers questioned was in the case of conjunctivitis. In this case, a child needed to be on an antibiotic for 48 hours before return to the center, which is appropriate. The researcher realizes that what centers state as their policies may differ from their actual practice, based on the study by Skull, et al., 2000.

The results were also interesting in that some questions which seemed very similar to question I were not answered in a statistically significant way between groups. For example, question B states : “Most colds will get better faster if treated with an antibiotic”. It would seem that if a person believed this, they would also feel that when their child is sick, taking an antibiotic is the best way to get rid of it (question I). This was not the case in this population. One explanation for this could be that question B does not ask specifically about their own child; it is a general question regarding the use of antibiotics to treat colds and cough. Question I speaks specifically about a parent’s child, and how to treat a cold or cough for them. Parents may logically understand that antibiotics are unnecessary for colds, but when their own child has a cold, they may request one anyway. Also, question I added “cough” to the question, and some parents may believe that an antibiotic is not indicated for a “cold”, but is indicated for “cough”. Adding the word “cough” may be the reason for the difference in responses to these questions. Additionally, there may be a problem inherent in the tool that was used. This tool has been used in previous studies, and has a Cronbach’s alpha of .91, however, only one study was found that used the modified instrument used in this study. Therefore, problems with its reliability and validity are possible. If the tool is not measuring what it was intended to measure, attitudes of parents regarding antibiotics for their children, the results may be erroneous.

The researcher hypothesized that excluding children due to a fever may indirectly pressure parents to have their child seen by a provider, and receive an antibiotic. Many parents may believe that a fever means an infection, and an infection means they need an antibiotic, when in reality, most fevers in children are due to viruses. Small children can

also have a fever when teething. Children with viruses may need to be excluded to prevent the spread of illness, but they do not need an antibiotic. Parents may think that if they get an antibiotic for their child, they will get better faster, their temperature will go down, and they will be able to return to the day care center. Thus, although no day care centers that were interviewed stated that they had specific rules regarding antibiotics for cough, congestion, etc., the policy regarding fever may itself pressure parents. This hypothesis may or may not be correct, as seen from the results. A question specifically regarding fever in the questionnaire may also have been helpful.

These aspects of this study are all possible reasons why the findings of this research differed from that found by Skull, et al., 2000, the only other study found related to this issue that specifically targeted day care centers. Also, the studies differed in that the Skull, et al. study used a random sample of child care centers. They sampled 36 directors who answered interviews regarding management of children with upper respiratory infections. They found that staff in these centers frequently gave advice and recommendations regarding physician referral and antibiotic therapy. This may indeed be the case in many day care centers in Canada as well as the United States. However, the implications of these recommendations remain unclear. Does this pressure indeed influence parents to get an antibiotic for their sick child? This remains to be seen. This study seems to suggest otherwise. However, the day care parents did have significantly different views than the church group when asked specifically about treating their child with a cough or cold, favoring antibiotic therapy. This could possibly be due to pressure from their day care center. More studies are needed in this area to support or reject this position. The case may also be that this pressure may influence a parent to get an

antibiotic prescription for their child, but overall does not change their inherent beliefs regarding antibiotics, which is what the questionnaire in this study examined. One would assume that a parent's attitudes toward antibiotics would affect their actions in attempting to obtain one for their child, but, as is emphasized in Orem's theoretical model, the way in which parents provide care for their child is complex and multi-factorial.

### **Implications for Practice**

Due to the limitations of this study, the implications for clinical practice are also limited. The reasons for the lack of statistical significance with regard to most of the questionnaire have been examined. However, the question (I) that was statistically significant between groups did support the hypothesis of the researcher, as well as previous literature on this subject. Whether or not the reason for this was indeed the difference in type of childcare between groups is not clear. Further studies are needed in this area in order to advance the knowledge base related to this issue, make an impact on clinical practice, and subsequently, decrease the overuse of antibiotics. The implications of future research studies could potentially change the practice of antibiotic prescribing, and begin to solve the problem of antimicrobial resistance.

