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THE DEVELOPMENT OF AN ASSESSMENT AND TEACHING TOOL FOR THE
ASSESSMENT OF NUTRITIONAL STATUS IN PRESCHOOL AGE CHILDREN IN
PRIMARY CARE FOR USE BY ADVANCED PRACTICE NURSES

By

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ABSTRACT

THE DEVELOPMENT OF AN ASSESSMENT AND TEACHING TOOL FOR THE ASSESSMENT OF NUTRITIONAL STATUS IN PRESCHOOL AGE CHILDREN IN PRIMARY CARE FOR USE BY ADVANCED PRACTICE NURSES

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The assessment of nutritional status in preschool age children in a primary care setting is a difficult task for advanced practice nurses. For this scholarly project, an assessment and teaching tool was developed for use with preschool age children. Preschool age children are children aged three to five years. Guidelines are based upon the literature focusing on nutritional status for this age group and techniques of assessment. Plans for follow up in primary care settings with the use of this tool are presented, including implementation, staff development, and follow up, and the implications of this assessment and teaching tool for professional nursing, advanced nursing practice and primary care are discussed.

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Introduction

Assessment of nutritional status in the preschool age child presents a unique challenge for both healthcare practitioners and parents alike. Decision making and food choices by this young population tend to be impulsive and constantly changing. Fruit and vegetable choices tend to be sporadic and most often are substandard for age (Boaz, Ziebland, Wyke, & Walker, 1998). Dietary intake is systematically underreported, especially in overweight children (Johnson-Down, O'Loughlin, Koski, & Gray-Donald, 1997). Due to the accelerated individual physical growth of this population, nutritional needs are high at this age. Nutritional assessment in primary care is important for improving patient care and improving clinical outcomes. Healthful diets help children grow, develop, and do well in school (United States Department of Health and Human Services [DHHS], 1995). Health assessment and intervention for the preschool age child is crucial for the prevention of future health problems such as diabetes, obesity, and growth retardation (Raymond & D'Eramo-Melkus, 1993). Many genetic, environmental, behavioral and cultural factors can affect diet and overall health (DHHS, 1995). Traditionally, for children as well as adults, in depth assessment of nutritional status does not take place until inpatient hospital admissions or with the occurrence of chronic disease, where dietetic screening and

nutritional support services are available. (Baer & Harris, 1997; Deatrick and Lipman, 1998; McMahon, Decker, & Ottery, 1998). In the past, assessment guidelines for nutritional status in primary care have traditionally been general and nonspecific to age or to food choices. In 1994, health care practitioners received new nutritional guidelines for management of nutritional status in the absence of a registered dietician for ages two and up (Freeman, 1998). Prior to this, tools have traditionally neglected snacks or nontraditional food servings and preparation. Some sensitivity to these issues is now starting to be addressed in new guidelines (DHHS, 1999).

This scholarly project addressed the problem of early assessment of nutritional status in primary care for preschool age children and their caregivers. Specifically, attention was paid to assessment of fruits and vegetables as a hallmark indicator of overall nutritional status. The primary care setting was used as a means for early identification and intervention with potential nutritional problems. Post assessment teaching will also be addressed in the form of a teaching tool and handout.

Between 5% and 25% of children and teenagers have a nutritional deficit ranging from obesity to malnourishment (Dietz, 1993). It is estimated that 5-7% of white and black children are obese, while 12 percent of Hispanic boys and 19

percent of Hispanic girls are obese (Office of Maternal and Child Health, 1989).

Having multiple medical problems in conjunction with this nutritional imbalance is also not uncommon. The Healthy People 2000 guidelines identify for the practitioner the goal of improved child and adult nutrition by the year 2000.

Specifically, the largest goal is to institute healthy eating patterns for children, and to avoid the problem of childhood obesity and its implications on the adult diseases of hypertension, cardiovascular disease, and stroke (DHHS, 1999).

Looking ahead to the year 2010, goals of healthy eating and childhood nutrition have also been reiterated (DHHS, 1999). Action on nutritional assessment and intervention to achieve these goals occurs in the primary care setting.

Nutritional deficiency and questionable adequacy of nutritional assessment in children is widespread and can be linked to decreased familial education and decreased familial socioeconomic status (Johnson-Down et al., 1997). Currently, many children fall into the category of being nutritionally deficient, or of being growth or mentally delayed related to nutritional deficits. If nutritional deficiencies are allowed to go untreated, they can result in obesity, growth retardation, metabolic imbalances, or altered or delayed development. Eventually, overall functioning and achievement are affected having lifelong implications. By ensuring an adequate variety and intake of food choices, greater insurance can be

made that adequate nutritional status is being met. Better nutrition leads to better health outcomes.

Statement of the problem

Previous assessment of nutritional status in preschool age children in primary care has been done by linear height and weight tables, or by body mass index (BMI). These both usually use age and gender specific percentiles. Unfortunately, these assessments only measure the outcome of nutrition, and not the adequacy of nutritional intake. This can lead to delays in intervention until severe discrepancies arise. Additional problems in nutritional assessment include varying portion size representation from person to person, subjective recall of food choices with limited time frames, routine underestimation by children of intake on diet records and the lack of culturally sensitive assessment tools designed to meet the needs of different ethnic groups (Champagne, Baker, DeLaney, Harsha, & Bray, 1998). Also, the desire to adhere to social dietary norms and expectations may further impede accurate assessment and results, especially in the older child and adult (Johnson-Down et al., 1997). Furthermore, the limited contact with the preschool age child in the primary care setting leaves assessment to a general overview of previously used developmental milestones, and not specifically targeting the area of nutritional assessment. The limited time frame in primary

care, usually fifteen minutes per visit, further complicates the proper assessment of proper food choices and nutritional education. Curriculum for the advanced practice nurse usually contains a cursory review of nutritional needs, let alone specificity to the age group of the pre school age child. A general low level knowledge of nutrition also contributes to a decreased level of knowledge regarding nutritional assessment (Baer & Harris, 1998). Therefore, the advanced practice nurse is generally left with few references for nutritional assessment and teaching for the preschool age child and caregivers. The challenge remains to sensitize clinicians to the need for ongoing accurate nutritional assessment and teaching in the young pediatric client.

A significant number of advanced practice nurses may be unaware of nutritional assessment or teaching tools for use in primary care. Researchers in the area of nutrition stress the need for early assessment and intervention to prevent future complications in the pediatric population (DHHS, 1999). A need for early, specific and well delineated nutritional assessment exists, as well as implications for future care of the preschool age population. It is the responsibility of all health care providers to be able to identify children at nutritional risk, intervene when appropriate, and refer to nutritional services when necessary. The purpose of assessment is to identify children at risk for nutritional problems, referral of more

severe problems, and to provide anticipatory guidance for prevention of nutritional problems (Baer & Harris, 1998)

Project Description

Because many advanced practice nurses are practicing in the area of primary care of children and their caregivers, these nurses need an effective plan for assessing nutritional status in the young child. Therefore, the purpose of this scholarly project was to develop an assessment and teaching tool to give advanced practice nurses in a primary care setting a resource for use with preschool age children and their caregivers.

