**Level of Health Literacy and Parent/Guardian Asthma Knowledge**

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**Purpose:**

Despite advances in asthma management, childhood asthma remains one of the highest ranked causes of pediatric hospitalizations and school absences. Health literacy studies show that because of low health literacy, the parent/guardian often does not understand the need for asthma prophylactic therapy, does not demonstrate the proper use of the asthma metered-dose inhaler, and lacks comprehension of written material. Health care providers do not routinely assess the parent/guardian for the ability to read and comprehend written material.

This study examined the relationships between the parent's/guardian's level of functional health literacy (FHL) and their capacity to manage their child's asthma. The following questions were raised:

1. Research Question 1: Does the level of functional health literacy predict asthma knowledge among parent's/caregiver's of children with asthma?
2. Research Question 2: Does the level of functional health literacy predict asthma knowledge among parent's/caregiver's of children with asthma?
3. Research Question 3: Is there a relationship between the level of functional health literacy and parent/caregiver demographic variables (age, income, education completed, race/ethnicity, previous asthma education) of children who have been diagnosed with asthma?

**Methods:** Orem's Self-Care Deficit Nursing Theory propositions maintains that self-care is a deliberate action performed with the intent of doing well for a dependent, but the action preformed may be inadequate due to lack of knowledge and skills. Self-care/dependent care agency can be described in terms of development, operability, and adequacy. IRB approval was obtained. Parents were first contacted using a flyer and gaining verbal consent to study. Signed consent was obtained after explaining the data collection process. The asthma clinic and health department in two states were the primary locations. Private space to conduct the surveys was provided at the locations and took place during the child's visit. A descriptive correlational design was chosen to describe the variables under study and to determine the relationship between the parent's level of functional health literacy and their asthma knowledge. Instruments used were demographic and health status questions, Asthma Knowledge-Parent (AKP), and Test of Functional Health Literacy-Adult (TOFHLA). The statistical techniques used to analyze the data included calculation of descriptive statistics, frequency tables, t-tests, correlational analysis, and regression model. The design provided sufficient data for analysis of relationships among the variables under study. The primary predictive variable for this study was the level of functional health literacy of the parent/guardian. Fifty-eight (58) parents/guardians who self-identified as having a child with asthma who was 0-9 years of age completed the surveys. This age group of children was chosen as it is the expectation that the parent/guardian would be responsible for the child's health maintenance.

**Results:**

Since the Functional Health Literacy (FHL) scores were of primary importance in this research, t-test was conducted to determine if FHL scores were significantly different between the groups. A significant difference was not shown between the mean Health Literacy scores of those adults smokers versus nonsmokers; adults who had completed an asthma education program versus those who had not; adults whose child had been hospitalized for asthma during the last year, versus adults whose child had not been hospitalized; and, adults whose child had been taken for an unscheduled office visit for asthma in

the last year, versus adults who had not taken their child for an unscheduled office visit for asthma. All participants (n=58) scored within the adequate level of functional health literacy.

A stepwise regression approach was also used to develop the most parsimonious model of the predictors of FHL scores (age, education, AKP, and health status outcomes). The F to enter was set at $p<.15$ and the F to remove was set at $p<.25$. In the analysis, an entry criterion of 0.15 was used so if the p-value for the variable of interest was less than 0.05, then it was added to the model. There was a slight association of parents/guardians with a higher FHL score were able to prevent their child from having to be hospitalized for asthma related symptoms, whereas those parents/guardian who had a lower FHL score was unable to prevent this from happening. Almost one-fourth of the sample incorrectly answered 5 or more of the Asthma Knowledge questions, and 4 (7%) said they did not know the correct answer to 10 or more of the questions.

**Conclusion:**

Preliminary evidence that the level of FHL does predict asthma knowledge among persons who provide care for children with asthma. While not definitive in all aspects, supports the premise that the FHL scores do in part explain health outcome measures. Additionally, higher income of the participants entered the regression model as a significant variable in predicting their score on the FHL. The most troubling methodological limitation of this study was the unexpected failure in being able to recruit participants who scored in the inadequate range of the TOFHLA.

However, lower-literacy parents with low literacy skills may not have been able to read and interpret the information on the recruitment flyer, or they may have been self-conscious or fearful that their participation in the study might lead to the discovery that they did not know how to read.