### **Future Recommendations**

Future research related to antibiotic overuse and resistance should focus on pressures placed on parents, including those by day care centers, that leads to pressure on providers to prescribe antibiotics that are not necessary. The literature has shown that the main reason that physicians prescribe antibiotics when they are not indicated is parental pressure. Many research studies have found this to be true. What is not clear, however, is why parents pressure providers for antibiotics for their children. The

problem of day care centers regulations and inappropriate suggestions from staff is theorized to be a contributing factor to this problem. Further research needs to be done in order to examine this. Ideally, studies with a larger, randomized sample and a population of parents that is representative of the general population should be done. It would be helpful to specifically target parents with questionnaires, surveys, or even qualitative studies to shed light on factors that influence their health decisions for their children. It would be interesting to compare parents with children in day care and parents whose children do not attend day care with various instruments, such as the one used in this study, for differences. At this time, research specifically targeting parents is limited, most studies have targeted physicians or day care centers. Since parents are implicated in the literature related to the problem of overuse, they should be the focus of future research.

If future research could find a component of a parent's life or experience that affects their beliefs regarding antibiotics, we could then begin to solve this problem by focusing on that component. The component may or may not be found to be attendance at a day care center. If so, education of staff at these facilities as well as changing regulations and policies may be the answer. If staff at day care centers understood these indications, and which signs and symptoms to look for in children, they would be less likely to pressure parents into getting an antibiotic prescription from their provider unnecessarily. Parents may also need education regarding antibiotics, and consistency among providers would aid in this. Currently, if a parent believes their child needs an antibiotic and they don't get one from one provider, they may go to another provider until an antibiotic is prescribed. As has been shown in the literature, many providers will

prescribe an antibiotic when they know it is not indicated if a parent pressures them. This not only undermines the actions of the first provider and challenges best practice, it perpetuates false beliefs among the public regarding appropriate indications. If a parent is receiving conflicting messages from different providers, it is understandable why there would be confusion. Providers also may need education regarding indications for antibiotics, as well as the magnitude of the problem of overuse. Many may not see the harm in prescribing an antibiotic every now and then for a child that doesn't need one. If they were informed about how massive this problem has become, they may be more likely to prescribe based on history and physical exam findings rather than any extraneous variables.

Education in all of these forms, is paramount to attempting to influence the problem of antibiotic overuse and resistance. If a parent understands what is best for their child, the majority are going to comply, based on Orem's model. It is the responsibility of providers, whether they are registered nurses, nurse practitioners, or physicians to educate parents regarding antibiotic use and misuse. This may take time, which is more and more lacking in the environment of managed care, but is crucial in addressing this issue. A little extra time spent during a visit with a parent of a sick child may help avoid many problems in the future. For a parent, an open and trusting relationship with their provider could potentially counteract any outside pressures, such as those from day care centers. Additionally, if future studies found that day care centers do indeed play a significant role in this problem, the medical and nursing communities would need to educate them regarding proper use of antibiotics to reduce pressure on



parents. This would then lessen pressure on providers, consequently decreasing overuse of antibiotics, as well as resistant strains of bacteria.

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## Appendices

**THE UNIVERSITY OF MICHIGAN-FLINT  
REVIEW COMMITTEE FOR THE USE OF HUMAN SUBJECTS IN  
RESEARCH**

**REQUEST FOR REVIEW**

Date: June 16, 2000 \_\_\_\_\_

Name of research worker(s): Teri L. Kinney, RN, BSN  
(indicate student, faculty, or staff)  
student in Family Nurse Practitioner Program at the University of Michigan-Flint

Principal investigator or sponsor (if other than the above): Tom Schaal, PhD  
(faculty sponsor for student project)  
Maureen Tippen, RNC, MS

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Course (if any): NUR 597

Proposed starting date of research project: August 1, 2000  
(One month should be allowed for the Committee's review)

Title of research project: **Parental Attitudes Towards Antibiotic Use for their Sick Children: A Comparison Bwtween Parents Whose Children Attend Day Care and Parents Whose Children Do Not Attend Day Care**

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**I. PURPOSE OF THE RESEARCH PROJECT:**