The screening tool developed was based on the professional literature related to nutritional assessment and pediatric nutritional care. Because of the focus of this project, assessment and teaching was focused on preschool age children in conjunction with their caregivers. The caregivers include the parents as well as extended family, day care providers, and other primary caregivers for the pre school age child. Suggested interventions for the management of discerned nutritional deficiency are reviewed.

The assessment and teaching tool was focused on the assessment of nutritional status, rather than on discussion of overall health or functioning.

Although the prevention of deficiency in performance or functioning related to nutritional status is the ideal goal, attention to this outcome may not be feasible in the initial limited time frames of the primary care assessment and screening visit. Rather, follow up and referral of the identified problem and beginning teaching with basic nutritional information are the goals for the advanced practice nurse.

Conceptual framework

The conceptual framework used for this project was the Health Outcome Model by Starfield (1996). Starfield identifies the health services system as being comprised of three types of components; structure, process, and outcome. Starfield allows that individual characteristics will vary from place to place and from time to time, but describes an overall process for primary care and its practitioners. Figure 1 shows a graphic illustration of Starfield's model. Starfield also gives the opportunity to use parts of the model in application.

Structure is defined as the resources needed to provide specific services as well as the setting. Process is described as the activities of both the providers of care and the target population. The interaction with care and providers is also seen as an important part of the central process. The impact of the process is seen as outcome of care in the health services system. The outcome section can focus on

the individual as well as the community, and measures levels of health status. The goal of this model is to clearly link the primary care structure to specific outcomes through a measurable, delineated process. While Starfield states that all areas of the model are specifically distinct, she also notes the ongoing interrelationships of each section.

Application of Model to Project

Structure In general, the model in Figure 2 is seen as a linear progression of the structure of the advanced practice nurse in the primary care setting targeting the preschool age child and family through the process of assessment with the outcome of identification and intervention of nutritional needs. The structure, seen at the top of the model in Figure 2, includes the APN, preschool age child, caregivers, family, and the primary care setting. These elements form the basis and foundation of the model. These are the resources needed to provide the application of the screening and teaching tool. Different cultures as well as different educational and socioeconomic levels should be considered as providing a varying initial foundation.

A screening tool is defined as a tool used to determine where an individual falls in comparison with established norms or minimum criteria for a

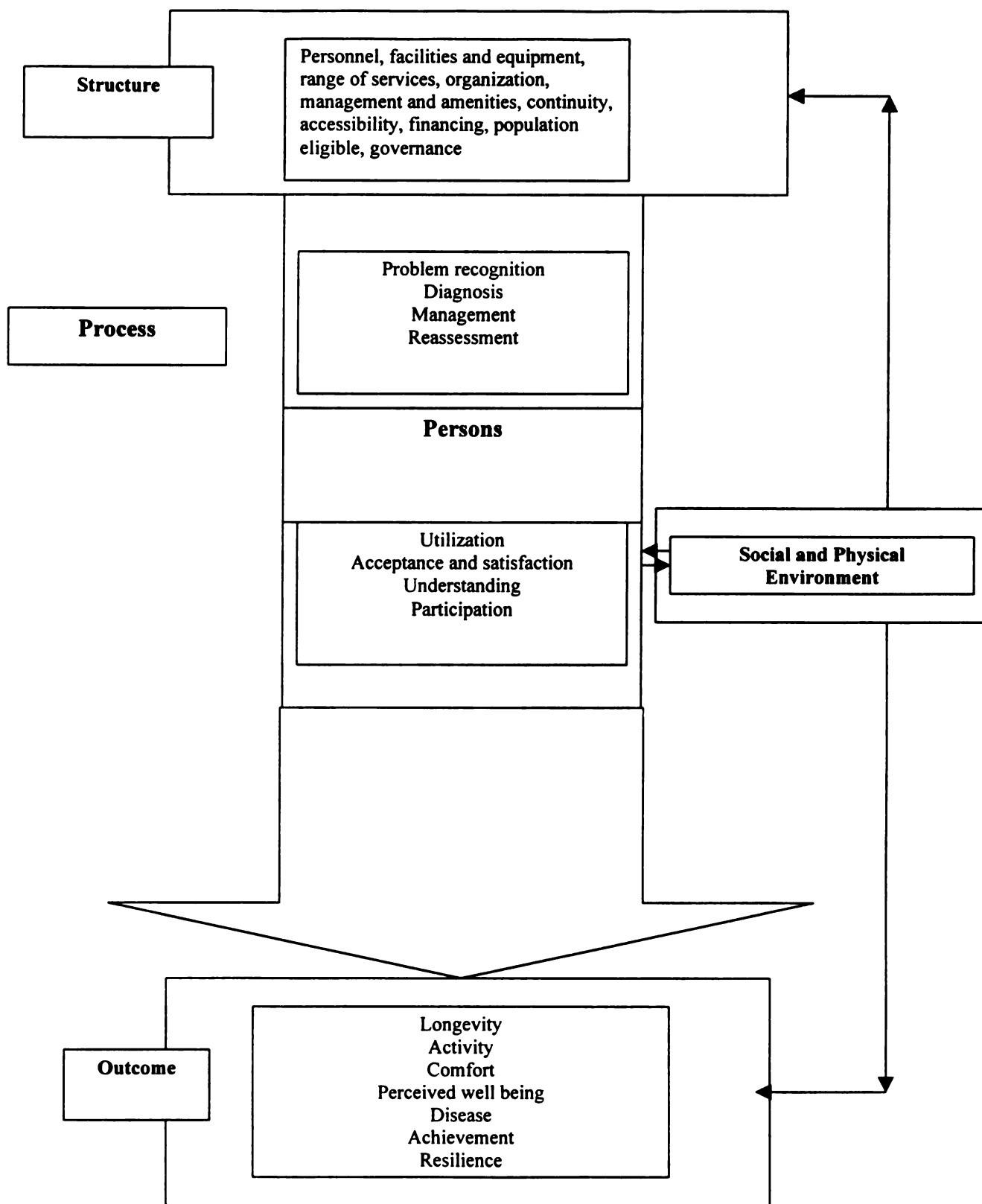


Figure 1. Health outcome model by Starfield. (1996).

