DETERMINING WHAT CONSTITUTES NUTRITIONAL RISK IN TODDLERS (18-35 MONTHS): FIRST STEPS IN THE DEVELOPMENT OF TODDLER NUTRISTEP (REGISTERED TRADEMARK)

A Thesis
Presented to
The Faculty of Graduate Studies
of
The University of Guelph
by
JILLIAN GUMBLEY

In partial fulfilment of requirements
for the degree of
Master of Science
August, 2011

© Jillian Gumbley, August, 2011
ABSTRACT

DETERMINING WHAT CONSTITUTES NUTRITIONAL RISK IN TODDLERS (18-35 MONTHS): FIRST STEPS IN THE DEVELOPMENT OF TODDLER NUTRISTEP®

Jillian Gumbley
University of Guelph, 2011

Advisor: Dr. Janis Randall Simpson

This research is part of an ongoing program, Nutrition Screening Tool for Every Preschooler (NutriSTEP®). NutriSTEP® is a valid and reliable 17-item, parent-administered, questionnaire for nutritional risk in preschoolers (3-5 years of age). Due to an expressed need across Canada, the specific objective of this research was to create a draft toddler (18-35 month) NutriSTEP®. Based on results from a comprehensive literature review, focus groups (n=6) with 48 parents of toddlers, and input from 13 pediatric nutrition experts, many questions from the original preschooler NutriSTEP® questionnaire were refined or removed, and novel questions were added. Basic changes included combining separate fruit and vegetable intake questions, and adding breast milk and formula as examples of dairy products. In conclusion, a 19 item Toddler NutriSTEP® was created to reflect the differences in nutritional risk between preschoolers and toddlers. Next steps in the development process include refinement, test-retest reliability and criterion validation.
Acknowledgements

Completing my Master’s thesis was an extremely rewarding and valuable learning experience, yet it proved to be quite challenging at times, and I could not have done it without the extensive support I received from my advisor, fellow researchers, friends, and family.

I would initially like to recognize my advisor, Dr. Janis Randall Simpson, for her overwhelming support and guidance, above and beyond that which is required of an academic advisor. I believe that my overall graduate student experience was enhanced greatly due to your caring and passionate nature, and for that I am truly grateful. Thank you for this amazing experience.

I would also like to thank my committee member, Dr. Heather Keller, as well as NutriSTEP® researchers: Lee Rysdale, Joanne Beyers, Mary Turfryer and Elizabeth Shaver-Heeney, for their guidance, and dedication to the NutriSTEP® project, as it provided me with a once in a lifetime opportunity.

I would also like to acknowledge my fellow graduate students: Kwan Yu Li, Emily Opperman, Amy O’Connor, Caitlin Way, Laura French, Kylie Whyte and Mary Anne Smith, for their overwhelming support throughout my graduate studies. It was their work ethic, dedication, and friendliness that often formed my inspiration for success. I would also like to thank my friends Becky Forster, Tina Perkins, Ashley Johns, and Cortney Simkins, who were always available to support me throughout the stressful times, and for this I am very appreciative.

Lastly, Mom, Dad, Chelsea, Nanny, and Granddad, thank you for being so understanding and supportive throughout my entire University career.

I would also like to acknowledge CIHR for providing the funding for this research.
Table of Contents

Acknowledgements........................................................................................................................................ iii
List of Tables .................................................................................................................................................. vi

1.0. Introduction ........................................................................................................................................... 1

2.0. Literature Review ................................................................................................................................. 2
  2.1 Introduction ........................................................................................................................................ 2
  2.2 Measurement ..................................................................................................................................... 2
  2.3 Health Measures ................................................................................................................................. 3
  2.4 Development of Health Measures ..................................................................................................... 3
  2.5 Nutrition Screening Measures ......................................................................................................... 6
    2.5.1 Nutrition Risk ............................................................................................................................... 6
    2.5.2 Development of Nutrition Screening Questionnaires ............................................................... 7
    2.5.3 Purpose and Benefits of Nutrition Screening ............................................................................. 8
  2.6. NutriSTEP® Background ................................................................................................................ 9
  2.7 Summary ........................................................................................................................................... 10

3.0. Research Objective ............................................................................................................................... 12

4.0. Study Design and Methods .................................................................................................................. 13
  4.1. Introduction ..................................................................................................................................... 13
  4.2. Phase 1: Literature Review .............................................................................................................. 13
  4.3. Phase 2: Parental Focus Groups ..................................................................................................... 14
    4.3.1 Participants .................................................................................................................................. 15
    4.3.2 Interview Guide ........................................................................................................................... 17
    4.3.3 Procedures .................................................................................................................................. 18
    4.3.4 Analysis ..................................................................................................................................... 20
  4.4. Phase 3: Pediatric Nutrition Expert Opinion .................................................................................. 21
    4.4.1 Survey ....................................................................................................................................... 21
    4.4.2 Teleconference Discussion ......................................................................................................... 25
  4.5. Summary and Next Steps ................................................................................................................ 27

5.0 Results .................................................................................................................................................... 28
  5.1 Phase 1: Identification of Nutrition Risk Constructs and Item Themes for Toddler NutriSTEP® .......................................................................................................................... 28
  5.2 Phase 2: Parental Focus Groups ....................................................................................................... 30
  5.3 Phase 3: Pediatric Nutrition Expert Opinion .................................................................................. 33
  5.4 Summary ........................................................................................................................................... 39

6.0 Discussion ................................................................................................................................................ 40
  6.1 Food and Fluid Intake ........................................................................................................................ 40
    6.1.1 Food Group Intake ....................................................................................................................... 40
    6.1.2 Juice and Sweetened Beverage Consumption ........................................................................... 43
    6.1.3 Fast, Processed, and Convenience Food Consumption .......................................................... 44
    6.1.4. Fluid Consumption and Mealtime Hunger ............................................................................. 45
    6.1.5. Meal and Snack Patterns ......................................................................................................... 46
    6.1.6 Supplement Use .......................................................................................................................... 47
  6.2 Factors Affecting Food Intake ........................................................................................................... 47
6.2.1 Food Security ................................................................. 48
6.2.2 The Feeding Environment .............................................. 48
6.2.3 The Feeding Relationship .............................................. 49
6.2.4 Other Factors to Consider ........................................... 52
6.3 Physical Activity and Sedentary Behaviour ....................... 52
6.4 Growth and Development .............................................. 54
   6.4.1 Growth and Weight Status ....................................... 54
   6.4.2 Developmental and Physical Capabilities ...................... 55
6.5 Comparison to Other Pediatric Screening Tools ................... 58
6.6 Summary ........................................................................ 60
6.7 Strengths of the Research ..... ............................ 60
6.8 Limitations .................................................................. 62
6.9 Next Steps ..................................................................... 64

7.0 Conclusions ..................................................................... 65

8.0 References ........................................................................ 66

9.0 Appendices ........................................................................ 75
   Appendix A. Preschooler NutriSTEP* ....................................... 75
   Appendix B. University of Guelph Ethics Application ............... 80
   Appendix C. Focus Group Interview Guide ............................ 93
   Appendix D. Focus Group Participant Package Contents .......... 97
   Appendix E. Survey Monkey Questionnaire .......................... 103
   Appendix F. Invitation to Pediatric Dietitians to Participate in Study 114
   Appendix G. Teleconference Discussion Guide ....................... 118
   Appendix H. Summary of Focus Group Findings .................... 124
   Appendix I. Toddler NutriSTEP Item Stems (Draft 1a) ............ 129
   Appendix J. Toddler NutriSTEP Item Stems (Draft 1b) ............ 131
   Appendix K. Toddler NutriSTEP Item Stems Final Draft ......... 133
List of Tables

Table 5.1: Preschooler NutriSTEP nutrition risk concepts and themes: Summary of literature regarding risk in toddlers

Table 5.2: Parental focus group participant demographic information

Table 5.3: Pediatric nutrition expert review participant demographic information

Table 5.4: Summary of online survey responses from pediatric nutrition expert review of draft Toddler NutriSTEP questions
1.0. Introduction

The purpose of this study was to identify the item question stems necessary for the development of a draft nutrition screening questionnaire for toddlers (18-35 months of age). This project is part of the ongoing NutriSTEP® (Nutrition Screening Tool for Every Preschooler) program. NutriSTEP® is a valid and reliable nutrition screening tool for preschoolers (3-5 years of age). Since the development of NutriSTEP®, there has been an expressed need from professionals across Canada for the development of a screening tool for the younger, toddler population. Screening tools, which collect data on relevant risk factors and determine needs for further nutritional assessment (ADA, 1994), must be carefully developed for a specific population group as there will be risk factors specific to that group (Keller, 2006). In an attempt to standardize the process of questionnaire development, Jones (2004) has recommended a multi-phase process: a) identification of risk variables; b) content validity with an expert group to assess completeness and relevance; c) designing the questionnaire, including question wording and lay out; d) pilot testing of the draft questionnaire; e) univariate and multivariate analysis to determine the effect of each individual risk indicator upon nutritional status, as well as the simultaneous effect of all nutrition risk indicators upon nutritional status; f) further pilot testing of updated, reduced, questionnaire; g) identification of cut-off values for classification as at-risk or not at-risk; h) reliability testing; and, i) validity testing. This study describes the initial steps in the development of a toddler nutrition screening questionnaire (NutriSTEP®), including the identification of risk variables, assessment of content validity, and some initial aspects of the questionnaire design.
2.0. Literature Review

2.1 Introduction

The following literature review will provide a brief overview of measurement, and more specifically, the development of health measures, as well as the concept of nutrition risk and nutrition screening. It will also include a brief description of the NutriSTEP® project.

2.2 Measurement

Measurement has been defined as the “process of assigning numbers or labels to units of analysis in order to represent conceptual properties” (Singleton & Straits, 2010, pg 115). In order to appropriately measure concepts, these must first be conceptualized, to provide clarification and identify meaning. Concepts can represent single, or multiple varying categories, which are often referred to as variables. Following conceptualization, the categories, or variables which have been identified to represent a concept, must be operationally defined. Indicators, or “single observable measures” (Singleton et. al, 2010, pg 118), are often identified in this process. Multiple indicators are usually used to operationally define a concept, as indicators are each subject to error and often cannot capture a complete concept individually (Singleton, 2010). It is very important when conducting any form of measurement, specifically measurement of health status, which often cannot be directly observed, that researchers explain this process of conceptualization and identification of indicators (Singleton, 2010 & Shi, 2008). Following definition and conceptualization of concepts and indicators, there are multiple forms of conducting measurements including: participant self-report measures, observations and/or analysis of secondary data (Singleton, 2010).
2.3 Health Measures

Health is a complex concept and cannot be measured directly, or objectively. There are multiple indicators that affect health status; therefore, in order to measure health, or health-related concepts, composite measures are necessary (Keszei, Novak, & Streiner, 2010). Keszei et al. (2010) explain that health measures can be classified based on: function, or how they are used; description, or the concepts/topics they cover; and methodology. These measures may be generic, or concerned with a specific disease and/or population. Furthermore, they may take various forms including: rating scales, questionnaires and indices, and might collect data objectively and/or subjectively (Keszei, 2010). The differentiation between health rating scales and questionnaires is related to the flexibility of the measure (McDowell, 1996). Rating scales involve expert judgment to assess health, and often the questions and process will be unique to each patient. Questionnaires, in comparison, involve a structured set of questions and standardization among all respondents. The latter assumes that indicators being measured are applicable to all. The method of summarizing data collected also provides further classification of a health measure as an index or profile. Health indices involve scores from multiple indicators combined to provide a total score, whereas, a health profile involves summation of scores from each aspect separately (McDowell, 1996). Numerical scaling can be applied to health indices, which would involve rating the severity of multiple elements of each indicator, as well as determining the individual importance of each indicator towards the overall concept. This would then provide a combined rating to describe an individual’s overall health status (McDowell, 1996).