The purpose of this research is to examine differences in attitudes towards antibiotic use for children with respect to two groups: parents with children in daycare and those whose children do not attend daycare. The literature suggests that the overuse of antibiotics for primarily viral infections is the principle contributing factor for the increase in resistant strains of bacteria. It also suggests that a main factor in prprescribing antibiotics in the pediatric population when they are not indicated is pressure from parents on health care providers. We would like to examine why parents pressure their health care providers to prescribe antibiotics for their children. Some studies have found that parents may feel pressure from their day care center to seek medical treatment for their child at the first sign of illness. Physicians have also reported in studies that attendance at day care is a factor in the overuse of antibiotics, because of increased exposure to infections, as well as promotion of the use of antibiotics by day care centers. The literature suggests that children in day care experience certain illnesses more often than those that do not attend day care. We wish to examine if having a child in day care

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affects a parent's attitude toward antibiotics to further understand this phenomenon as it relates to bacterial resistance.

## **II. SUBJECTS/PARTICIPANTS:**

### **A. How many subjects are needed?**

**N=60**

### **B. How much time will be required of each subject?**

**Approximately fifteen minutes, or the length of time required to fill out a short questionnaire.**

### **C. Restrictions or special qualifications of subjects--i.e. age, sex, past work experience, special abilities or presumed deficiencies, etc.**

**Parents must be able to read and speak English. The sample of parents from the day care center must have a child aged six months to five years old that has attended day care full time for at least six months. The sample of parents from the church nursery must have a child in that same age range that has never attended a day care center. These children must be cared for in their home by a stay at home parent at least five days a week. If the parent works at all, children must be cared for at home by a babysitter, or at a babysitter's home with no other unrelated children.**

### **D. 1. Will subjects be pre-selected? If so, on what basis (test, interview, etc.)? Subjects will be chosen at a day care center and a church nursery based on meeting eligibility criteria and willingness to participate in the study.**

#### **2. What list or lists of potential subjects are to be used? How are these lists to be obtained?**

**No list of potential subjects is to be used.**

#### **3. Will the subject be aware of why his/her name is on that list, and how and why it is being chosen from the list? How will the subject be approached--by mail, telephone, personal solicitation, etc.?**

**Subjects will be approached by personal solicitation. At the day care center, staff members will solicit parents, briefly inform them of the study, and find out if they are willing to participate. If so, they may fill out the questionnaire at that time, or take it home and fill it out and return it at a later date. Any questions regarding the study will be directed to me personally. The parents at the church nursery will be solicited by myself or a faculty from UM-Flint/church member in the same manner. My name and telephone number will be provided for any questions or concerns.**

### **E. Will it be made clear to the subject that his/her participation in, or continuation in, the research is voluntary? Will subjects be paid? If so, how much?**

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**The voluntary status will be stated in the disclosure, and subjects will not be paid.**

## **RESEARCH PROCEDURES**

**A. Give a brief description of the procedures to be used in the research project: (attach an additional sheet, if needed).**

**A convenience sample of subjects will be obtained from a day care center and a church nursery in the Genessee County area based on eligibility criteria as discussed above and willingness to participate. At both sites, eligibility criteria will be determined in the demographics section of the questionnaire. Participants will be informed of the study briefly verbally and in the disclosure. They will be asked if they would like to participate in the research by completing a short questionnaire regarding their attitudes towards health care for their children. Questionnaires will be examined with respect to demographic information and attitudes towards antibiotic use. This 11-item attitudes towards prescribing scale has been used in previous studies (Cronbach's alpha=.91). A t-test will be used to determine if differences in responses between the two groups are significant.**

**B. Does this study involve any of the following procedures:**

	<b>Yes</b>	<b>No</b>
<b>Deception of subject</b>	_____	<u>  <b>x</b>  </u>
<b>Punishment of subject</b>	_____	<u>  <b>x</b>  </u>
<b>Use of drugs in any form</b>	_____	<u>  <b>x</b>  </u>
<b>Electric shock</b>	_____	<u>  <b>x</b>  </u>
<b>Interviewing of children</b>	_____	<u>  <b>x</b>  </u>
<b>Deliberate stress production</b>	_____	<u>  <b>x</b>  </u>
<b>The handling of <u>any</u> money by the subject</b>	_____	<u>  <b>x</b>  </u>
<b>Any procedure that might be regarded as invasion of privacy</b>	_____	<u>  <b>x</b>  </u>