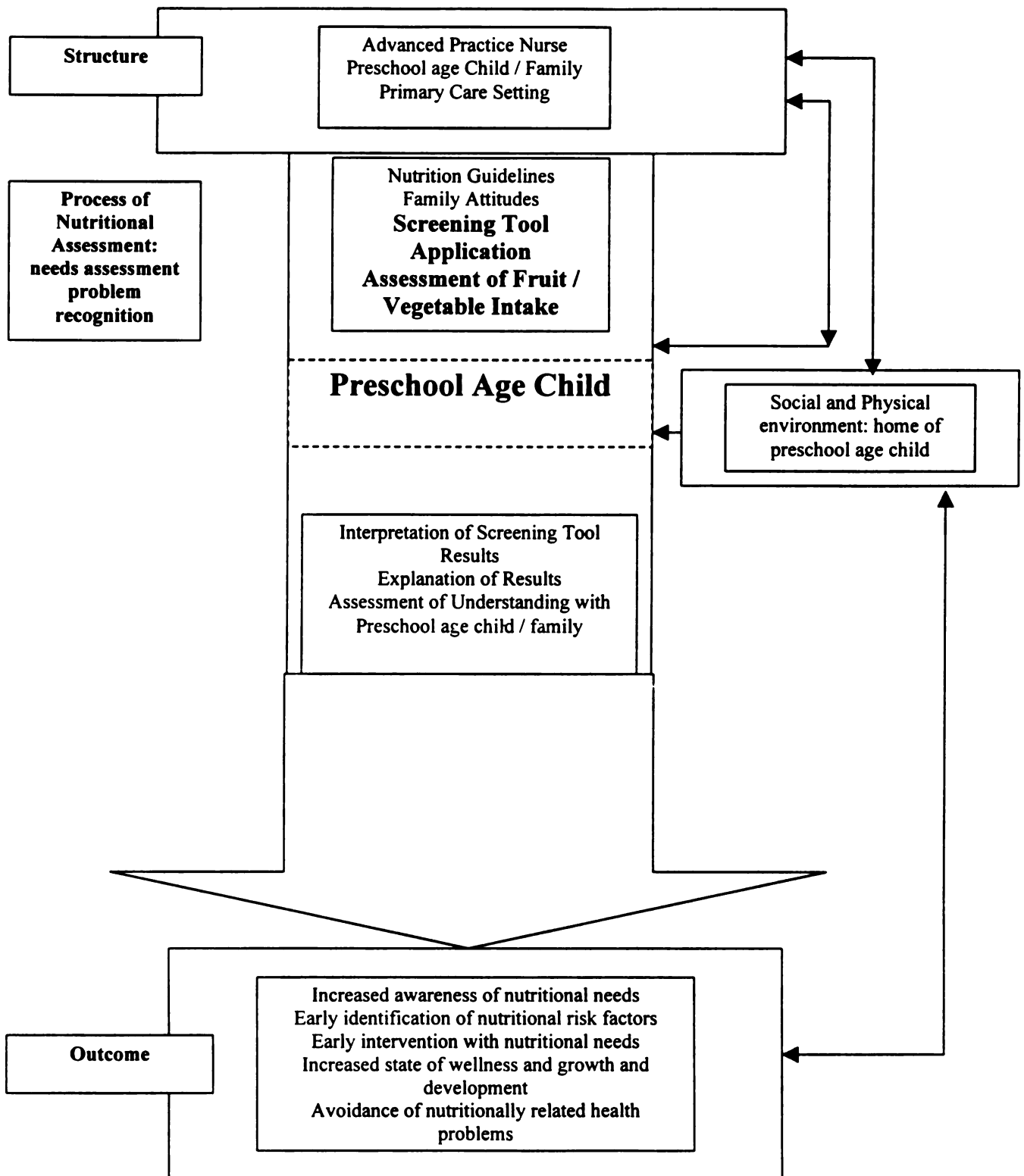


Figure 2. Application of dynamics of health outcome model by Starfield to nutritional assessment in preschool age children in primary care.

subject. In the application of the Health Outcome Model, the assessment tool is seen as a rectangular box corresponding as a part of the process, and a component of problem recognition. At this basic level, the physical environment of the setting must be considered as well as the dynamics of the personnel involved. Both the social and physical environment are considered as part of the process. Details in the social and physical environment can contribute to or detract from the process of application of the assessment and teaching tool. The preschool age child is generally defined as the child aged 3-5 years of age (Plum, Hertzler, Bruschetti, & Stewart, 1998). The preschool age child in the model is seen as the focus of the process of assessment, and the target population or the central rectangular box. The preschool age child in this project also includes the child's parents, family, and/ or caregivers as part of the process and focus of assessment. The preschool age child as delineated also is affected by the social and physical environment, as demonstrated on the right of the model by a rectangle box. This environment is not only the home of the preschool age child, but also the social environment of the family and caregivers as well as secondary environments of school, peers and recreation, and the broader environment of culture and ethnicity. There is flow between the environment and child, as seen by the bidirectional arrows linking both. The environment is included in the model but will not be specifically

targeted by this scholarly project.

Process The process in Figure 2 is outlined by a rectangular box on the left side of the model. Process in this project includes recognition of the problem as well as needs assessment. This is the central focus of the project, and the focus of the attention of the advanced practice nurse. In the application of the model to the project, the process, which includes application of the assessment and teaching tool, represents the activities of the advanced practice nurse with the target population of preschool age children and caregivers. Shown in Figure 2 as a rectangle above the preschool age child, this process of application of the assessment and teaching tool must take into account nutritional guidelines and family attitudes as well as the tool itself for accurate assessment of the nutrition of the target population.

Outcome The rectangular box under the preschool age child represents the second part of the process; interpretation and management of results of the screening tool application. At this point, the APN is also involved in the process of education and explanation of results with the preschool age child and the caregiver. From this it can be inferred that the preschool age child and caregivers also progress through a process of understanding and problem recognition through the application of the assessment and teaching tool. This project does not specifically

include outcomes management but outlines the followup process.

Flow between structure and process is seen by bidirectional arrows from the structure to the environment, as well as to the process of the model. These represent a working and changing relationship between these first two stages of the model. As structure changes, and as environment changes, the APN must consider these as influencing factors to the process of the tool application. Likewise, the application of the tool would have a potential impact on the preschool age child, the caregivers, and the environment.

The model goes on to show a progression through the process of nutritional assessment to the outcome of interpretation of the screening tool results, seen as a rectangle below the central process boxes. Outcome can be seen as an impact on health care status of the preschool age child and caregivers. There are many ways to consider positive outcomes in health care delivery, and are seen here as not only increased awareness of health care needs, but also as early identification and intervention with nutritional needs. An optimal outcome is listed as an increased state of wellness for the preschool age child, as well as avoidance of nutritionally related problems. There is also a flow from the outcome to the environment, as seen by bidirectional arrows linking both sections. This strength of the model can be explained as seeing an effect not only of the

environment on the outcomes of the process, but also of the outcomes as having an effect on the social and physical environment of the preschool age child.