2.4 Development of Health Measures

Wright and Feinstein (1992) describe multiple decisions that must be made prior to initiating the development or evaluation of a health measure. First, it must be determined if the measure intends to: detect attributes of people or other stimuli; measure a single, or several
attributes; use single or multiple items to measure the attribute(s); combine all items for a single score or combine certain items for cluster scores; and, lastly, indicate current or a single state, or a change in state (Wright, 1992). These decisions will ultimately help the researcher decide upon the appropriate measurement tool.

Following these decisions, the first step in the development of a measure of health or health related concepts, should be the determination of the concepts or indicators, which “successfully reflect an explicit and accepted definition of health” (McDowell, 2006). There are three common primary methodological approaches when selecting items for inclusion on a health measure: psychometric, clinimetric, and criterion methods (Wright, 1992).

Psychometric methodology is most suitable when attempting to measure a construct, or a “mini-theory to explain the relationships among various behaviors or attitudes (Streiner, 2008),” that has a single attribute, which is an “inherent characteristic of an object or person” (Wright, 1992). These measures often contain multiple items correlated with the single attribute, and development often follows rigorous methodology. In contrast, clinimetric measures are used for constructs with multiple attributes (Wright, 1992). Methods followed in the development of a clinimetric measure are often described as “ad hoc,” as variables are chosen through “dissected intuition” which refers to identification of logical and evidence-based variables based on clinical observations (Wright, 1992). Lastly, measures developed based on criterion methodology contain variables that are chosen based upon correlation with a criterion, which is ideally the “gold standard” or best available indicator of a specific phenomenon; however, more commonly, it is a separate outcome that can be identified by the measured criterion (Wright, 1992). The criterion method is sometimes applied after the other methods have been used, which may be useful when trying to limit items (Keller, 2000).

Many authors and researchers have outlined best practices for the determination of appropriate items to be used in health-measurement scales or questionnaires (Shi, 2008;
Examining similar questionnaires or scales is commonly recommended as the initial step, as many items can often be repeated which saves developmental time; moreover this is also beneficial as questions have likely been identified as valid and reliable by others (Keszei et al., 2010, Shi, 2008; Streiner & Norman, 2008; Jones, 2004; & Wright, 1992). Despite limitations of existing measures, development of an entirely new scale or questionnaire may not be necessary, but it may be desirable depending on the situation (Jones, 2004). Often existing scales/questionnaires, even those with limitations, can be modified and improved. However, assessing the methodology of the original design, as well as testing the modified version prior to use, are both important should an existing measure be used. In certain situations, related existing tools may lack published information regarding original design, or contain extensive methodological limitations, and there may be justification for development of an entirely new tool (Jones, 2004). When an appropriate existing tool is available, new questions will likely be necessary to adapt and modify the questionnaire specific to the construct in context of the new health measurement scale. New questions can be developed using strategies such as: gathering data and perceptions from potential questionnaire users, from clinical observation, theory, research and expert opinion (Streiner, 2008).

It has been documented that obtaining perceptions of potential questionnaire users (e.g., target population, patients, etc.), in addition to professionals, is an excellent source in the item determination process, as these potential users have the ability to identify the “subjective elements,” that professionals and clinicians may not identify (Streiner & Norman, 2008 & Keszei, 2010). Focus groups and/or key informant interviews are proposed as methods for obtaining these data (Streiner & Norman, 2008 & Keszei et al., 2010). Focus groups should be used to identify general themes, which can be further refined by the research team. Key informant interviews, which are more in-depth interviews with a smaller
sample size, interview those who are knowledgeable about the disease/disorder of interest (Streiner & Norman, 2008). It is recommended that these interviews be conducted until there are no new emerging themes (Streiner & Norman, 2008). Research and expert opinion are also important sources for item determination (Keszei et al., 2010, Shi, 2008; Streiner & Norman, 2008; Jones, 2004; & Wright, 1992). Research can include previously-conducted literature reviews, or research conducted specifically for the purpose of developing the questionnaire. Expert opinion involves questioning experts in a specific field regarding opinions of the most important characteristics or risk factors of the chosen condition. Methods of collecting these opinions vary greatly; however, experts should be chosen carefully to represent current and relevant thinking in the area of interest (Streiner & Norman, 2008). Furthermore, a panel of experts should be included in this process to avoid biases of a single expert (Keszei et al., 2010).

2.5 Nutrition Screening Measures

Nutrition risk is a concept that can be measured, similarly to health status, with the use of a measurement tool. Tools developed to measure nutrition risk usually take the form of a structured questionnaire, with questions measuring specific indicators, or risk factors (Jones, 2002). Responses to these individual questions are combined to determine an individual’s risk of malnutrition, therefore creating a nutrition screening index (or scale if numerical scaling is applied to responses as described above).

2.5.1 Nutrition Risk

As described previously, the initial phase in the development of any health measure is to conceptualize, and operationally define the concept to be measured. Therefore, prior to the development of a nutrition screening questionnaire, it is important to clarify and identify the concept of nutrition risk, as well as the purpose for measuring nutrition risk, which is nutrition screening.
The American Dietetic Association (ADA) defines nutritional risk as the presence of characteristics or risk factors that can lead to impaired nutritional status (ADA, 1994). However, nutrition risk is a complex and ambiguous concept, and thus, detailed descriptions of the antecedents, or the factors that occur before the concept of interest, must be identified through extensive methodology (Chen, Schilling, & Lyder, 2001). Chen et al. (2001) devoted an entire study to the clarification and definition of the concept of malnutrition. Keller (2007) describes malnutrition, including both under and overnutrition (e.g. obesity), as a continuum. The continuum includes four phases: presence of risk factors, impaired food intake, subclinical malnutrition, and overt malnutrition. Subclinical malnutrition symptoms, such as minor changes in body weight or composition, may not initially present as serious issues, however, if not identified and treated, progression to overt malnutrition, or clinically significant symptoms, may occur.

2.5.2 Development of Nutrition Screening Questionnaires

Development of nutrition screening questionnaires should follow methodology similar to development of other health related measures. These indices must be relevant to a specific population group based upon the predetermined risk factors and concept of nutritional risk specific to that group (Keller, Hedley, & Wong Brownlee, 2000). In addition to identification of a specific target group, these measures must also be appropriate for the situation or setting in which it is to be used (Edington, 1999; Keller et al., 2000). Keller et al. (2000) recommends using a combination psychometric, clinimetric, and criterion methods as the best approach when developing a nutrition screening questionnaire. Jones (2004) outlines the specific steps to be followed in the development of nutrition screening measures as follows: 1) review of existing tools to identify whether a new tool is needed, or if adaptations to an existing tool would be sufficient; 2) identification of risk variables through literature review, existing questionnaires, and/or expert/clinical input; 3) determining content validity of
selected risk variables, which involves assessing expert opinion of each variables relevance to the concept of malnutrition, as well as whether any variables are missing; 4) developing questionnaire design and layout, which involves writing questions, selecting question sequence and writing instructions for ease of completion; 5) pilot testing initial draft following study protocol identifying any necessary revisions; 6) analysis of pilot study results both univariately, to identify impact of each individual risk factor upon nutritional status, as well as multivariately, examining impact of all variables together to ensure the minimum number of questions for accurate classification are selected; 7) pilot testing of refined draft to determine risk cut-off values for proper classification, with ideal sensitivity and specificity levels; and 8) reliability and validity testing.

2.5.3 Purpose and Benefits of Nutrition Screening

The purpose of nutrition screening is to identify those who are asymptomatic, but at nutritional risk, and to refer these individuals for further, more complex, assessment and treatment (ADA, 1994; Keller, Broest & Haresign 2007; Keller, 2007). This attempt to detect subclinical risk factors and/or symptoms to prevent or reverse malnutrition, is very important, due to the previously discussed progression from subclinical malnutrition to overt malnutrition when initial symptoms or risk factors are not identified (Keller, 2007). The screening process is much more complex than solely developing a screening questionnaire for a well-defined, observable disease or condition (Keller et al., 2006). Following development, to function as a method of early detection, the process of implementation must be determined. When considering implementation, the issue of ethical screening arises. This is due to the altered relationship between health care professionals and clients where the professional seeks out the client and attempts to identify those who require further assessment and treatment; hence, this is different from the typical doctor-client relationship (Keller et al., 2007). As a result of this reversal in roles, the health care provider
needs to accept responsibilities outside of those associated with a typical data collection (Rush, 1997). Ethical screening is the notion that individuals in need of resources or education must be targeted through consistent administration of a valid and reliable screening tool. Further, those individuals identified to be at risk must then be provided with options for assessment and treatment through the use of resources, services and/or education. Lastly, follow-up should be completed with the individuals to ensure that their nutritional needs have been met with the intervention (Keller et al., 2007).

Nutrition screening has become an emerging concept of relevance to practitioners and researchers and this will likely increase as society continues to experience a growing need for nutrition services and chronic disease prevention (Keller et al., 2007). The ADA describes the identification of patients who are at nutritional risk and attempting to improve their nutrition status as one of the major activities necessary for providing cost-effective medical nutrition therapy (ADA, 1994). With proper planning and development, nutritional screening has the potential to significantly improve nutritional status.

2.6. NutriSTEP® Background

This project is part of an ongoing program, Nutrition Screening Tool for Every Preschooler (NutriSTEP®). NutriSTEP® is a valid and reliable nutrition-screening questionnaire for preschool aged children (3-5 years of age) (see NutriSTEP® questionnaire in appendix A). The specific population of preschoolers is those living in the community, with no apparent disease; thus NutriSTEP® is not specifically designed for clinical use in specialized services. Development of this questionnaire followed an extensive, multi-phase process (Randall Simpson, Keller, Rysdale & Beyers, 2007). To develop items to address the concept of risk for this group in the community context, first, research literature was used to identify predictors of poor nutritional status in young children. Then input from the target group and experts was attained to determine their perspectives on what nutrition risk was for this age
Parents of preschoolers, and national, provincial and local nutrition professionals participated in various ways, including focus groups, health fairs, key intercept interviews, and individual consultation. Furthermore, this detailed and extensive process resulted in the following four nutrition risk constructs being identified for inclusion in the preschooler questionnaire: food and fluid intake, factors affecting food intake, physical growth, and physical activity and sedentary behavior (Randall Simpson et al., 2007). Following construct identification, and development of a draft questionnaire, refinement, reliability testing, and validity testing were implemented (Randall Simpson et al., 2007). Criterion validation, involving the comparison of NutriSTEP® results with a registered dietitian’s risk rating based on a full nutritional assessment (clinical, anthropometrical & dietary measures reported), was conducted. These results were compared with the use of receiver operating characteristic (ROC) curves, and are described in detail elsewhere (Randall Simpson et al., 2007). This validation was necessary to identify risk cut-off points for index scores, as well as sensitivity and specificity of the measure. NutriSTEP® reliability was identified through administering the questionnaire to the same individuals on two separate occasions, at least 2 weeks apart, which is often known as test-retest reliability (Randall Simpson et al., 2007).

The end result of this extensive and lengthy developmental process was the development of a valid and reliable, 17-item, parent administered, community-based nutrition risk screening tool.