**If the answer to any of the above is yes, please explain this aspect of the procedure in detail: (attach an additional sheet, if needed).**

**Asking parents questions regarding their attitudes and beliefs about the health care of their children may be considered an invasion of privacy. However, participation in this study is completely voluntary, therefore, if parents view the questionnaire as an invasion of privacy, they can choose not to complete it, and refuse to participate in the study.**

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#### **IV. DISCLOSURE PROCEDURES:**

- A. Give text of your initial instructions to subjects: (attach additional sheet, if needed).**

**My name is Teri Kinney and I am a Registered Nurse pursuing my Master's Degree at the University of Michigan-Flint. I am currently working on my master's thesis, which involves research on parental attitudes and beliefs about health care for their children. In my study, I will be using the following questionnaire to evaluate these attitudes and beliefs. Your participation includes filling out this questionnaire only. Your participation is completely voluntary, you may withdraw at any time without question. Your participation is also anonymous. You may leave your name and address if you wish to receive the results of this study upon it's completion. Otherwise, do not leave your name. Any names provided will not be reported in the final research. If you have any questions or concerns regarding this project, you can contact me at 810-655-2971. I thank you for your participation.**

- 1. Does this include a full disclosure of your purpose? If not, why?**

**My purpose is not disclosed due to the fear of the Hawthorne effect. . If parent's know that I am specifically examining attitudes about antibiotics with respect to their child's status in day care, they may answer differently.**

- 2. How will it be made clear to the subject that:**

- a. his/her participation is voluntary**
- b. (s)he may withdraw at any time without penalty**
- c. responses will be kept confidential; subject will not be identified in any reports based on this study?**

**All of these are addressed in the initial instructions to subjects.**

**NOTE: If you are attaching supporting documents (i.e., research proposals, consent forms) to this request in response to any of the above items, you must flag the specific location of that item in the attachment on each page.**

**B. Final report to subjects:**

- 1. What concluding comments will be made to the subjects upon termination of the research project (attach additional sheet, if needed)?**

“Thank you for your participation in this study” and “do you have any questions”. Also, at the end of the questionnaire, it will be written: Your participation in this study is greatly appreciated. This type of research helps health care providers gain an understanding of a parent’s perspective regarding the health care their child receives, so that they may better meet your child’s needs. Thank you for your time.

- 2. When are these comments to be made? If not immediately after the research project, why not?**

They will be made as participants turn in their completed questionnaires, as well as written at the end of the questionnaire.

- 3. Will there be a report to the subjects on the results of the research? If not, why? If so, how will this be presented: in person? by telephone? other?**

Participants will be given the option of leaving their name and address if they would like a copy of the final research. They will be mailed one upon completion of the study.

**V. I have reviewed this proposal and approve the procedures to be used in the research project as stated above.**

*DR Thomas C. Schaal*

\_\_\_\_\_  
Signature of principal investigator or sponsor

*Associate Professor*

\_\_\_\_\_  
Position *Committee Chair*

*7/5/00*

\_\_\_\_\_  
Date

\*\*\*\*\*

NOTE: If you are attaching supporting documents (i.e., research proposals, consent forms) to this request in response to any of the above items, you must flag the specific location of that item in the attachment on each page.

**APPROVED BY THE REVIEW COMMITTEE ON THE USE OF HUMAN  
SUBJECTS IN RESEARCH**

**Date of Approval** July 2000

**See attached Human  
Subjects Committee Approval  
Letter**

**If substantive modifications occur which change the answers to the above questions,  
the Committee should be so informed. It will then consider whether to undertake a  
new review.**

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retyped 10/26/98

**NOTE: If you are attaching supporting documents (i.e., research proposals, consent forms) to this request  
in response to any of the above items, you must flag the specific location of that item in the attachment on  
each page.**

THE UNIVERSITY OF MICHIGAN - FLINT

July 20, 2000

To: Tom Schaal, Nursing Department

From: Suzanne Selig, Chair, Human Subjects Committee



Re: Parental Attitudes Towards Antibiotic Use for their Children: A Comparison Between Parents Whose Children Attend Day Care and Parents Whose Children do not Attend Day Care  
(Approval #73/99)

This is to inform you that your proposal "Parental Attitudes Towards Antibiotic Use for their Children: A Comparison Between Parents Whose Children Attend Day Care and Parents Whose Children do not Attend Day Care" has been approved by the Human Subjects Committee. Should you decide to make any changes in the use of human subjects which differ from the approved proposal, please advise this committee prior to making these changes.