These findings are a clear indication that asthma education is not reaching the public as it should and confirms the urgent need for more extensively available programs of education to help parents know what to do to address the onset of an asthma exacerbation before it becomes a crisis that requires immediate medical attention. Health literacy problems have increased as the health system has grown more complex. Health literacy implies the accomplishment of certain health information knowledge, skills and competence to provide for and improve self-care and dependent care.

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**Title:**

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**Keywords:**

Test of Functional Health Literacy, asthma knowledge and health literacy

**References:**

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**Abstract Summary:**

The purpose was to use Orem's Self-Care Deficit Nursing Theory to examine the relationships among level of health literacy, asthma knowledge, and the ability of parents/guardians to care for asthmatic children.

**Content Outline:**

**I. Introduction:**  This research presentation is focused on the impact of health literacy of parents or caregivers on their ability to manage the care of their child who have asthma. Health literacy is the degree to which an individual has the capacity to gain, process, and understand basic health information.

A. The level of health literacy is a crucial link between health and health education. As child with asthma is dependent on the parent/guardian to read a medication bottle, measure the correct dose, complete a health record, or to get them to the right appointment, it is important for health-care providers to assess for level of health literacy and to provide health information at the appropriate level. In a study on literacy, 5% of the US population were illiterate and 22% had substantial difficulty using basic reading, writing, and computational skills at a level adequate to function in society.

B. The consequences of inadequate health literacy are increased health care cost, lack of understanding, and failure to use preventive services. A study showed that patients with poor self-care were less

prepared to avoid triggers, manage medications, monitor symptoms and use inhalers and peak flow meters than patients with higher health literacy

C. Asthma, a chronic inflammatory disorder of the airways that is complex, requires precise monitoring of expirations and accurate medication administration. Childhood asthma remains one of the highest ranked causes of pediatric hospitalizations and school absences in the United State. Parents have reported being uncertain about administering medications and respiratory treatments.

D. An essential component in promoting health and preventing disease is health education. The Joint Commission's National Safety Goals addressed effective communication between provider and patient as a safety goal.

E. Orem's Self Care Theory: The theory of self-care propositions maintains that self-care is a deliberate action performed with the intent of doing well for self or dependent, but the action preformed may be inadequate due to lack of knowledge and skills. Within Orem's theoretical framework, dependent-care agency can be examined in relation to the skills and knowledge that individuals have to care for another

F. This study examined the relationships between the parent's/caregiver's level of functional health literacy and their capacity to manage their child's asthma.

1. Research Question 1: Does the level of functional health literacy predict asthma knowledge among parent's/caregiver's of children with asthma?

2. Research Question 2: Does the level of functional health literacy predict asthma knowledge among parent's/caregiver's of children with asthma

3. Research Question 3: Is there a relationship between the level of functional health literacy and parent/caregiver demographic variables (age, income, education completed, race/ethnicity, previous asthma education) of children who have been diagnosed with asthma?

**II. Methodology**: A descriptive correlational design is consistent with the non-experimental nature of the study and included no manipulation of variables. The design provided sufficient data for analysis of relationships among the variables under study. The primary predictive variable for this study was the level of functional health literacy of the parent/caregiver. The level for functional health literacy was derived from the comprehensive score of numeracy and reading on the Test of Functional Health Literacy for Adults (TOFHLA). The criterion variable for which the level of functional health literacy score was compared was the asthma knowledge score. The sample was described according to health outcomes and demographic variables. Adult participants were recruited in two pediatric asthma clinics and two health departments in North Carolina and Up-state New York.

A. A demographic questionnaire, test of asthma knowledge survey and the TOFHLA were used to gather data in face-to-face interviews. TOFHLA measured health literacy skills including both reading comprehension and numeracy. It has two parts, a 50-item reading comprehension and a17-item numerical assessment. It is a valid, reliable indicator of one's ability to read and comprehend health–related materials.

B. The psychometric properties of the Asthma Knowledge-Parent survey support the internal consistency and discriminant validity of the tool. It has a fourth grade readability level using the Flesch-Kincaid Grade Level Quotient. All of the questions are in a multiple-choice format with the exception of the medication section, in which the medications were listed

C. IRB approval was granted. Parents/guardians of children with asthma were seen in the asthma clinics and health departments in urban and rural communities. The health status of the child was obtained by

asking the parent/guardian if the child had been taken to the emergency department, hospitalized for asthma, or had been taken for any unscheduled office visits for asthma related symptoms during the past year.