2.7 Summary

Since the development of this preschooler NutriSTEP®, there has been an expressed need across Canada for the development of a similar screening tool for use with toddlers (18-35 months of age). Watson-Jarvis et al. (2011) documented the need for a nutrition screening tool for toddlers. As noted, screening tools must be population-specific; therefore,
adaptations to the current questionnaire are required in order to make it suitable for toddlers. In order to make the appropriate adaptations to the questionnaire, nutrition risk constructs and questions relevant to toddlers must be identified. While the previously mentioned nutrition risk constructs identified for preschoolers will likely be similar for toddlers, there are also unique nutritional issues and risk factors for younger children.
3.0. Research Objective

The objective of the proposed research is to identify constructs and item content to be included in a nutrition risk screening questionnaire for toddlers aged 18-35 months (NutriSTEP®) using data from the following sources:

1. Scientific literature
2. Parental input
3. Pediatric nutrition expert input

Subsequent developmental steps to refine item stems through key intercept interviews with parents and reliability and validity testing of these questions, was outside the scope of this thesis work.
4.0. Study Design and Methods

4.1. Introduction

This study was a multi-phase, iterative process involving parents/caregivers of toddlers, pediatric nutrition experts and members of an experienced research team. Phase one consisted of an extensive literature review examining nutritional issues and risk factors specific to the toddler population. This was followed by focus groups with parents/caregivers of toddlers, which were qualitatively analyzed to identify key concepts of nutrition risk from the parent perspective. Pediatric expert opinions were surveyed on item themes resulting from the first two phases and results reviewed by the group in a follow up teleconference discussion. Consultation with the NutriSTEP® research team, which consists of registered dietitians, researchers and public health professionals, took place throughout the entire process.

4.2. Phase 1: Literature Review

In an attempt to expand current knowledge of toddler nutritional risk constructs, a literature review was conducted. Measurement experts identify this as a crucial first step, to not only ensure that no other tool similar to the one of interest has already been developed, but to help identify what is of concern and define the construct under investigation (Keller et al. 2000; Chen et al., 2001; Keszei et al., 2010; Jones, 2004). Furthermore, Flick (2006) explains that reviewing the literature on a topic area is a necessary step in qualitative research, allowing researchers to gather insights and background information to develop “context knowledge.” He further explains that this will assist in determining what may already be known about the topic of interest (Flick, 2006).

This phase had three objectives: 1) determine if there are any existing tools measuring the same, or similar, constructs; 2) expand current knowledge of toddler nutritional risk factors;
and, 3) develop an interview guide, informed by the literature, and research team consultation, to be used in future focus group sessions to gather parental/caregiver perceptions of nutrition risk. The literature review covered the nutrition risk constructs identified in the earlier preschooler NutriSTEP® project (food and fluid intake, factors affecting food intake, physical activity and sedentary behaviour, and physical growth) and assessed their relevance in toddlers, and also any toddler-specific nutrition risk factors and subsequent constructs that needed to be assessed. Following completion of the review, a focus group interview guide was developed for phase two of the research project.

Pubmed (Medline) was the main database used to retrieve articles for the review, although Google scholar search engine was also used frequently. In addition, reference lists of articles chosen for inclusion were hand searched for suitable articles. Common terminology was used for the various searches, including the terms: toddler; or infant; and nutrition; or nutrition issues; or nutrition risk; or nutrition status. Also, searches conducted to identify whether the previously-identified preschooler nutrition risk factors were also pertinent to toddlers, involved additional terms specific to the risk factor, such as “physical activity,” or “feeding relationship.”

4.3. Phase 2: Parental Focus Groups

The second phase of this study was qualitative, as this allowed researchers to study knowledge and practices of participants, gathering data on their perspectives and acknowledging their diversity (Flick, 2006). Focus group discussions were used to gather parental perceptions regarding the appropriateness of the preschooler NutriSTEP® questions for toddlers, as well as nutritional issues and concerns specific to this age group. Focus groups were chosen as the form of qualitative methodology as they have been defined as a “carefully planned series’ of discussions designed to obtain perceptions on a defined area of interest in a permissive, nonthreatening environment” (Krueger, 2000). Furthermore, they are
recommended when research is being conducted in an attempt to gather a range of ideas and/or feelings, as well as when pilot testing new ideas (Krueger, 2000). The intent of these focus groups was to “promote self-disclosure among participants” by providing them with a comfortable, permissive and non-judgmental environment. Focus groups mimic a very natural environment due to the dynamic and influential environment, and because of this, allowed exploration and clarification of parental views in ways that would not have been possible through individual interviews (Krueger, 2000). For example, the natural influences individuals have upon each other in groups, very similar to real-life situations, would not be attainable through one-on-one interviewing. Thus focus groups were chosen as the most appropriate methodology for this phase.

4.3.1 Participants
Parents/caregivers of toddler-aged children were chosen as the target audience based on their ability to provide insight regarding toddler’s nutritional issues. Furthermore, as with NutriSTEP®, Toddler NutriSTEP® was going to be a self-administered, parent-level questionnaire and thus their opinions on the construct of risk and types of items that would be appropriate for inclusion needed to be assessed (Streiner, 2008).

Prior to participant recruitment, Ontario Early Years Centers (OEYC) were selected by collaborators to host the focus group sessions. OEYCs are community organizations where parents and their children can partake in various programs and activities run by early years coordinators. These sites were useful for many reasons, including: availability of many parents at the site; childcare availability; private rooms available on site for focus groups; and, coordinators to assist with organization and planning.

Inclusion criteria for these centers were: a) ability to recruit approximately 12 parents for a 1.5 hour focus group session; b) ability to conduct telephone reminders a few days prior to sessions; c) ability to provide a location to hold the parent discussion groups; and d) on-site
child care availability for the duration of the focus group. Of these sites meeting this criteria, final decisions were made both purposively, to ensure sites were geographically and ethnically diverse, as well as conveniently, preferring centers that had previously participated in NutriSTEP® projects as these employees were familiar with the program.

Following site recruitment, participant recruitment took place, which was conducted by the site coordinators. Participant inclusion criteria, outlined by the research team and provided to the site coordinators, were as follows: a) must be parent, caregiver and/or grandparent of a child 18-35 months of age; b) must have lived in Canada for at least the past five years; c) must have good use of the English language; and, d) must be available at the time of the scheduled focus group at that location. Each site recruited participants from members of their organization.

Six focus groups, two in each of: a) Sudbury, ON, b) Hamilton, ON and c) York Region, ON, were recruited. This number was justified as Krueger (2000) recommends at least three to four groups, followed by additional groups as required to reach saturation, which is the point when no new ideas are emerging. In addition, the use of six focus groups for this phase in the preschooler NutriSTEP® item generation proved to be sufficient ( JA Randall Simpson, personal communication, 2010). Krueger (2000) also states the ideal size of a focus group is six to eight participants, thus requesting the centers recruit 12 participants would sufficiently account for those not showing up or cancelling.

The chosen sites were selected based on demographic diversity as outlined by Statistics Canada 2006 census results (Statistics Canada, 2007). Sudbury is a rural district, with a lower median annual family income ($57,008) than the province of Ontario ($69,156), as well as a high population of Aboriginals (13.5%). Hamilton is an urban city, with an average income ($66,810), and has a high percentage of lone parent families (18%). Lastly, York Region is also urban, with a higher than average income ($81,872), and a very large population of
immigrants (56%). Two groups were conducted at each site for ease of completion and efficient data collection.

4.3.2 Interview Guide

Interview guide questions (appendix C) were developed by the NutriSTEP® research team in an attempt to: a) gain parental input on the issues that were identified in the literature review (phase 1), and assess whether or not these issues would be indicative of nutrition risk in toddlers; b) gather parental opinions on the suitability of the preschooler NutriSTEP® questions for a toddler population; and, c) determine if parents identified any novel toddler nutritional issues not identified in prior NutriSTEP® research or in the literature. Interview guide questions were categorized according to the four originally identified nutrition risk constructs for preschoolers (food and nutrient intake, factors affecting food intake, physical activity & sedentary behaviour, & physical growth). Also, an additional nutrition risk construct, developmental and physical capabilities, was added based on risk factors identified through the literature review, which were not appropriate for inclusion within the other construct categories.

The focus group interview process was dynamic, involving multiple minor changes to questions during and between focus group sessions. Changes to the interview guide during the sessions were typically of a probing nature, used to obtain clarification when necessary, and those between sessions ensured that all topics were covered thoroughly and that emerging topics were explored further. NutriSTEP® research team consultations between focus groups were held to briefly discuss results from each session and obtain feedback regarding any interview guide changes to be made prior to the next group. Some examples of changes made to the interview guide included: addition of probes to questions based on potential items brought up in previous groups such as use of bedtime bottles, combination of fruit and vegetable intake questions etc.; separation of food group questions from other food
and fluid intake questions; and elimination of certain topics in final groups (food group intake questions) if consensus was consistent among all previous groups, this allowed more time to be spent on controversial topics or newly identified items.

4.3.3 Procedures

After each OEYC was selected to host a focus group they were provided with instructions regarding participant recruitment and planning. Members of our research team were in constant communication with the site coordinators to provide assistance/clarification when necessary and to provide guidance. Participants who indicated they would participate in the focus group received telephone calls from the coordinators 24-48 hours prior to the scheduled group, reminding them of the time and location. All groups were conducted during daytime hours, when parents would normally be participating in the organization’s regularly-scheduled activities. Furthermore, groups were scheduled in May and early June 2010 to avoid summer vacation as this would likely cause recruitment issues. Site employees, with whom the children were familiar, provided childcare for all participants during the focus group sessions.

Focus group set up, clean up and coordination was the responsibility of the research team. The sessions took place with participants and moderators seated around a table, and were initiated with introductions to the research team, followed with an icebreaker activity in order for participants to learn each other’s names and hopefully increase comfort level and identify commonalities between individuals in the group. Next, participants were provided the following forms in a package (appendix D): a) background information forms; b) informed consent forms; and c) parent information/demographic forms; each form was read aloud to ensure proper understanding and written consent was required. All participants were informed of their rights regarding voluntary participation and the ability to withdraw, without penalty, at any time. Incentives, which were $25 grocery vouchers, were provided to all
participants at the beginning of the session, and participants kept the incentive whether or not they remained in the group for its entirety. A small healthy snack was also provided to provide a welcoming atmosphere, help stimulate interaction and discussion on food.

Three individuals (JRS, JG and LR) were responsible for moderating the groups; two (JRS & JG) participated in professional moderator training prior to this, while the other had previous experience moderating group discussions. Each focus group was co-moderated by two of the three trained individuals. Professional moderator training took place over a 4-hour period and focused on procedures, methods and strategies to ensure that participants: felt welcomed and valued, equally participated and felt comfortable. Techniques and strategies were reviewed and practiced to deal with common issues often faced by moderators. Some topics discussed included: using warm-up or “ice breaker” activities to develop rapport with participants and encourage group members to communicate with each other; reflecting back on both individual and group discussion to ensure accuracy of the moderator’s interpretation; refraining from passing judgment in regards to participant comments; calling upon quite/shy participants to speak and contribute to discussion, in an attempt to control dominant speakers and encourage equal participation; and phrases/suggestions for diffusing conflict among group members.