This linear, unidirectional model terminates in the ultimate outcome of increased understanding of nutritional needs, identification of risk factors, and an increased state of wellness for the subject of the preschool age child. This should be the goal of not only the APN, but of the preschool age child and caregivers as well in the primary care setting.

Literature Review

The purpose of this section is to present a review of the literature related to nutritional needs, decreased nutritional status and its effects, assessment of nutritional status, and application of nutritional assessment and screening for preschool age children in primary care. Due to the lack of reference to guidelines specifically for the advanced practice nurse, literature from all disciplines was considered and included. Due to the lack of focus on the preschool age child, studies including a range of children's ages were also considered.

Nutritional Intake and Problems

Examination of the literature concerning factors related to decreased nutritional status and at risk preschool age children revealed many articles concerning the problem of childhood obesity as well as decreased nutritional

intake. In looking at preschool age children's nutritional needs and intake, Murphy, Martorell, and Mendoza (1990), reported an empirical study examining food group intake and nutrient contribution of different food groups. The Hispanic Health and Nutrition Examination Survey (HHANES) survey had a sample size of 3,436 children, and included ages 1-17, broken down into four age groups. These groups are 1-2 year old, 3-5, 6-11, and 12-17 year old children. In general, nutritional intake of breads, fruits, and vegetables were less than half of the recommended servings per day. Dairy consumption was by far the poorest in the 6-11 and 12-17 age groups. Preschool age children had the lowest consumption of breads and especially fruits and vegetables (Murphy et al., 1990). The HHANES study was limited in that it focused on Mexican-American children and also identified the problem of assessing portion size. In summary, nutritional intake is found to be less than recommended amounts and values.

Obesity, abnormal developmental levels and delayed thought processes are the major manifestations of poor or inappropriate nutritional intake. Summerfield (1996), Dwyer, Stone, and Feldmanet, (1998) and Johnson-Down et al. (1997) examined the problem of overweight children and teenagers. All focused on the growing incidence of this problem, with Dwyer et al. and Johnson-Down et al. focusing on multiethnic groups. Johnson-Down et al. (1997) also found a

correlation between lower consumption of fruits and vegetables in children of families with lower socioeconomic status. However, the Johnson-Down et al. study is limited to examination of inner city, low income children. Assessment of obesity was not detailed in all three studies. Resnicow, Smith, Baranowski, Baranowski, and Davis (1990), in a sample of 11,389 multiracial U.S. children, found a direct correlation between body mass index (BMI) and plasma total cholesterol. This study did not address specific assessment of food intake, nor did it pursue food group variances as predisposers to high cholesterol. Pollitt, Cueto, and Jacoby (1996) and Politt and Mathews (1998) related fasting and breakfast intake to cognition in schoolchildren. Both studies reinforce the theory that decreased intake directly affects attention and memory processes, although the study was limited to 9 to 11 year old children, with a higher sample percentage of female schoolchildren. Schuster (1998) specifically examined nutritional needs of 248 Latino children, but also neglected primary care assessment guidelines and did not identify specific risk factors.

These studies have a commonality of demonstrating decreased nutritional intake as well as identifying childhood obesity, but do so in general by focusing on the school age child, while neglecting the preschool age child. There is a higher and disproportionate representation of females in the studies, as well as a

higher representation of multiethnic groups, and lower socioeconomic, inner city populations. Sample sizes are adequate, but appear to be focused on the older child. Fruit and vegetable consumption was found to be low in several studies.

Assessment and Assessment Problems

There is a deficit in attention to assessment and assessment tools in the literature for use by the health care professional. Assessment of nutritional status by the primary care practitioner is difficult as seen in many studies. Special needs children received the most attention for nutritional assessment, with Deatrick and Lipman (1998) and Baer and Harris (1997) both focusing on sensitizing clinicians to the nutritional needs of special populations. Deatrick and Lipman use a small sample size of 16 to examine the energy needs of HIV infected children, while Baer and Harris propose a more general focus on community based assessment of nutrition for varying pediatric groups. Campbell and Kelsey (1994) and Plum et al. (1998) both study 3-5 year old special needs children. Campbell and Kelsey had a sample of 79 children and their caregivers (parents, grandparents, etc.) and used a self report format with the caregivers. Binary question format was used in this study, and was holistic in its assessment of varying intake methods, such as spoons, feeding tubes, bottles, etc. Campbell and Kelsey reported a correlation between problem identification by a dietician and problem identification by a

specific survey instrument. Campbell and Kelsey also mentioned good application of this method to primary care, but is limited to focusing on special needs children with attention primarily on using children with developmental problems both in the study and in the application of the survey. Plum et al. used a sample of 44 boys and girls with mixed ethnicity, and a play approach to primary reporting of nutritional perceptions. Results showed that a short assessment time was valuable, meaning that attention was sustained with accurate responses, and that daily assessment or recall of nutritional intake was more reliable than weekly reporting. Therefore, a shorter, more frequent recall was more accurate in food reporting and data collection. This study avoided examining a specific pediatric population. Champagne et al. (1998), Kristal, Andrilla, and Diehr (1998) and Lytle, Murray, Perry and Elridge (1998) all report problems with recording and assessing nutritional intake and status in the young child. Champagne et al. noticed problems between reporting in different ethnic and cultural groups, and while having a sample size of 118, targeted children with a mean age of 10 years. The study by Kristal et al. had a sample size of 192, but was limited to examination of college age students exclusively. Lytle et al. questioned whether children can accurately report consumption data, and stated that children in general overestimate fruit consumption, but accurately report vegetable consumption.

Lytle et al. provided a valuable focus on fruit and vegetable consumption, but is limited to a 24 hour recall, as well as the average age being 10 years old. Lytle et al. also focuses on the high cost for accurately assessing children in the study as to content and procedure. Detsky, McLaughlin, Baker and Johnston (1987) looked at subjective global assessment of nutritional status as related to traditional assessment in primary care. This study focused on assessment techniques of weight loss, loss of subcutaneous tissue, and muscle wasting as evidence of altered nutritional status. Morse, Hutchinson and Penrod (1998) focused on qualitative assessment in nursing, and the problems with outcomes identification using qualitative data. The point made in this article is that qualitative data must be paralleled by an equal amount of quantitative data for all nursing assessment development.

Summary

The literature reviewed shows gaps in the specific sample sizes of the preschool age child, and attention to the preschool age child, as well as little identification in the primary care setting by health care personnel. Lack of attention is seen of application of results to primary care, with most authors being dietitians and not healthcare clinicians. Most authors are studying all areas of food choices, with no reinvestigation or attention paid to the deficient categories

already identified, especially fruits and vegetables and breads. Caregivers are utilized in data collection, but with little attention to the family unit including the preschool age child as a whole, but rather with participants being examined and addressed separately. Continued focus on childhood obesity remains a manifestation after the problem of decreased nutritional status is already in place, which could be ameliorated by increased earlier assessment and problem recognition. In summary, assessment of nutritional status is limited by small sample size, lack of attention to the preschool age child, and heavier attention to special populations versus a generalized pediatric population in looking at specific nutritional assessment.