III. **Data Collected:** Data were entered by the investigator into Microsoft Excel and then imported into Statistical Analysis with SAS/STAT® Software. Nonparametric test procedures were used to test the effects of the independent variable, the TOFHLA score, on the dependent variables, i.e. the asthma knowledge score, health status, and demographic variables. The statistical techniques used to analyze the data included calculation of descriptive statistics, frequency tables, t-tests, correlational analysis, and regression model. A convenience sample was obtained consisting of 58 parents/guardians who self-identified as having a child with asthma who was 0-9 years of age.

**IV. Research findings:**

A. The Functional Health Literacy (FHL) scores were of primary importance in this research, t-test was conducted to determine if FHL scores were significantly different between the groups of interest. The group sizes for the various variables varied. If an individual has less than a high school degree, then their predicted FHL score will be 5.22 points lower than an individual who has a high school degree or is further educated. The hospital indicator variable is 1 if the child has been hospitalized for asthma within the last year and zero otherwise. This means that the predicted FHL score will be 4.02 points lower for an individual whose child has been hospitalized for asthma within the last year. Although association does not imply causation, it could be the case that the parents/guardian with a higher FHL score are able to prevent their child from having to be hospitalized for asthma related symptoms, whereas those parents/guardians who have a lower FHL score are unable to prevent this from happening.
B. It is recommended that in future studies the sample size be increased so that more information can be considered when looking at the various models that are possible.

**V. Conclusion and Implications for clinical practice**

A. The independent variable, level of functional health literacy, was found to have all participants scoring within the adequate level of functional health literacy.

1. RQ 1 A statistically significant relationship was found between the participants' FHL scores and their scores on the 23-item basic asthma knowledge test (p=.0373). In addition, a significant correlation was found between FHL and the number of correct answers to the variable of knowledge related specifically to use of the nebulizer (p=.0105). These findings provide preliminary evidence that the level of FHL does predict asthma knowledge among persons who provide care for children with asthma.

2. RQ 2 A significant correlation was demonstrated between FHL and the variable of income (p=.0511), in that participants with higher incomes scored significantly higher on the FHL test.

3. RQ 3 Regression Model 3, where S = 77.45 + 1.36 x income + 3.81 x Q4 (nebulizer) + 5.61 (smoke) - - 5.22 x I (hospital), would suggest that the FHL score does partially explain the effect of the health outcome measures of interest, in terms of: l) caregiver smoking, 2) number of hospitalizations and 3) capacity for management of the nebulizer. This finding, while not definitive in all aspects, supports the premise that the FHL scores do in part explain health outcome measures.

B. Perhaps the most important finding in terms of immediate clinical application is the finding that 91.4% of even the highly literate well-educated participants in this study reported that they had never completed an asthma education program. This finding reveals a serious and perhaps previously unrecognized gap in the availability of asthma education programs, with immediate implications for the community health services that interface with caregivers of children with asthma.

C. It is also noteworthy that even though the entire sample scored at an adequate level of FHL, almost one-fourth of the sample incorrectly answered 5 or more of the Asthma Knowledge questions, and 4 (7%) said they did not know the correct answer to 10 or more of the questions.

D. A stronger system of community based education for individuals who care for children with asthma could significantly decrease the health care costs associated with asthma management for children, and improve the health-related quality of life for the parents and children involved.

**VI. Limitation** the recruitment strategies failed to enroll even one participant who scored within either the inadequate or marginal range of the TOFHLA. Clearly, more effective recruitment strategies need to be designed for future studies, but the successful development of such strategies will obviously depend on innovative approaches for obtaining the sample, rather than convenience sampling.

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**Professional Experience:** I have been a registered nurse for over 42 years. I completed my PhD in rural health nursing from Binghamton University, NY. My research interest and work has been with parents of children with asthma and clear communication. I am a nurse educator, teaching community health nursing at the baccalaureate level to both pre-licensure and post-licensure students.
**Author Summary:** Dr. Evelyn Hoover has practiced nursing providing care across the lifespan in acute care and home care settings. Currently, she teaches community health nursing where she challenges her students to also know the patients level of health literacy and to tailor patient education to meet patient needs.