Following introductions and administrative tasks, the interview guide questions were followed for the remainder of the discussion, which was approximately one hour. Participants were reminded to speak clearly throughout the session, as well as one at a time and to be respectful of others. Each focus group discussion session was audiotaped using three recorders located at various locations on the table in order to capture all voices clearly, as well as to provide backup if the main recorder did not work properly. At the end of the sessions, parents were provided time to ask any questions to a member of the research team who was also a registered dietitian (RD). Having an RD available for focus group
participants is important as parental concern may develop during discussion regarding their child’s nutrition and eating habits, as well as their own feeding practices. Thus, to deal appropriately with these concerns, parents were asked to save any questions in this regard to the end of the discussion when they would have the opportunity to ask them. Also, providing parents with this service may have encouraged them to also assist the researchers through discussion participation. Parents were also given pediatric nutrition resources, as well as resources specific to their communities, which were provided to us by local public health units.

Two research assistants were note-takers for the entirety of the project; at least one of the two was present in each group. These notes were used during analysis and transcription to identify speakers and note nonverbal communications. A single research assistant transcribed each audiotape into a Microsoft Word document. The transcriptions from the Sudbury morning group, as well as the initial York Region group, were then reviewed by a NutriSTEP® researcher, while simultaneously listening to the tapes, to check for errors. There were no disagreements in these two transcripts between the audio recordings and the transcription documents, and thus it was concluded that all transcripts were appropriate for analysis.

Ethics approval for these focus groups was granted by the University of Guelph Research Ethics Board (see attached appendix B).

4.3.4 Analysis

Each focus group transcript was summarized by a NutriSTEP® researcher (JG) into six documents outlining key points. These documents were then analyzed by each member of the research team individually (JRS, HK, LR, JB), and discussed as a group. This research team consultation involved discussion of results from both phase 1 (literature review) and phase 2
(focus group) and led to a consensus upon the initial draft (Draft 1) question stem themes and initial wording to be included on the toddler NutriSTEP® questionnaire.

4.4. Phase 3: Pediatric Nutrition Expert Opinion

The third phase of the study was also qualitative, allowing researchers to gain valuable input from pediatric nutrition experts through use of an online survey, as well as a group teleconference discussion. Gathering expert opinion of the initial toddler NutriSTEP® draft item stems was important for multiple reasons. Primarily, as stated previously, their input assisted with item generation and consideration of all potential toddler nutrition risk factors. However, assessment of item stem wording and language, although outside the scope of this thesis project, is also very important (Keszei et al., 2010). Use of clear and easily interpreted, unambiguous language is very important, especially with a parent-administered questionnaire (Keszei et al., 2010). Therefore, creating draft item stems written as questions, rather than simply listing potential risk factors, was important to avoid ambiguity and thus, varying individual interpretation, as well as to gather input for future phases in regard to question wording and language used.

4.4.1 Survey

An online Survey Monkey questionnaire (appendix E) was used to gain feedback from pediatric nutrition experts on the 21 item stems included in Draft 1 of the Toddler NutriSTEP®. Pediatric dietitians were asked to assess the following: a) their level of agreement with the inclusion of each item theme as part of the construct being measured (e.g., food intake) and its relative importance to the construct; b) within each construct, the rank order of importance of each individual item stem, (e.g. within the construct of food intake, was assessing fruit juice intake more important than vegetable intake); and, c) the initial wording of each item stem. An introduction letter preceded the online survey, which
described the survey instructions and provided definitions for any terms that participants may not be familiar with such as nutrition risk and screening.

4.4.1.1 Survey Development

The NutriSTEP® research team members developed the 17-question survey with Survey Monkey, a web-based survey tool. Questions were mostly closed-ended; however, there were open-ended questions to allow participants to make comments. Each of the 21 draft item stems were grouped into one of the previously stated five nutrition risk categories. Regarding each construct, there were three questions asked of participants.

The initial question required participants to rank the importance of each item stem within the category as very important, somewhat important, slightly important or not important. This question was used to determine which item stems within each category were of greatest importance to the dietitians, allowing researchers to then determine if any questions were unnecessary to assess the construct, as well as to provide rationale for inclusion of some but not other items. The second question asked participants to rank order each item stem in relation to the other stems in the category. This question was used to determine which questions were the most important within the category. This allowed researchers to eliminate item stems that; although they may be ranked as important in step 1, may not be the most important to the specific nutrition risk construct. This provided researchers with a method of ensuring that the final NutriSTEP® questionnaire was limited to the minimum number of questions, thus reducing participant burden. The final question under each category was open-ended and used to capture any comments participants had about the wording of any of the draft item stems. Following the individual category questions, participants were asked to rank the overall importance of each nutrition risk construct, as well as provided with the opportunity to leave overall general comments. Lastly, brief demographic questions were included at the end of the survey. The survey was designed to take approximately 15 minutes
to complete, providing minimal respondent burden. Prior to use, the survey was pre-tested with two local dietitians. These individuals completed the Survey Monkey questionnaire and provided comments/suggestions for improvement, as well as their approximate time to complete it. Following this, the survey was finalized and reviewed by all research team members.

4.4.1.2 Participants

The target population for this phase of the study was registered dietitians with some pediatric working experience who were familiar with the concept of nutrition risk in the toddler age group. Recruitment took place via email; a group of 12 pediatric dietitians previously involved in NutriSTEP® research were emailed and notified about the current research. These 12 individuals were diverse in that they represented different provinces and work experiences (i.e., pediatric clinics and community), but all were familiar with the concept of NutriSTEP® and nutrition risk screening. This was considered important to ensure quality information and to not have the objective of identifying core items diverted into issues of the value of screening itself. The desired sample size was eight to ten individuals; this was in order to keep the number of participants in the follow-up teleconference discussion group manageable for a meaningful discussion. This was based on focus group size recommendations to limit groups to a maximum of 10 participants to maintain control (Krueger et al., 2000). Streiner & Norman (2008) states that rules in regards to the number of experts to consult, or how to select experts are not available. However, more common approaches included between three and ten participants who are known to those developing the scale, are consulted usually on an individual basis. Participants were also asked to notify us of any others who were qualified, and interested in participating. Researchers provided those invited with two weeks to identify their intent to
participate; within this period, 13 dietitians from five provinces across Canada agreed to participate.

4.4.1.3 Procedures

Following recruitment, an invitation to participate was sent to the 12 dietitians who indicated intent to participate (appendix F). This letter outlined the project background information, objectives of the study and participant requirement. Attached to this letter was a list of definitions for terms used to describe the project and used to ensure a common terminology for participants. In early August 2010 the finalized survey (procedures described previously) was made available to those participants who indicated intent to participate via the Survey Monkey link, which was included in an email, along with instructions and a timeline for completion. Researchers provided participants with one month to complete the survey; this timeframe was thought to be sufficient enough to account for summer vacations etc. Participants were also sent a reminder email one week prior to the end of the one-month period. Also at this time, participants were asked to provide their availability for a teleconference discussion by indicating preference for one of three potential dates. Researcher names and emails were provided to all participants in case of questions or concerns. Lastly, participants were notified that after participation in both the survey, as well as the teleconference, they would receive a $25 Chapter’s gift card.

4.4.1.4 Analysis

To assess dietitian’s perceived overall importance of each item stem, the percent of total participants ranking the stems as each of the four response options (very important, slightly important, somewhat important and not important) were calculated. The dietitian’s perceived order of importance of item stems within each category was determined based on calculated weighted average ratings. The weighted average ratings were calculated by first assigning each rating option within the category a corresponding
numerical value. Following assignment of numerical values, these values were multiplied by the frequencies of respondents ranking an item stem at each specific value. For example, if six participants ranked “consumption of milk products” as the most important item stem in the food and fluid intake category, the assigned numerical value (1) would be multiplied by the frequency of respondents (6). Following calculating these frequency values for each rating option, they were summed together and divided by the total number of responses to provide a weighted average. For example, referring back to the “consumption of milk products” item stem, if there were 12 participants in total, and six rated this item as number 1 in the category, while six rated this item as number 4 in the category, the weighted average ranking for the consumption of milk products stem would be: \([([6*1] + [6*4])/12] = 2.5\). Lastly, any qualitative comments were summarized according to the item stem they corresponded with; each member of the research team reviewed all results independently. Following this consultation, these responses were used to develop an interview guide for the follow-up teleconference discussion.

4.4.2 Teleconference Discussion

The teleconference discussion guide (appendix G) was developed with the objective of gaining clarification on survey responses where necessary, and attempting to come to a consensus on which item stems, if any, to remove and/or modify. For example, if survey results indicated that an item stem was unimportant, this would be addressed further in the teleconference prior to removal from the draft questionnaire. Discussion questions were separated into the five nutrition risk constructs to maintain consistency with the survey questions. Within each construct, a short summary of the group’s suggested modifications based on survey results was provided, followed by the newly proposed item stem(s), and discussion questions to gather feedback and reach consensus.
4.4.2.1 Participants

As the teleconference discussion was a follow-up to the online survey, the participants for the teleconference discussion were recruited from those who completed the online survey. These individuals were informed of this second phase at enrollment at recruitment.

4.4.2.2 Procedures

Participants completing the online survey were asked via email to indicate their availability for a teleconference call; based on these responses the date for the phone call was chosen to accommodate the maximum number of participants. This date was communicated via email approximately two weeks prior to the selected date. At this time participants, were also provided with the phone number for the teleconference line, as well as the pass code for the specific discussion. Any participants unavailable during the chosen time slot were provided with the teleconference discussion guide questions via email, and asked to provide written feedback prior to the teleconference discussion. Participants providing this written feedback were informed that their responses would be summarized and presented in the discussion. Reminder emails were sent to all participants one week, as well as three days prior to the discussion. A member of the NutriSTEP® research team (HK) led the discussion following the discussion guide closely and ensuring consensus was reached on each topic. Following the discussion participants were sent a thank-you email, as well as their incentive, a $25 Chapters gift card, which was mailed to the address they provided.

4.4.2.3 Analysis

Members of the research team reviewed and discussed survey and teleconference responses. Based on this consultation, some questions were modified or removed from the questionnaire, and many wording changes were made in an iterative process, which is outside of the scope of this thesis.
4.5. Summary and Next Steps

In summary, this study involved multiple forms of data collection, including both qualitative and quantitative methods, to gather input and feedback from various sources, including literature, parents, and pediatric nutrition experts. This multiphase methodology was necessary to ensure all potential nutrition risk factors for toddlers were considered for inclusion on the draft Toddler NutriSTEP® questionnaire. Next steps in the development of the Toddler NutriSTEP® not included within the scope of this thesis project include: key intercept interviews, test-retest reliability, and criterion validation.
5.0 Results

The results from each phase of the current study will be presented separately in the following section. These results will be integrated and discussed further, in the following Discussion, in which comparisons of findings from each phase will be made in order to provide justification for the final selected questionnaire items.

5.1 Phase 1: Identification of Nutrition Risk Constructs and Item Themes for Toddler NutriSTEP®

Literature regarding NutriSTEP® nutrition risk constructs in toddler-aged children was limited, with most North American data collected from two studies: Continuing Survey of Food Intakes by Individuals (CSFII) and the Feeding Infants and Toddlers Study (FITS). This review focused on North American data, as this is the main population that will utilize the NutriSTEP questionnaire. To the best of our knowledge, there were no National Canadian data relating to food and fluid intake of toddlers between 18 and 35 months, and with the exception of food insecurity prevalence, no Canadian data was identified for the other constructs.