The implication of the literature review is that a need exists for APN assessment and screening for the younger or preschool age population regarding family nutritional needs in primary care settings. Focus should be on those areas already proven to be deficient, such as fruits and vegetables. Care should be taken to accurately represent all ethnic groups as well as allowing for interpretation with or without patient training as to food choices and perceptions. A need for assessment and teaching in the general well child population also exists, prior to existing disease, with obvious implications in pediatric health and development if this area of primary care is neglected or generalized.

Project Development

Outline of Assessment and Teaching Tool

The proposed assessment and teaching tool is a simple, one page tool designed to measure the fruit and vegetable intake of the preschool age child in the primary care setting. Data may be reported and recorded by the caregiver, or by other staff with evaluation by the advanced practice nurse. The time frame targeted for assessment is the previous three days rather than the usual 24 hours for increased accuracy in reporting, and includes written assessment as well as oral review of data obtained. Pictures of serving sizes and specific fruits and vegetables are used to reduce error in individual caregiver reporting and application of the tool. Consideration is made to include a simplified picture-oriented tool for aid in use with the preschool age child, allowing comparison with adult family recall. Desired servings of fruits and vegetables are addressed as an attached handout to be separated and given to the caregiver. The tool is 10 questions, and takes between 5 and 10 minutes to complete, with an additional 10 minutes for immediate follow up at the time of collection. The tool is intended to be administered during scheduled visits as part of well child assessment, and can be also used as primary assessment and problem recognition for the child not

meeting desired height and weight goals. In depth assessment of results and plan of care is addressed outside of the screening tool.

The Miller Preschool Age Child Dietary Assessment Tool (MPACDAT) is composed of an 11 x 17 piece of perforated paper, with 10 questions on the left side, and corresponding information for each question and references on the right hand side. This section describes each item on the MPACDAT. The tool and guidelines for use are included in Appendix A.

MPACDAT Format

The format of the MPACDAT is based, in part, on review of dietary questions asked in the Early Head Start (EHS) research questionnaire (EHS, 1997). Guidelines for assessment tool development described by Rankins & Stallings (1996) were also considered. Similar to many current assessment tools, the completed MPACDAT will serve as a source of documentation. However, additional documentation will need to be included to complete the nursing process, i.e., a problem list, plans for intervention with expected outcomes, and evaluation methods to be used. Space for interpretation and plan is included on the bottom of the first page of the assessment tool. The left side assessment portion of the MPACDAT along with supporting documentation should be included in the client's medical record after completion by the caregiver. The right

hand side information sheet and teaching material should be separated at the center perforation prior to use and handed to the caregiver and client after review.

The MPACDAT begins on the left hand side with space provided for identifying data, including the inclusion of both the client name and age at the time of review, caregiver's names, the date of review of the MPACDAT, and the name of the reviewer. Short directions are included at the top of the MPACDAT. Ten questions follow the demographic information on the left hand side. The right hand side is composed of pictures, tables, and reference material numbered to correspond with the assessment items on the left hand side.

Use of the MPACAT

Target respondent. The MPACDAT has been designed primarily for completion by the caregiver in or outside of the primary care setting, and review by the APN in the primary care setting. It is likely that other health care personnel and teachers could administer this tool if properly educated regarding its administration, use, and follow up.

Target population. Preschool age children, ages 3-5, and their caregivers are the target population for application of the MPACDAT. These children can be identified in primary care through well child checks and immunization visits. The children can also be identified by supporting health care sites such as parent's and

caregiver's health care providers, or in acute care settings such as hospitals.

Schools and community based agencies such as family health clinics, home health care agencies and health fairs may also be able to interact with the target population.

Timing of administration. The MPACDAT is to be used during the preschool age years, and should be included as routine assessment data before or during the well child visit. The MPACDAT should also be used if nutritional deficits are discovered or suspected. Ideally, the APN should have a relationship with the client and caregiver; however, this is not necessary (Rankin & Stallings, 1996).

Setting. The MPACDAT can be used in the primary care office setting as well as in the school, community, home health care setting and in various acute care settings.

Process for use of the MPACDAT. Guidelines for use of the MPACDAT should be reviewed prior to utilization of the tool by personnel involved in the administration of the MPACDAT, and periodically reviewed by these same administering personnel as needed to ensure appropriate application. Caregivers will be completing the assessment questions prior to the office meeting with the APN. Caregivers unable to complete the assessment tool due to a reading level below the eighth grade or due to language or comprehension barriers may

complete the MPACDAT with a health care provider and/or translator in the primary care setting. Information gained through the items on the MPACDAT should be reviewed through interaction with both the preschool age client and the caregiver together at the visit, to ensure not only verification of material, but to contribute to increased understanding and relationship between the client, caregiver, and provider.

The items on the left hand side assessment section of the MPACDAT each provide a space for inclusion of specific or additional data which may facilitate discussion and intervention. Response format for each question are included at the end of each response space. The APN or caregiver may document the identified data and responses. Responses on the left hand side questionnaire will be compared with the corresponding numbered teaching material and information sections on the previous right hand side, with both the client and caregiver present. The left hand side qualitative data will then be added to the patient chart as subjective data, and the right hand side information sheet handed to the caregiver.

Items on the MPACDAT. The categories which divide questions on the MPACDAT are: overall requirement recognition and servings of fruits and vegetables, portion size, fruit and vegetable recognition, and meal and snack time

identification. There are six questions relating to serving size amounts of fruits and vegetables and requirements, one question relating to portion size, two questions relating to fruit and vegetable identification, and one question relating to meal and snack times. The right hand side reference sheet is referenced with each question's explanation as supporting data. The following paragraphs describe the items and reference materials and their inclusion in the MPACDAT.

Questions #1 and 3 assess baseline perception of the caregiver if the preschool age child is meeting his or her needs for fruit and vegetable requirements. These binary format questions set the stage for future teaching and provide insight into the caregiver's knowledge base. Categories that preschool age children typically lack in include fruits, vegetables, and breads (DHHS, 1999). Section #2 on the right hand side reference sheet shows the overall Food Pyramid for Kids (United States Department of Agriculture [USDA], 1999) and should serve as a pictorial introduction to the concept of fruit and vegetable serving sizes and requirements and their place and relationship with other food groups.

Item #2 assesses for usual meal times and snacks for the client. This is useful in determining for the APN food times and if opportunity for appropriate and adequate intake is available. Furthermore, failure by the caregiver to identify meals and meal schedules for the client may indicate a need for further in-depth

review and questioning. Section #1 of the right hand side reference sheet states the need for 3 meals and 3 snacks for the typical school age child (USDA, 1999).