Should you observe any negative change in the health or behavior of a human subject attributable to this research, you are required to suspend your project. If this happens, please inform the committee as soon as possible for our further review and decision as to the continuation/termination of your project.

This approval for your project is valid for a period of twelve months. If your project extends beyond this period (twelve months), please re-submit your proposal for reconsideration.

My name is Teri Kinney and I am a Registered Nurse pursuing my Master's degree at the University of Michigan—Flint. I am currently working on my Master's thesis, which involves research on parental attitudes and beliefs about health care for their children. In my study, I will be using the following questionnaire to evaluate these attitudes and beliefs. Your participation in this study is completely voluntary, you may withdraw at any time without question. Your participation is also anonymous. You may leave your name and address only if you would like the results of this study upon it's completion. Otherwise, do not leave your name. Any names provided will not be reported in the final research. If you have any questions or concerns regarding this project, you may contact me at 810-655-2971. I thank you for your participation.

**Please circle the answer that best applies or fill in blanks.**

**Age** 20-25 26-30 31-35 36-40 41-45 46-50 51-60

**Race** caucasian african-american hispanic asian native american other

**Sex** male female

**Marital Status** single married divorced separated widowed

**Education** less than high school high school diploma/GED associate's degree  
bachelor's degree master's degree doctoral degree

**Household income** less than \$30,000 \$30-60,000 \$60-100,000 \$100-200,000  
greater than \$200,000

**Number of children** \_\_\_\_\_

**Number of children living at home** \_\_\_\_\_

**Occupation:** \_\_\_\_\_

**Occupation of spouse:** \_\_\_\_\_

**Type of insurance:** \_\_\_\_\_

**Household:** single-parent two-parent

**Type of childcare:** home with parent home with babysitter

Family(household) daycare with less than 2 other children

Family (household) daycare with more than 2 other children

Daycare center

**If your child attends daycare:**

How long has your child attended daycare? \_\_\_\_\_

How many hours per week does your child attend daycare? \_\_\_\_\_

We would like to know some of your opinions about the treatment of colds and illnesses IN GENERAL. Beside each statement below, circle the number to indicate whether you strongly agree, somewhat agree, are uncertain, somewhat disagree, or strongly disagree. There are no right answers, we just want to know your opinions.

CIRCLE ONE NUMBER ON EACH LINE

<u>Disagree</u>	<u>Strongly Agree</u>	<u>Somewhat Agree</u>	<u>Uncertain</u>	<u>Somewhat Disagree</u>	<u>Strongly</u>
a. The side effects from antibiotics are worse than the illness.....1	2	3	4	5	
b. Most colds will get better faster if treated with an antibiotic.....1	2	3	4	5	
c. When my child is ill, I usually give him/her one kind of medicine or another.....1	2	3	4	5	
d. Antibiotics do not have any side effects.....1	2	3	4	5	
e. I worry that if my child takes antibiotics too often, they will stop working.....1	2	3	4	5	
f. If my child doesn't get a prescription today, he or she will be sick longer.....1	2	3	4	5	
g. Doctors often give prescriptions when they are not really necessary.....1	2	3	4	5	
h. Most illnesses cure themselves without having to go to the doctor.....1	2	3	4	5	
i. If my child has a cold or cough, taking an antibiotic is the best way to get rid of it.....1	2	3	4	5	
j. If you do nothing for a cold for more than a week, it can turn into something really serious.....1	2	3	4	5	
k. If the doctor does not give my child a prescription, I feel I have wasted his/her time.....1	2	3	4	5	