The Agricultural Research Service (ARS) of the U.S. Department of Agriculture (USDA) conducted the CSFII to collect data regarding food consumption of Americans (1994-96, 1998). The initial study (1994-96) collected data on individuals of all age; however, data from children under nine years of age were limited. In 1998, data were further collected on food consumption of children from birth to nine years of age (Devaney, 2004). The total sample was nationally representative and included 2118 children between the ages of one and three years (USDA, 1999). One significant limitation was the exclusion of breastfed infants and toddlers. More recently, in 2002, The FITS study, sponsored by the Gerber Products Company, was conducted to increase knowledge regarding food and fluid intake of all infants
and toddlers in the US (Devaney, 2004). It included a national random sample of 3,022 parents and caregivers of infants and toddlers four to 24 months of age.

Results of the literature review indicated that no current parent-administered screening tool was available for this age group and targeted on a community-living population. Two nutritional screens from British Columbia were identified, however, they required health professionals, rather than parents, for completion (Richards & Wilkonson, 1998 & Yeung, 1998). In addition, the PEACH (Parent Eating and Nutrition Assessment for Children with Special Needs) survey assesses nutrition risk in children, however it is specific to children with developmental delays and disabilities (Campbell & Kelsey, 1994). Also, a nutrition risk screening measure for children was developed in Paris, France, however it was designed for use in a hospital setting (Sermet-Gaudelus et al., 2000).

Furthermore, results indicated that nutritional issues measured on the preschooler NutriSTEP® are all likely applicable to toddlers (see Table 5.1 for more details on results of the literature review). Other issues, indicative of nutritional risk specifically in toddlers, which were therefore not included on the preschooler NutriSTEP® included: excess milk consumption, including breastmilk and formula (Skinner, 2004); introduction of complementary foods with low nutrient density (Fox, 2004); excess intake of fruit juices and sweetened beverages (Fox, 2004 & Fox, 2006a); picky eating/lack of dietary variety (Carruth, 2004a); development of an inappropriate parent-toddler feeding relationship (Satter, 1990); insufficient exposure to new foods (Birch, 1982); and prolonged bottle and/or “sippy-cup” use (Birch, 1982 & Bonuck, 2010)

This analysis identified that a potential new construct of physical and developmental capabilities, focusing upon feeding issues, was needed as well in the Toddler NutriSTEP. These results were used to develop the interview guide for focus groups with parents of toddlers (appendix C). Specifically, questions garnered parent/caregiver’s opinions of the
appropriateness for toddlers of the current preschooler NutriSTEP® questions, and also on those toddler-specific nutrition issues identified in the literature.

5.2 Phase 2: Parental Focus Groups

Six focus groups with parents of toddlers (18-35 months) were conducted in May and June of 2010, in both southern and northern Ontario, Canada. As shown in Table 5.2, most participants were Caucasian females between the ages of 18 and 64. There was an average of eight participants per focus group, ranging from six to eleven. Each group lasted for approximately an hour in duration. Results were summarized for each location, and have been combined into a single document identifying all parental opinions, concerns and suggestions (appendix H).

Parents indicated that almost all item stems currently on the preschooler NutriSTEP® (appendix A) were important to include on a toddler version; however, some modifications were recommended. Specifically, these included: addition of breast milk, formula and fortified milk beverages as milk product examples; combining separate fruit and vegetable intake questions into a single question; and, clarifying the definition of fast food. Parents thought that a question about physical activity was inappropriate for this age group as toddlers usually play, rather than participate in structured physical activity. Furthermore, parents identified many nutritional issues, not included on the preschooler NutriSTEP®, but believed to be important for a toddler version. Many of these were identified in the literature review; however, others were novel, including: addition of other sedentary behaviour examples such as reading and time spent in car seats and/or strollers; and, the influence of sleep and routine upon eating behaviours. These novel issues, although likely to influence toddler’s nutrition, were not included in the final draft for various reasons, which are discussed further in subsequent discussions.
Based upon parental feedback from focus groups, 29 questions were included in draft 1a (appendix I). After extensive research team consultation, 21 of the 29 items were included on Toddler NutriSTEP® draft 1b (appendix J) (16 of the preschooler NutriSTEP® questions, with modifications, and five additional questions). Following completion of the Toddler NutriSTEP® draft 1b, the online survey was developed (appendix F) to be used in the subsequent phase to garner pediatric nutrition expert opinions on the importance and/or wording of the selected question stems.

Table 5.1: Preschooler NutriSTEP nutritional risk themes: Summary of literature regarding risk in toddlers

<table>
<thead>
<tr>
<th>Nutritional Risk Theme</th>
<th>Literature Summary</th>
</tr>
</thead>
</table>
| Grain product intake                                       | • 99.2% of toddlers consume grain products at least once in a day (Fox, 2004a)  
• Most commonly consumed grain products include: non-infant cereal (23% of toddlers consuming sweetened cereals); breads and rolls; and crackers, pretzels or rice cakes (Fox, 2004a) |
| Milk product intake                                        | • Average daily milk intake of US toddlers (2.25 c) (Fox, 2004a) is greater than the Dietary Guidelines for Americans recommended milk intake for toddlers aged 2-3 (2 c per day) (USDA, 2010)  
• Many toddlers also consume yogurt (15%) and cheese (41%) (Fox, 2004a) |
| Fruit intake                                               | FITS data indicates that 18-33% of toddlers consumed no discrete servings of vegetables or fruits on a daily basis (Fox, 2004a)  
| Vegetable intake                                            | Most toddlers are consuming meats and/or alternatives on a regular basis, however high fat & sodium choices (hotdogs, cold cuts etc.) are consumed by 20-30% (Fox, 2004a)  
| Meat, fish, poultry or alternatives intake                | No data in toddlers  
• Consumption of fast food negatively effects dietary quality in older children (Bowman, 2004)  
| Fast food intake                                           | 9.2% of Canadian households experience food insecurity (Kirkpatrick, 2008).  
• Food insecurity, with or without hunger, may negatively affect children’s health and decrease dietary variety (Kirkpatrick, 2008)  
| Food insecurity                                             | Development of various motor skills necessary for self-feeding have been shown to impact nutrient intake in infants and toddlers (Carruth, 2004b)  
| Problems chewing, swallowing, gagging or choking while eating |
| Excess fluid consumption resulting in diminished appetite at mealtime | • Juice and fruit flavored drink consumption are 2\textsuperscript{nd} and 3\textsuperscript{rd} most important energy sources in toddler’s diets (Fox, 2006).  
• May be harmful due to excess caloric intake, excess sugar intake and/or displacement of nutritious foods. |
|---|---|
| Number of eating occasions per day | • Toddlers eat, on average, 7 times per day (Skinner, 2004a)  
• Caloric intakes are 31% higher, on average, than the mean EER value (Devaney, 2004). |
| Parents allow child to decide how much to eat | • Parents may resort to inappropriate feeding strategies in an attempt to encourage eating and manage “picky” eating, a common occurrence in toddlers (Carruth, 2004a)  
• Infants and toddlers possess the ability to self-regulate their caloric intake; however, it is often diminished during toddler years (Fox, 2006b)  
• The use of rewards and/or coercion to promote food consumption, as well as restriction and pressuring techniques, have all been shown to have negative effects on young children’s eating habits (Birch, 1980, Birch 1984, Newman, 1992, & Galloway 2006) |
| Child eats meals while watching TV | • No related literature in toddlers  
• Research in older children indicates potential association between mealtime TV watching and negative eating habits (Coon 2001). |
| Supplement consumption | • Healthy toddlers should not require supplements to achieve adequate intakes of most nutrients (Devaney, 2004)  
• 32% of toddlers are using supplements at 24 months of age (Briefel, 2006).  
• Many toddlers receiving supplements exceed recommended intake amounts for many vitamins and minerals (Eichenberger Gilmore, 2005) |
| Amount of physical activity | • No Canadian recommendations on physical activity for toddlers  
• National Association of Sport and Physical Activity recommend that toddlers should get 30 minutes of structured physical activity and 60 minutes of unstructured play per day (NASPA, 2011) |
| Time spent watching TV, playing video games or using computer | • AAP recommendation to limit “entertainment media” to less than 2 hours per day for children over 2 years of age (AAP, 2001)  
• 41% of toddlers 24-35 months in the US watched more than 3 hours of TV per day (Certain, 2002)  
• 16% watched more than 5 hours per day (Certain, 2002). |
| Comfort with child’s growth | • Relationship between parental perception of growth is often inaccurate and this may be associated with inappropriate feeding practices (Laraway, 2010) |
| Child is the right weight or should weigh more/less | • 21% of children aged 2-5 are overweight/obese (Shields, 2006) |
Table 5.2: Focus Group Participant Demographic Information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Total number = 48)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt; 20 years</td>
<td>1</td>
</tr>
<tr>
<td>20-39 years</td>
<td>41</td>
</tr>
<tr>
<td>40 + years</td>
<td>6</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>45</td>
</tr>
<tr>
<td>Single</td>
<td>2</td>
</tr>
<tr>
<td>Mean Annual Household Income</td>
<td></td>
</tr>
<tr>
<td>&lt; $30000</td>
<td>15</td>
</tr>
<tr>
<td>$30000 - 59000</td>
<td>10</td>
</tr>
<tr>
<td>&gt; $60000</td>
<td>19</td>
</tr>
<tr>
<td>Highest Level of Education</td>
<td></td>
</tr>
<tr>
<td>Some High school</td>
<td>6</td>
</tr>
<tr>
<td>Graduated High school</td>
<td>3</td>
</tr>
<tr>
<td>Some College/University</td>
<td>8</td>
</tr>
<tr>
<td>Graduated College/University</td>
<td>30</td>
</tr>
<tr>
<td>Ethnicity of Mother</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>20</td>
</tr>
<tr>
<td>Chinese</td>
<td>11</td>
</tr>
<tr>
<td>Other*</td>
<td>8</td>
</tr>
</tbody>
</table>

*Other includes: First Nations & South Asian

5.3 Phase 3: Pediatric Nutrition Expert Opinion

Thirteen dietitians from five provinces (see Table 5.3 for participant demographics) completed the online survey to provide feedback regarding the item stems selected in phase 2, and to give suggestions for any other nutritional issues that may be important to include on the toddler NutriSTEP®. All items were ranked as "very important" by at least 50% of respondents, with the exception of four questions (see table 5.4 for a summary of results from the online survey); this indicates that for the most part, drafted questions tapped the perceived constructs of nutrition risk for this age group. It is important to note that for questions asking participants to rank the item stems in relation to the others
within a category, responses from two participants were excluded as these individuals ranked multiple items equally rather in relation to each other.

In addition to ranking items, participants also provided qualitative comments and/or feedback. Some commonly expressed suggestions/comments included: clarifying the definition of fast food; defining and giving examples of supplements; clarifying the definition of baby food; removing or rewording the car seat and stroller usage question; and, elimination of the question assessing parent’s perception of child’s weight.