Item #4 asks the caregiver's perception of a typical portion size for the preschool age child. Typically, the younger child needs less per serving in portion size to equal the recommended requirement; the USDA has recently reiterated this and set guidelines for 4 to 6 year olds, with 2 to 3 year olds needing 'less' (USDA, 1999). Caregivers may be overestimating or underestimating portion needs for the preschool age child, with this area subsequently needing attention. Section #4 of the right hand side reference sheet reviews these guidelines for all stages of the food pyramid. Models of portion size could be available in the practice setting.

Item #5 asks the caregiver the number of fruit servings per day using the last three days as a typical reference. Fruit intake is typically low for this population, and attention should be paid to ensure separation of fruits from vegetables to further specify adequate intake. Response format given is 0 to 5 and >5, with the USDA recommended requirement being 2 servings per day. More servings reported of fruits should be examined for validity as well as for possible intervention for an imbalance with other food groups and their requirements. Section #5 on the right hand side reference sheet reviews fruit servings pictorially and adds names of other fruits not seen in the table.

Item #6 focuses on including the preschool age child as well as the caregiver, and strives to ensure accurate reporting as well as education of the client. Section #5 of the reference sheet again shows fruit servings pictorially and adds names of other fruits not seen in the table. Discussion here should include identification of culturally and geographically sensitive fruits as needed for the client and caregiver.

Item #7 asks the caregiver to add the total number of servings of vegetables for a typical day, using the last three days as a point of reference for intake. The response format given is servings between 0 to 5. The recent USDA guidelines for kids states that for 2 to 6 year olds, there should be 3 servings of vegetables for a total of 5 serving of fruits and vegetables daily (USDA, 1999). Section # 7 of the right hand side reference sheet shows an enlargement of these key areas and their serving size requirements.

Item #8 also focuses on including the preschool age child as well as the caregiver, and strives to ensure accurate reporting as well as education of the client. Section #7 of the reference sheet again shows vegetable servings pictorially and adds names of other vegetables not seen in the table. Discussion here should include identification of specific differences in cultural and geographical fruits as needed for the client and caregiver.

Item #9 asks for caregiver reporting of fruit and vegetable juice intake in a typical day, using the last three days as a reference. This area is included separately from the other fruit and vegetable serving questions. This is to ensure proper identification of not only servings of fruits and vegetables in juices, but to educate the client and caregiver as to items which should not be included in calculation of fruit and vegetable intake, such as fruit flavored juices and drinks. The response format is 0 to 5 and >5, with the identified amount to be added to the appropriate serving section for fruits and vegetables. Section #9 of the right hand side reference sheet describes appropriate and non appropriate fruit and vegetable juices.

Item #10 asks the caregiver for identification of fruits and vegetables in combination foods. This should serve as another reminder and assessor for all fruits and vegetables eaten by the client. The response format is 0 to 5 and >5, with the scoring to be added to the appropriate serving section for fruits and vegetables. Section #10 of the right hand side reference sheet describes combination foods and their inclusion as servings of fruits or vegetables.

Scoring interpretation. There is an area below question #10 to total the number of individual fruit and vegetable servings as reported by the caregiver for the client, as collected in questions #5, 7, 9, and 10. This number can then be compared to the USDA guidelines of 5 servings of fruits and vegetables per day for the client as a

reference for reinforcement of positive patterns of intake, or for teaching and reference to appropriate fruit and vegetable servings for negative patterns of intake. A total serving score of less than 5 servings indicates a need for not only immediate teaching, but for clinical exam and follow up as needed at a subsequent visit within two to three days, as soon as the caregiver and preschool age client can accommodate return to the practice setting. Failure to participate in the follow up process by the family may necessitate a phone call by the office staff, a phone call by the APN, a home visit, and a referral to the local health department for information, instruction, and meeting with a dietician. Difficulty in fulfilling fruit and vegetable intake due to transportation, finances, or availability should likewise be followed up by contact from an assistive community agency.

A score of 5 servings or more should be communicated as adequate with attention continuing to focus on current guidelines and reinforcement of healthy eating. The clinician can make a brief note here as to the general summary of the data collected, both by circling the appropriate area and by brief narrative comment.

Time commitment for use of the MPACDAT. The time frame for administration and review of the MPACDAT should be approximately 15 to 20 minutes, with a suggested format of 10 minutes for documentation of the 10 question assessment if

done in the primary care setting, and 5 to 10 minutes used in review of information gathered and discussion of reference materials. However, these suggested times may vary based on client and caregiver education level, available time, and ability to interact and communicate effectively with the provider, as well as knowledge need regarding the material. Both the visual and oral review of both questions and material should aid in administration to hearing impaired or visually impaired clients and their caregivers.

Cost of the MPACDAT. The cost for obtaining and administration of the MPACAT can be limited to a one time fee paid to the author for a supply of original sheets, with copyright and reproduction fees waived for the provider for subsequent duplication in its original format and organization. The cost of time to the APN is covered under the office visit as teaching and preventative care, or during a well child visit.

Evaluation of the MPACDAT The MPACDAT can be evaluated for effectiveness of teaching and clinical improvement, maintenance, or worsening of dietary intake by repeat administration and analysis at subsequent visits. The reassessment can be included in documentation and reinforced through review and questioning. Data obtained in repeat administration of the MPACDAT can also be correlated with height and weight linear tables, and body mass index and laboratory value

comparisons. The APN practice setting can examine the time spent on the assessment and teaching tool correlated with subsequent nutrition related visits for either increased knowledge and questions asked, or worsening nutritional status of the client. The APN should evaluate effectiveness of time spent with the MPACDAT and the overall improvement in the client's and caregiver's familiarity of the topic. Collaboration with a registered dietitian and other community agencies such as food banks, etc., may also serve to reevaluate data and effectiveness. Overall validity of the information obtained should be examined to ensure valid dietary intake information, timeliness and clinical usefulness or applicability to clinical practice and outcomes. Reliability should be examined perhaps in a pilot study to include home visits or staff data collection to ensure reliable reporting and reliable data being used in analysis.

In summary, the MPACDAT is an assessment tool with a combined teaching and informational handout designed for use by the APN in the primary health care setting. Its design focuses on assessment and teaching as a unit, to reinforce concepts and to facilitate discussion. This assessment and teaching tool could also be used in various other settings as previously discussed. The information gathered should be used by the APN not only as assessment, but as an aid to mutual goal setting and intervention. Evaluation of the tool as a whole

should be an ongoing process, as material is updated and suggestions occur from the provider. The primary role of the APN in administration and use of the MPACDAT is in not only providing an introduction to the topic, but guidance and direction in exploration of the preschool age child's long term nutritional status through collaboration with the caregiver and other members of the healthcare team.

Implications

A discussion of the MPACDAT follows for implication of application of the assessment and teaching tool in the areas of obstacles to practice, theory application, clinical practice, education, and research.