**Table 5.3:** Demographics of Dietetic Professionals participating in review of draft Toddler NutriSTEP® questions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage of Total Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
</tr>
<tr>
<td>Location of Practice</td>
<td></td>
</tr>
<tr>
<td>Ontario</td>
<td>5</td>
</tr>
<tr>
<td>BC</td>
<td>1</td>
</tr>
<tr>
<td>Alberta</td>
<td>4</td>
</tr>
<tr>
<td>Manitoba</td>
<td>1</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>2</td>
</tr>
<tr>
<td>Type of Practice</td>
<td></td>
</tr>
</tbody>
</table>
**Table 5.4:** Rating by pediatric nutrition expert review of draft Toddler NutriSTEP questions

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item Stem</th>
<th>Importance (%)</th>
<th>Order of Importance</th>
<th>Order of Importance Within Construct (# in descending order of importance)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food &amp; Nutrient Intake</strong></td>
<td>My child usually eats meat, fish, poultry or alternatives. Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils.</td>
<td>91.7</td>
<td>8.3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>My child usually has milk products. Examples are breastmilk, formula, white or chocolate milk, cheese yogurt, milk puddings or milk substitutes such as fortified soy beverages.</td>
<td>91.7</td>
<td>8.3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>My child is not hungry at mealtimes because he/she drinks all day.</td>
<td>91.7</td>
<td>8.3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>My child usually eats vegetables.</td>
<td>91.7</td>
<td>8.3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>My child usually eats restaurant or take-out fast foods.</td>
<td>66.7</td>
<td>33.3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>My child usually eats _____ times per day.</td>
<td>50</td>
<td>41.7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>My child usually eats fruit.</td>
<td>83.3</td>
<td>16.7</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>My child usually eats grain products. Examples are bread, bagel, bun, cereal, pasta, rice, roti and tortillas.</td>
<td>66.7</td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>My child usually takes supplements</td>
<td>16.7</td>
<td>66.7</td>
<td>9</td>
</tr>
<tr>
<td>Physical Growth</td>
<td>I think my child weighs (too little/too much)</td>
<td>41.7</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------</td>
<td>------</td>
<td>----</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>I am comfortable with how my child is growing.</td>
<td>41.7</td>
<td>33.4</td>
<td>2</td>
</tr>
<tr>
<td>Developmental &amp; Physical Capabilities</td>
<td>My child has problems chewing/swallowing/gagging/choking when eating.</td>
<td>84.6</td>
<td>15.4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>My child usually feeds his/her self.</td>
<td>53.8</td>
<td>38.5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>My child usually takes a bottle to bed.</td>
<td>84.6</td>
<td>15.4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>My child usually drinks from a bottle.</td>
<td>53.8</td>
<td>30.8</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>My child usually eats baby food.</td>
<td>53.8</td>
<td>30.8</td>
<td>5</td>
</tr>
<tr>
<td>Physical Activity &amp; Sedentary Behavior</td>
<td>My child usually watches TV, uses the computer, or plays video game</td>
<td>53.8</td>
<td>38.5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>My child usually sits in a stroller or car seat</td>
<td>7.7</td>
<td>46.2</td>
<td>2</td>
</tr>
<tr>
<td>Other Factors Affecting Food Intake</td>
<td>I have difficulty buying food to feed my child because food is expensive.</td>
<td>76.9</td>
<td>7.7</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>I usually let my child decide how much to eat.</td>
<td>76.9</td>
<td>23.1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>My child usually eats meals while watching TV.</td>
<td>84.6</td>
<td>15.4</td>
<td>3</td>
</tr>
</tbody>
</table>

Based on the survey results, a discussion guide for the subsequent teleconference was developed (appendix G). Questions were designed to garner clarification from participants regarding their survey responses, and also to reach consensus on modifications required. Of the 13 survey respondents, 11 also provided feedback at this
second stage. Five of the 11 provided written feedback, following the questions on the discussion guide, as they were unavailable at the time of the teleconference. Issues that were discussed further in the teleconference discussion included: clarification regarding why a question on growth pattern was more important than a question about the toddler’s weight status; how to provide more detail to avoid confusion around the physical capability questions (e.g., what are pureed foods?); whether a single sedentary behaviour question is sufficient for the construct of physical activity and sedentary behaviour; and, the potential combination of fruit and vegetable intake questions. Based on this written feedback, as well as feedback from the discussion participants, various item stem modifications, additions and deletions were made to draft 1b (see Table 5.5 for a summary of these changes and rationale) resulting in a final draft Toddler NutriSTEP® containing 19 question stems (appendix K).

**Table 5.5:** Pediatric nutrition experts and research team modifications to Toddler NutriSTEP draft 1b with rationale (phase 3 results)

<table>
<thead>
<tr>
<th>Phase 3 (Pediatric Nutrition Expert Opinion)</th>
<th>Pediatric Nutrition Expert &amp; Research Team</th>
<th>Selected Question Stem</th>
<th>Additions/Removals/Modifications</th>
<th>Supporting quotes and/or teleconference discussion correspondencea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination of separate fruit intake, and vegetable intake questions into a single question</td>
<td></td>
<td></td>
<td>“Could combine the F/V questions into one question” • Most dietitians agreed with this statement, expressed this was a possibility to eliminate unnecessary question</td>
<td></td>
</tr>
<tr>
<td>Additional question “My child usually drinks juice or flavored beverages”</td>
<td></td>
<td></td>
<td>“I think you need to have specific questions regarding MILK and JUICE consumption alone - as too much of either of these can affect nutrition risk in toddlers”</td>
<td></td>
</tr>
<tr>
<td>Changes</td>
<td>Rationale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removed “usually” from multiple question stems (My child feeds his/her self; my child drinks from a baby bottle; my child eats pureed foods; I let my child decide how much to eat; and my child usually takes supplements)</td>
<td>“The word &quot;usually&quot; can be quite subjective depending on the individual parents filling out the questionnaire”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changed term baby food to pureed foods</td>
<td>“Clarify what is meant by baby food pureed starter foods or toddler choices that have chunks and require more chewing?”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changed “My child is not hungry at mealtimes because he/she drinks all day” to “My child is not hungry at mealtimes”</td>
<td>• Dietitians expressed that a separate question addressing juice consumption, as well as a milk product consumption question would address the issue of excess fluids, also, a lack of hunger at mealtimes may be a result of other factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes “My child eats meals while watching TV” to “My child eats meals while watching TV, or being read to, or playing with toys”</td>
<td>• Dietitians suggested incorporating other examples of distractions commonly used at mealtimes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Added meal replacements as an example of supplements</td>
<td>• Dietitians expressed many parents would not consider meal replacements, such as Pediasure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removed bedtime bottle question</td>
<td>• Risk is related to oral health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removed stroller/car seat time question</td>
<td>“The first question isn't clear enough -doesn't make sense to me as written. It's too vague. You want a child to sit in a car seat for safety reasons so I don't think it is a good question to get at the sedentary behaviour of the child”</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"Rationale provided based upon qualitative results of online survey and correspondence from teleconference discussion with pediatric nutrition experts"
5.4 Summary

Results from each phase of this study contributed to the final draft Toddler NutriSTEP® containing 19 question stems (appendix K). Four novel nutrition risk questions regarding consumption of juices and sweetened beverages; self-feeding; bottle usage; and consumption of pureed foods, were added to the preschooler NutriSTEP® questionnaire.

Also, the two questions measuring fruit intake, and vegetable intake separately were combined together, and a question assessing structured physical activity was removed.

Many changes and alterations to the remaining questions were made based on input from all participants, and research team consultation.
6.0 Discussion

Following this extensive and iterative process, input from many key individuals was considered in the identification and selection of 19 questions relating to toddler-specific nutrition risk.

Providing justification for chosen items and/or constructs is emphasized by Keller et al. (2000), who provided a framework for developing nutrition risk screening and other health measurement questionnaires. Therefore, in an attempt to provide this justification, the following sections will discuss, in detail, the results from all phases of the current study, and comparisons between literature findings, parental input, and pediatric nutrition expert opinions by construct and where appropriate, by specific item.

This will be followed by a comparison of the initial phase of the toddler NutriSTEP development to other similar nutrition screening tools.

6.1 Food and Fluid Intake

6.1.1 Food Group Intake

Parents, as well as most experts in this data collection, expressed that questions about consumption of all food groups were important. Many parents stated that toddlers often only consume foods from one or two of the food groups, potentially causing nutritional issues. These statements are similar to findings from the literature, where inadequate numbers of servings from various food groups are reported frequently in toddlers (USDA 1999; Fox 2004).

Many parents believed that breast milk and formula should be considered on the questionnaire as some toddlers may still be consuming these at this age. This was not surprising as the Canadian Pediatric Society (CPS), American Academy of Pediatrics
(AAP), and World Health Organization (WHO) recommend continuing breastfeeding along with complementary foods until 24 months of age (CPS 2005, Kramer 2001, Gartner 2005). Some parents, however, did not think these additions were necessary; they thought that, by 18 months, toddlers would not be consuming either of these. This is supported by findings where only 4.5% and 1.5% of toddlers aged 19-24 months participating in the Feeding Infants and Toddlers Study (FITS) were consuming breast milk and formula, respectively (Fox, 2004). Results of the focus groups suggested that not all parents are aware of, or follow, the CPS, AAP, or WHO recommendations suggesting a knowledge gap; also, dietitians further confirmed the importance of including these on the Toddler NutriSTEP®. Therefore, the research team decided that including these as examples of milk products would provide a comprehensive list, and also increase parental awareness of this important recommendation.

Some parents also suggested combining the separate fruit and vegetable questions. Their reasoning was to keep the questions about food groups similar to Eating Well with Canada’s Food Guide food groups. On the other hand, many parents also expressed that their children were much more likely to eat fruits than vegetables, and thus keeping the questions separate would capture this potential concern. This was surprising as data from the FITS indicated that, of those toddlers aged 19-24 months, approximately 82% consumed vegetables and 68% consumed fruits at least once a day (Fox, 2004). Based on further recommendation from the dietitians to combine these two questions, the research team decided that this was appropriate as this would also allow an additional question regarding another important nutrition risk indicator.
Another suggestion from parents was to include a question about consumption of reduced fat milk. Again this was not surprising as the CPS recommendation is that skim milk is inappropriate in the first two years of life, and also that partly skimmed milk (1% or 2%) is not routinely recommended (CPS, 2005). Despite the recommendations, parents state that some toddlers may be given low-fat milk due to the cheaper cost, while others were completely unaware of the CPS recommendations and were using these lower fat milks out of convenience for the entire family. Researchers decided however, that this was not an appropriate question to include on the toddler NutriSTEP®. This decision was due to contrasting AAP recommendations to provide reduced fat milk for young children (12-24 months) if overweight or obesity is a concern, or if family history indicates that this would be appropriate (Daniels, 2008). The other deciding factor was the lack of expressed concern on this topic from the pediatric dietitians; it was not considered (as) relevant to their concept of nutrition risk.

Many parents also suggested addition of a question regarding consumption of “other” foods, including candy, sweets, and “junk foods”. This suggestion is also supported by literature, as approximately 75% of toddlers (19-24 months) consumed at least one of the foods categorized as “desserts and sweets” on a daily basis (Fox, 2004). However, deciding upon a term to represent the appropriate frequency of consumption, as well as an operational definition, would be very difficult. Parents also identified that defining these foods for all users would be challenging. It was this difficulty, as well as the awareness that identifying the associated risk associated with these foods would also be almost impossible, that resulted in the research team decision not to include a question on consumption of “other” foods.
6.1.2 Juice and Sweetened Beverage Consumption

Parents reported that toddlers frequently consume fruit juices and sweetened beverages, and therefore recommended adding a specific question asking about this concept. This suggestion was justified, as this issue was also identified in the literature review. FITS data indicate that juices and fruit flavored drinks were the second and third most important sources of energy in toddlers' diets, making up approximately 11% of total energy intake (Fox, 2006a). Furthermore, also from this study, average daily juice and sweetened beverage intake amounts for toddlers 19-24 months (9.5 ounces) exceeded the AAP guidelines, which recommend limiting juice intake to 4-6 ounces per day (Committee on Nutrition, 2001). Many parents were aware that 100% fruit juices can be a positive contribution to dietary intake of toddlers; however, they should be consumed in moderation to avoid displacement of nutritious solid foods (Skinner, 2004b). In addition, approximately 11% of toddlers participating in the FITS study consumed carbonated beverages (Skinner, 2004b), although our focus group parents did not consider this issue to be sufficiently common in this age group. NutriSTEP® researchers initially agreed that the nutritional risk associated with excess juice and/or sweetened beverage consumption could be addressed by the question regarding toddler’s lack of hunger at mealtimes due to excess fluid intake in general. However, dietitians expressed that parents generally do not associate their child’s lack of mealtime hunger with excess juice consumption. Thus, they recommended a separate question specific to juice and sweetened beverage consumption, and NutriSTEP® researchers agreed.
6.1.3 Fast, Processed, and Convenience Food Consumption

Although no literature was identified that examined fast food intake specifically in toddlers, data from the FITS study indicated that approximately 43% of toddlers (15-24 months) consumed at least one meal away from home in a day (Ziegler, 2006). Furthermore, with approximately one quarter of Canadians reportedly consuming some form of fast food product(s) in a day, (Statistics Canada, 2007), and research indicating that food preferences of toddlers, and older children, are influenced by parental and sibling preferences (Skinner 1998, Hannon 2003), it is likely that toddler fast food consumption is also common. During our focus groups, parents confirmed that fast food consumption was common in toddlers, and thus an important topic to include on the questionnaire. However, many parents felt that the term ‘fast food’ needed to be defined in the questionnaire, possibly by providing examples. Suggestions to refer specifically to restaurant fast food were common; however, others noted that this would not be appropriate as there are often “healthy” options at these restaurants. Many parents, as well as most dietitians, reported that toddlers commonly consume processed or convenience foods at home, and that this should be considered as a separate issue from fast foods. However, research team consultation identified that defining processed or convenience foods would be very difficult, and the lack of related literature or recommendations would cause difficulty when attempting to identify the associated nutritional risk with inclusion of this concept. It was also decided among NutriSTEP® researchers to limit the definition of fast food to include only take-out and/or restaurant foods; this should eliminate confusion surrounding whether processed, convenience, and/or prepackaged foods are included. In response to parental concern relating to
toddlers who may consume healthier options at fast food restaurants, the research team stated that these individuals would likely score lower risk based on other questions, such as fruit and vegetable intake and as overall risk requires the triggering of several items, this behaviour would be weighted out. In addition, dietitians expressed that, regardless of the type of food, if toddlers are consuming food from fast food outlets, take-out or restaurants frequently, this is an indication of the caregiver’s value regarding nutrition and feeding.

6.1.4. Fluid Consumption and Mealtime Hunger

Parents believed that a question asking about excess fluid consumption and effects upon mealtime hunger in toddlers was important. Although some did not believe this was a serious issue, many stated that toddlers consumed more fluids than older children, especially milk and, as stated previously, juices. Literature findings also suggested that these issues are important to consider. In addition to the previously-discussed excess fruit juice and sweetened beverage consumption, FITS data indicate that toddlers consumed an average of 2.25 cups of milk per day (Skinner, 2004b), which exceeds the AAP recommendation of 2 cups per day for children between 1 and 3 years of age (Gidding, 2005). These findings are quite troublesome as excessive beverage consumption, including milk and/or juices, can result in displacement of nutritious complementary foods for this age group (Skinner, 2004b).

As described previously, based on dietitian input indicating that parents will not identify the relationship between fluid consumption and a lack of hunger at mealtimes, two separate questions (lack of hunger at mealtime, and juice and/or sweetened beverage consumption) were chosen for inclusion on the questionnaire.
6.1.5. Meal and Snack Patterns

When examining meal and snack patterns, FITS results showed that infants and toddlers consumed on average seven meals and/or snacks per day, with toddlers (12-24 months) consuming approximately 25% of their daily energy intake in snack form. This is not surprising as the most frequently-consumed snack foods included cookies, crackers, chips and candy (Skinner, 2004a).

Parents expressed that the number of eating occasions per day was an important item to consider for the questionnaire, as many stated, similarly to the literature, that their toddlers were “grazers” and would consume snacks continuously throughout the day rather than eat distinct meals. The pediatric dietitians confirmed this “grazing” pattern of feeding as a common way of eating among toddlers. This is potentially alarming based on those frequently-consumed snack items identified in the FITS study. This issue of eating snack foods often throughout the day for an eating occasion was identified by some focus group participants, as well as some dietitians; the type of foods the toddlers were consuming at the eating occasions was considered more important than the number of occasions. However, NutriSTEP® researchers decided that the frequency of eating occasions was the indicator of interest in regard to this topic. They identified that if toddlers were consuming unhealthy snack foods throughout the day, their intake of the various food groups would likely be low, and thus these individuals would score a higher risk based on other responses. Despite dietitian and parental feedback to clarify whether eating occasions referred to meals and/or snacks, researchers decided that defining these terms would be very difficult and cause further confusion.
6.1.6 Supplement Use

Parental input regarding supplement consumption in toddlerhood was inconsistent. Some felt that toddlers should not be given supplements, other than vitamin D in infancy, while others stated that supplementation was safe as products were developed specifically for this age group. Many parents also reported supplementing their toddlers because of “picky” eating habits. Despite this difference of opinion, parents did believe it was an important item to consider for the questionnaire. Based on literature findings that healthy toddlers should not require supplementation to achieve adequate intakes of most nutrients (Devaney, 2004), parental input stating that supplementation in toddlers without special nutritional needs is occurring, is of concern.

Although 31% of FITS participants were classified as supplement users, no significant contributions to nutritional adequacy were identified, and this group reported a higher prevalence of excess nutrient intakes (Briefel, 2006). This unnecessary supplementation, as well as the identified lack of related parental knowledge, presents an important item to be included on the NutriSTEP® questionnaire. Surprisingly some dietitians did not agree that supplement use was a very important topic to be considered for the questionnaire, as it was ranked as ‘slightly’ or ‘somewhat important’ by most. Although, others did mention that unnecessary supplementation is common and that use of supplements among otherwise healthy toddlers would likely indicate parental concerns and inappropriate feeding practices. Therefore, the research team decided that this was likely an important topic to include. Based on dietitian input, meal replacements were included as supplement examples.

6.2 Factors Affecting Food Intake
6.2.1 Food Security

Focus group participants thought that food insecurity may affect food intake of toddlers in some cases; however, many stated that it is more likely for parents to be unable to purchase certain foods, such as fresh and/or “healthier” foods, due to cost. They believed that parents would always be able to purchase food for their children, utilizing community programs and supports when necessary. Based on this, their suggestion was to ask parents about the difficult buying “healthy” foods based on cost, rather than food in general. These suggestions were understandable when considering the literature. For example, Kirkpatrick et al. (2008), found that while Canadian children classified as living in food insecure households reported similar nutrient intakes to those in food secure households, they consumed fewer servings of multiple food groups (Kirkpatrick, 2008). This decreased dietary variety may be explained by the difficulty to buy fresh, “healthy” foods, which was expressed as the real issue of food insecurity by parents in the focus groups. Researchers decided that a question relating to food security was necessary as food insecurity is an identified issue at the population level and our experts confirmed this importance. It was also agreed among the research team that risks associated with parental difficulty buying certain foods, which they described as “healthier” options, would be addressed through specific food group questions.

6.2.2 The Feeding Environment

Many parents commented that it was difficult to get toddlers to sit at the table during mealtimes. It has been reported that sitting during mealtimes/eating occasions may have a positive effect upon eating behaviours and nutrient intake of toddlers (Hoerr, 2006).
The influence of location upon toddlers' eating habits may be further explained by a possible relationship between TV viewing during mealtimes and decreased consumption of nutrient dense foods. Although many parents reported utilizing TV as a distraction during mealtimes in the focus groups, no related literature and/or recommendations for toddlers were found. However, one study with older children (average age 10 years) identified that those who viewed TV during meals, consumed fewer fruits, grain products, green and yellow vegetables, and other nutrient dense foods than those who did not watch TV during meals (Coon, 2001). Consumption of processed meats, as well as sodas and salty snacks, were also more common among those watching TV at mealtime. Based on the large number of parents in our focus groups describing the use of TV as a distraction during mealtimes, and the potential relationship between this and unhealthy feeding practices, NutriSTEP® researchers agreed that it was important to include a question on TV watching during eating occasions. Dietitians also identified that this was an important issue to be considered as an indicator of nutritional risk, although they suggested additional examples of amusing or distracting activities such as reading and/or playing with toys while eating which can affect feeding. Researchers agreed that these examples should be included in the question. Also, although many dietitians expressed that frequency and context of partaking in family meals (e.g., sitting at the table), also could influence food habits and food quality, researchers believed that these concepts were too complex and should be addressed in further assessment of higher risk toddlers.

6.2.3 The Feeding Relationship

Similar to findings from the FITS study, which indicated that 50% of toddlers were described as "picky eaters" by their parents (Carruth, 2004a), picky eating was a very
common concern among parents in the focus group sessions. Many stated that their
toddlers' picky eating habits, such as decreased dietary variety, or avoidance of feeding,
caused anxiety. Despite FITS findings, which indicate that there are no major differences
in nutrient intakes and consumption of major food groups between toddlers classified as
picky eaters and non-picky eaters (Carruth, 2004a), some focus group participants
reported offering supplements to ease their concerns if their toddlers were "picky eaters".
In addition to a noted decrease in variety of food consumed among children classified as
picky eaters, parents of picky eaters showed increased parental anxiety (Carruth, 2004a),
which may be of concern as it could result in use of inappropriate feeding practices, such
as the noted unnecessary supplementation.
Focus group participants mentioned other commonly-occurring inappropriate feeding
practices. Although some were aware of the importance of allowing toddlers to decide
how much to eat, many forced them to eat. This feedback from parents may explain
literature findings, which indicate that young children’s ability to self-regulate energy
intake often begins to diminish in toddlerhood (Fox, 2006b). In an early study with
preschoolers, it was identified that the social context of feeding can influence the cues
(satiety, hunger, rewards, portion sizes etc.) that young children rely upon to regulate
their energy intake (Birch, 1987b). In addition, the use of rewards to promote food
consumption, which was reported as a common technique used by parents in focus group
sessions, has been specifically found to negatively influence the development of young
mentioned pressuring techniques to promote eating, as well as restrictive feeding
practices; these have been identified as counterproductive, resulting in decreased
(pressuring) and increased (restricting) preference for the targeted foods respectively (Galloway 2006; Wright 2007).

On the other hand, some parents, noted that increasing exposure to a variety of foods, while allowing toddlers to decide how much to eat, assisted with prevention or diminishing of picky eating habits. This parental observation is supported by early studies of Birch et al., which identified that increasing toddlers' exposures to a variety of novel foods improved dietary variety (Birch 1982, Birch 1987a). These studies also suggested that five to 20 exposures could be necessary before a toddler’s preference for a novel food increases. From the discussions of our focus group parents, it is apparent that they are generally unaware of this fact, leading to inappropriate feeding practices as well as parental anxiety. FITS results indicate that toddlers are usually only offered a new food between three to five times (Carruth, 2004a). This lack of sufficient exposure may be contributing to parental classification of toddlers as picky eaters, and their associated decreased dietary variety.