Potential obstacles to implementation of the assessment and teaching tool:

structure. There may be obstacles in use of the MPACDAT when used in the primary care setting. One obstacle may be the needed increase in time of contact during a well child visit. Another obstacle that may arise is whether or not the APN has developed enough rapport with the client and caregiver to ensure accuracy in reporting. With this in consideration, the MPACDAT would not be applied until after three or four office visits. Another obstacle may be to the ability of the caregiver to participate in the assessment and reporting process. This could be alleviated by the clinician or healthcare provider orally reviewing and filling in

data on the MPACDAT. The participants could also take the MPACDAT home and bring it to a return visit, for additional caregiver input.

Potential obstacles to implementation of the assessment and teaching tool: process.

Another obstacle may be the limited interaction with the preschool age child due to age or level of cognition. This is a rationale for the caregiver as the primary data collector or informant. Another obstacle may be the APN's level of confidence with the material and the administration of the tool. This could be solved by the clinician attending a brief, 30 minute inservice at the clinical site by the author to review use, application, and troubleshooting. The author would also make one return 15 minute visit 2 months post initiation of the MPACDAT to review use, answer questions, and assess application of the tool. Another obstacle may be the reluctance of managed care and other insurance structures to reimburse for this teaching-based intervention. The APN should begin implementation armed with preliminary pilot results and benefits to communicate to these insurance structures as to overall client health and long term health and well being. The current font size may need to be increased to ensure legibility, and the tool itself should be tested by computer to examine reading level of 5th grade or below to aid with reliability in reporting.

Potential obstacles to implementation of the assessment and teaching tool:

outcome. The current tool may be culturally limited in that it may not address usual food and health status preferences or expectations for different ethnic groups and races. This may be solved by having geographically targeted tools, or different tools able to be selected by the caregiver or APN to include an established baseline. Input as to the community culture regarding food and food choices should be solicited and evaluated in development of the tool and subsequent suggestion of guidelines. As well, three days may ensure greater validity of information than the current two day recall. Two day recall may be limited for holism or accuracy of data collected.

Impact in advanced practice nursing. The impact to advanced practice nursing can be seen in the areas of not only increased communication and education with the client and caregiver, but in collaboration with other team members such as a dietitian or clinical colleague. Education and familiarity with the clinical content should be included for the baccalaureate nurse, the doctor and medical student, and for the dietitian and dietary student. Clinical skills will be enhanced through refreshment and reinforcement of specific nutritional needs of the preschool age client. Specifically, the APN roles of assessor, collaborator, educator, and clinician can be seen to expand from application of the assessment and teaching tool.

As an assessor, the APN would be collecting data, summarizing data,

formulating a diagnosis, and formulating interventions for the client and caregiver, with a focus on wellness and health maintenance. The APN would also be alert to assessment of potential problems or changes for the client or caregiver. As well, the APN will assess understanding and current knowledge base prior to therapeutic intervention.

As a collaborator, the APN will be able to promote collaboration between physicians, nurses, dieticians and other community agencies in providing immediate and current support, education and care for the preschool age client. The APN may also collaborate with other care facilities and providers to ensure continuity of care as the client utilizes the health care system.

The role of educator is strengthened by the application of the tool by focusing most time and energy into education not only of current needs and status, but also in future planning and long term wellness goals. Several educative techniques are used in the tool application including questioning, oral review, written assessment, visual reinforcement, and outcomes identification. The focus of the educative process is the client and the caregiver both separately and as a unit. The APN can and should tailor emphasis and delivery of the tool based on learning style, level of education, willingness to participate, and current level of specific knowledge.

The role of clinician will be enhanced with the MPACDAT through

heightened knowledge of nutritional needs and guidelines for counseling. The MPACDAT adds to the clinical knowledge of nutritional guidelines, and is current and specific to the preschool age client. The ability of the MPACDAT to be easily integrated into the clinical visit will serve to round out the well child assessment and to definitively include the area of nutrition into a qualitative assessment. As well, the MPACDAT will become a reliable and effective tool for assessment of clinical problems and states of wellness when used in conjunction with other clinical measures such as laboratory work, physical assessment, and linear height and weight tables.

Impact on education. There are numerous implications specific to the APN with respect to application of the MPACDAT. The APN, who is skilled in use of the MPACDAT could present the tool to peer, parents and the lay public, show application of the tool, discuss implications of findings, emphasize illness prevention and wellness promotion, and relate positive and negative findings to clinical outcomes in the client. The MPACDAT could be included not only in APN and other healthcare provider curriculum regarding education and nutrition, but in dietetic curriculum for the dietitian in practice as well. The MPACAT could be presented in poster form or oral and written form at conferences, seminars, or targeted discussion groups. The MPACDAT, although doubtful, could have

national application to APN practice and education with revised inclusion of and discussion of geographically and culturally sensitive parameters. Submission of the assessment and teaching tool for publication is another area for educational impact. By role modeling the application of and discussion of the tool in clinical practice, the APN could serve to educate the colleague or peer as well, both formally and informally.

Impact on primary care. The MPACDAT will be seen to have a direct and positive effect on primary care through several different methods. First, the MPACDAT can be seen to enhance nutritional assessment clinically for the preschool age child, as well as to serve as a first line interventional tool for problems or deficits discovered in nutritional needs for this population. The MPACDAT will also enhance communication and collaboration between providers not only at the point of service and time of service, but also throughout the plan of care and between future providers. The MPACDAT will also enhance the clinical relationship between provider, client, and caregiver through the application process of one-on-one assessment, questioning and discussion. Further use of the health care system for nutritional needs may become more streamlined as the caregiver not only becomes familiar with the content, but has reliable visual and cognitive resources through application of the MPACDAT, thus possibly preventing future repeat

visits or crisis intervention in primary care.

Impact on preschool age children. The MPACDAT will serve as a beneficial tool and resource for the preschool age child and caregiver through enhanced contact with the provider and increased and shared knowledge between the caregiver, client and provider. As well, the target population would see overall increased states of health and well being due to closer monitoring of nutritional needs and levels of wellness and growth and development for the preschool age child.

Impact on research and evaluation in nursing. The MPACDAT is an untested tool and therefore is subject to reevaluation of organization and content of items. As well, the currentness of information provided in the teaching section of the tool would need to periodically addressed. An initial approach for testing is to have clinicians experienced in the field of nutrition and/or preschool age children and assessment review the tool for content validity and clarity. The tool would then be piloted in three or more clinical settings for 3 months to examine reliability of information gathered as correlated with clinical status, as well as validity of answers reported. Scores and data would be compiled and then the tool would be reapplied for 6 months with any corrections, clarifications, or revisions presented and reviewed in inservice format for the clinical setting. A brief qualitative survey could then be taken of clinicians and select clients as to clarity, increase in content

knowledge and increase in familiarity. As well, these peer evaluators could assess ease of use and appearance of the tool. The MPACDAT could be further evaluated for validity and reliability by testing the information and results with an enlarged and diverse group of clients and caregivers in an expanded group of practice settings. This would evaluate comprehension of teaching materials and clinical correlation in positive and negative findings on an enlarged scale.

The APN as researcher could further develop future questions and teaching material for expansion or further focus of the MPACDAT. The MPACDAT could further be developed by the APN to include specific interventions and guidelines for the APN and peers in the primary care setting.

The development of this project and assessment and teaching tool also illustrates the need for expanded research in the area of nutrition and the preschool age client, as well as in the preschool age child in general. Nutritional research could also be expanded to include examination of all food groups and key clinical indicators for each, as well as in intervention and follow up for the preschool age client and caregiver, each separately and as a unit.

Conclusion

The APN plays a key role in assessment and education of nutritional needs for the preschool age client and caregiver. Current literature highlights a need for

focus on the area of highest deficit for the young child, namely fruits and vegetables (Johnson-Down et al., 1997). The research also shows a lack of attention to the overall nutritional needs of the preschool age child, and a deficit in nutritional assessment for the young child. While some research has been recently retooled for educational use for the preschool age child (USDA 1999), overall guidelines for teaching in primary care are lacking. Research regarding the APN and nutritional assessment in the preschool age child is greatly needed. The MPACDAT incorporates current nutritional guidelines and key assessment items into an assessment and teaching tool which emphasizes the relationship between assessment, early recognition, education, and wellness promotion for the preschool age child and caregiver. Its intended use in primary care is for a realistic, easily used set of guidelines for early intervention in the nutritional needs of the young child. The MPACDAT gives the APN a chance to reinforce and expand the role of the APN in several areas while providing a research base for future evaluation, expansion and focus. The APN in current practice is in an excellent position to quickly and dramatically affect the health and well being of the preschool age child, thus directly affecting overall health and positive outcomes in the nurse-client relationship.

APPENDICES

Appendix A

The Miller Preschool Age Child Dietary Assessment Tool (MPACDAT)

Name of client _____ Age at time of review _____

Name of caregiver _____ Relationship _____

Date _____ Reviewer _____

Please answer each question to the best of your ability.

Fill in your information on this side. Circle the best answer to each question.	For Clinician Use:
1. My preschooler is meeting his/her needs for daily fruit and vegetable requirements. Yes No	Yes No
2. My preschooler usually eats meals and snacks at the following times: 12 MN 1 2 3 4 5 6 7 8 9 10 11 12 noon 1 2 3 4 5 6 7 8 9 10 11pm	
3. My preschooler eats 0-1-2-3-4-5->5 servings of fruits and vegetables per day.	
4. On average, how much is a portion size of fruits and vegetables for my preschooler? quarter size one half cup one cup	
5. My preschooler has eaten 0-1-2-3-4-5->5 total fruit servings (on average) for each of the last three days:	0-1-2-3-4-5->5
6. My preschooler can name the following fruits:	
7. My preschooler has eaten 0-1-2-3-4-5->5 total vegetable servings (on average) for each of the last three days;	0-1-2-3-4-5->5
8. My preschooler can name the following vegetables:	
9. My preschooler has drank 0-1-2-3-4-5->5 fruit or vegetable juice servings has on average for each of the last three days:	0-1-2-3-4-5->5
10. My preschooler has eaten 0-1-2-3-4-5->5 servings of fruit and/or vegetable combination foods on average for each of the last three days;	0-1-2-3-4-5->5

Total fruit and vegetable servings for items 5,7,9,10 _____

Summary: below needs meeting needs above needs

Findings and clinical impression: _____

Summary of teaching: _____

The Miller Preschool Age Child Dietary Teaching Tool

1.

Preschoolers should be eating 3 meals and three snacks per day. (USDA, 1999). A sample schedule might appear as below:

Breakfast	Snack	Lunch	Snack	Dinner	Snack
8:00am	10:00am	12:00 pm	3:00 pm	6:00 pm	9:00 pm

2. Source: USDA 1999



4. What counts as one serving?

Fruits: 1 piece of fruit or melon wedge
3/4 cup of juice
1/2 cup of canned fruit
1/4 cup of dried fruit

Vegetables: 1/2 cup of chopped raw or cooked vegetables
1 cup of raw leafy vegetables
3/4 cup of vegetable juice



Other fruits include melon, grapes, kiwi, grapefruit, strawberries, blueberries, mango, watermelon, apricots, raspberries, lemons limes, and star fruit.



Other vegetables include broccoli, cauliflower, green pepper, corn, peas, green beans, potatoes, spinach, onions, squash, lima beans, lettuce, turnips, rutabagas, and snap peas.

9.

Fruit and vegetable juice servings can include orange juice, V8 juice, pineapple juice or apple juice. Fruit and vegetable juices should include the words "100% juice" to count as a serving. Fruit drinks such as Kool Aid or Hi C do not count as a serving of fruits or vegetables.

10.

Combination foods can include items with fruits and vegetables in them, such as fruit cocktail, vegetable lasagna, fruit salad, pizza, green bean casserole, jello fruit salad, spaghetti sauce with vegetables, tacos with vegetables, stew with vegetables., and chili with beans.

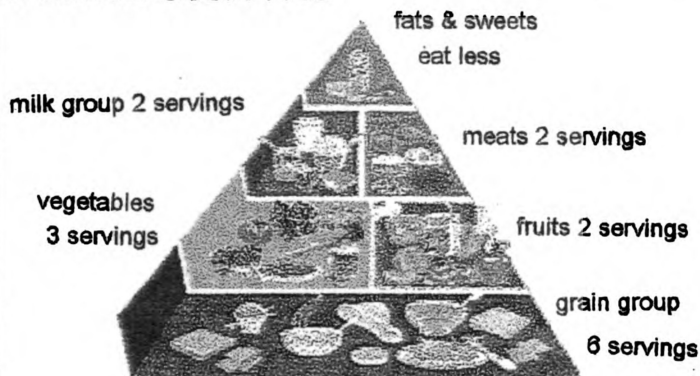
The Miller Preschool Age (

1.

Preschoolers should be eating 3 meals and t
schedule might appear as below:

Breakfast	Snack	Lunch
8:00am	10:00am	12:00 pm

2. Source: USDA 1999



**Food Guide Pyramid
for Young Children**

5.



Other fruits include melon, grapes, kiwi, grapefruit, strawberries, blueberries, mango, watermelon, apricots, raspberries, lemons limes, and star fruit.

9.

Fruit and vegetable juice servings can include orange juice, V8 juice, pineapple juice or apple juice. Fruit and vegetable juices should include the words "100% juice" to count as a serving. Fruit drinks such as Kool Aid or Hi C do not count as a serving of fruits or vegetables.

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