Based on these focus group results as well as literature findings surrounding the feeding relationship, NutriSTEP® researchers decided that a single question addressing whether parents allowed toddlers to decide for themselves how much to eat would be most effective at identifying risk. Therefore questions regarding specific inappropriate feeding practices, such as offering food rewards, were deemed unnecessary. In addition, the research team decided against a question related to “picky eating” status, as it is very common in toddlerhood and would be difficult to operationally define. Our expert dietitians confirmed that these decisions were appropriate, as they emphasized the importance of a single question asking whether parents allowed their toddlers to decide
how much to eat, and they did not mention the addition of questions relating to specific feeding practices.

6.2.4 Other Factors to Consider

Although not identified in the literature review, some parents provided suggestions to consider for the questionnaire, which they believed encouraged development of healthy eating habits in toddlers. These included participation in social activities such as play groups, as these promote healthy role modeling by staff, other parents and/or peers. Also, many parents stated the importance of developing and following a daily routine, including regular sleep patterns, as they believed this was a necessity for toddlers to develop regular and healthy eating patterns. Dietitians also expressed that having a consistent feeding schedule in place often results in more positive feeding practices among toddlers. Although the research team agreed that both of these factors might indirectly influence toddler’s nutritional status, it was decided that these would be addressed upon further assessment of a high-risk toddler rather than during screening as they were not specific enough to nutrition risk.

6.3 Physical Activity and Sedentary Behaviour

Despite the increasing rates of overweight and obesity in childhood, research related to physical activity and sedentary behaviour in toddlers is limited. There are no Canadian recommendations relating to physical activity for toddlers; however, the National Association of Sport and Physical Activity (NASPA) recommend “all children from birth to age 5 should engage in daily physical activity that promotes movement, skillfulness and foundations of health-related fitness” (National Association of Sport and Physical Activity, 2011). In addition, they recommend that all toddlers should participate in at
least 30 minutes of structured physical activity per day, and 60 minutes of unstructured play.

Most parents commented that physical activity was important for toddlers; however, in contrast to the NASPA recommendations, many believed that at this age they are busy and moving constantly throughout the day, so it may not be appropriate to ask about structured physical activity. Parents suggested that to include a physical activity question for toddlers might be more appropriate, if the child needs encouragement to be physically active, as this would likely indicate more serious issues. Based on this parental feedback expressing that a measure of physical activity is not appropriate for toddler-aged children as well as the lack of research evidence, researchers agreed that this would not be included on the questionnaire. Some dietitians did suggest it may be beneficial to measure time spent participating in physical activities; however, most believed that a measure of sedentary behaviour would be sufficient. Therefore, the research team decided that this item was unnecessary.

Many parents, as well as dietitians, felt that time spent participating in sedentary activities was more important to consider than structured physical activity. Some dietitians noted a strong link between hours of TV viewing or screen time and physical inactivity. Parents reported that TV viewing was very common among toddlers, and some at this age also played video games and used computers. Despite AAP recommendations to limit TV “entertainment media” to less than two hours per day for children over two years of age, 41% of toddlers participating in the National Longitudinal Survey of Youth reported watching three or more hours of TV per day (Goodell, 2008). Parents did suggest that examples other than “entertainment media,” such as reading or colouring, be included
when referring to sedentary behaviours, as many parents may not consider these as sedentary behaviours. Dietitians did not suggest any other examples of sedentary behaviours, and NutriSTEP® researchers decided that these would not be added as it could cause parents to associate positive behaviours, although also sedentary, with negative behaviours which were recommended to be limited.

Lastly, it was also suggested that a question be considered for time spent daily in a car seat and/or stroller. Most agreed that this may be an issue if parents are busy driving other siblings to scheduled activities, or very busy throughout the day. However, no literature was identified to sedentary activities, including car seat/stroller use for extended periods of time. Despite the belief that this would likely be indicative of sedentary behaviour in toddlers, dietitians believed that this question would be challenging to ask as car seats especially are used for safety. NutriSTEP® researchers agreed that this question would be inappropriate to ask on the screening tool.

6.4 Growth and Development

6.4.1 Growth and Weight Status

Some parents believed that comfort with a child’s growth was more important to consider than the child’s weight. They explained that comfort or ‘perceived normalness’ is more important as, independent of weight, concerned parents may alter feeding practices to promote or restrict eating. Some parents noted that this concern often stems from comparison of their child with other children, and that even with a doctor’s indication that a toddler was growing well, parents are often still concerned. Similarly, dietitians also agreed that these questions addressing parental concern and perception were very important.
Many dietitians also identified that overweight and/or obese toddlers may not be classified as high risk based on these questions as their parents will not express this concern with their weight. This feedback is similar to findings from previous research indicating that parents are more concerned with their children weighing too little than being overweight (Laraway, 2010). Parents in the focus group sessions also identified this, as they expressed that they would not be as concerned if their toddler was overweight, as they felt that the toddler would likely grow "out of" or "in to" the excess weight. This lack of parental concern with excess weight is alarming as the WHO reported in 2009 that at least 20 million children less than 5 years of age are overweight worldwide (WHO, 2009), and CCHS data indicates that approximately 21% of Canadian children aged 2-5 are overweight or obese (Shields, 2006). Dietitians suggested that height and weight be recorded/measured in an attempt to classify overweight and/or obese toddlers appropriately; however, this level of assessment is not appropriate for a parental self-assessment, like NutriSTEP®. Many parents also stated that a question asking about a child’s actual weight status would be difficult to answer, as most parents are unaware of their child’s weight. They suggested that, if including a question asking parents to describe their toddler’s weight status, it should be preceded with “I think” to indicate that it is the parent’s perception. Researchers agreed with this suggestion based on experience with NutriSTEP®, as well as literature findings. Thus, based on these inputs, and the inability to measure heights and/or weights of toddlers for a screening questionnaire, only questions addressing parental perceptions of weight and growth were included.

6.4.2 Developmental and Physical Capabilities
Many parents expressed that choking, trouble swallowing and other developmental issues were not common among toddlers; however, they agreed that this would be an important issue to consider as it would likely affect food intake and nutritional status. Dietitians expressed that this was very important, and NutriSTEP® researchers agreed and included a question regarding these difficulties.

Some parents did identify that toddlers often spit out, gag, and/or choke, on certain foods due to texture. Based on this, it was suggested to consider an additional question asking about toddlers’ transition from pureed foods to solid foods, as some may have difficulty with new textures, making this transition difficult. FITS findings indicated that 99% of toddlers 19-24 months of age were consuming foods that required chewing; therefore, contrast to parental input from focus group sessions, it seems as though toddlers are transitioning from pureed foods appropriately (Carruth, 2004b). Based on these findings, the research team decided upon inclusion of a question asking whether toddlers are still consuming baby foods. Dietitian input confirmed that this was an important question, to address difficulties some toddler’s have when transitioning between textures. However, they recommended, and the research team agreed, that the term “baby foods” should be replaced with “pureed foods” as some commercial and/or homemade baby foods may be thicker and chunkier in texture, which is appropriate for younger toddlers.

Parents also suggested asking about whether some developmental milestones have been met, as delayed progression may hinder nutritional status. They recommended asking if children are self-feeding, which they noted will probably only be some of the time, and that most toddlers will likely use their hands as well as utensils at this age. Dietitians also ranked self-feeding as a very important question to consider for inclusion. FITS found
that by 19-24 months almost all (97%) toddlers were able to remove food from a spoon with minimal spilling and most (88%) were effectively feeding with a spoon (Carruth 2004b). Based on parental input, as well as confirmation from dietitians, and literature findings indicating that most toddlers are self-feeding, the research team decided upon the inclusion of a self-feeding question.

Also at this age, almost all toddlers (99%) were drinking from a “sippy” cup without assistance, while only 57% were drinking from a regular cup (no lid) without help (Carruth, 2004b). Although FITS data did not report the number of toddlers bottle-feeding, a recent literature review reported that approximately 75% of US children have not discontinued bottle-feeding at 12 months of age (Bonuck, 2010). Parents did suggest that asking if children were still drinking from a bottle or “sippy” cup was important, as they explained this transition is a difficult task for many. Literature, as well as input from dietitians, also confirmed this importance, as both stated that delayed progression to “sippy” cup, or regular cup use may have detrimental effects upon nutritional status in toddlers due to excess milk consumption (Bonuck, 2010). Based on these findings NutriSTEP® researchers agreed that a question focused on bottle feeding was necessary. Researchers refrained from including the use of “sippy” cups in this question due to the lack of literature available, as well as the confusion that may be created by referring to two different drinking vessels in one question. Dietitians confirmed that keeping this question specific to bottle use would be much simpler for parents.

Parents also identified consumption of bedtime bottles, as well as soother usage, as potential items to consider for the NutriSTEP® questionnaire; however, these concerns were dental related rather than nutritional. Although some dietitians also mentioned the
importance of asking about bedtime bottles, NutriSTEP® researchers believed that this was not a nutritional risk indicator and thus a question was not included.

6.5 Comparison to Other Pediatric Screening Tools

Findings from a literature review of 44 nutrition risk screening and assessment tools indicated that development of these tools is often based upon insufficient research and inappropriate methodology (Jones, 2002). In regard to item identification, most researchers use the initial items identified through various means, as those selected for the tool, with no refinement around meaning of concept, importance to the construct of interest or terminology used. In addition, many do not provide any justification for the chosen content. Among those providing justification, most simply referred to previously published work or clinical experience. Researchers conducting the review emphasized the importance of providing evidence to justify that each item considered for inclusion as part of a tool may be indicative of nutritional risk. It was concluded that “sound design and analysis principles” are necessary to ensure appropriate and useful tools are being developed (Jones, 2002, p.60).

In a 2004 review of children’s health care measures, it was identified that many of the measures being used in pediatrics are not designed specifically for use among children, and measures specific to the various pediatric developmental stages were more limited (Beal et al., 2004). This is an issue as there are many unique needs of children that should be considered in the development of a health measure (Beal et. al, 2004).

As described previously, the PEACH survey is a nutrition screening tool developed for children with special health care needs (Campbell, Kramish & Kelsey, 1994). Details of survey development are limited, including a statement explaining that survey questions
were selected and adapted, and no methodological details were provided. Reliability was not tested, and a panel of six pediatric experts assessed content/face validity. In addition, scoring and risk cut-offs were not identified statistically. Lastly, all phases of development and validation studies were conducted in a single location (central North Carolina); therefore, this tool may not be appropriate for use in diverse populations.

Nipissing Developmental Screens, a group of thirteen age-specific screening tools, although not assessing nutrition risk, are commonly used across North America to screen for developmental delays in young children one month to six years of age. Despite their common usage, the question selection process is very briefly explained with a statement that questions were selected from various standardized and non-standardized measures by a multi-disciplinary committee (Dahinten & Ford, 2004). Literature searching revealed no further reports regarding item selection and refinement.

In addition, Nipissing Screens were utilized without validity or reliability testing, from the initial development in the mid 1990’s until a validation study of the 12 month version in conjunction with the provincial Healthy Babies Healthy Children (HBHC) program in 2001-2002 (Dahinten & Ford, 2004). Initially, a single ‘no’ response on the Nipissing Screen would indicate a need for further assessment/referral. However, the validation study conducted with 238 participants tested concurrent validity by comparing results from two different scoring options for the Nipissing screen, with those from a single commonly used, valid tool, measuring early childhood development in clinical settings and for research, called the Ages and Stages Questionnaire (ASQ) (Nagy, Ryan, & Robinson, 2002). It was identified that the scoring option where two ‘no’ responses were necessary to indicate the need for further follow-up, yielded higher agreeability with the
valid ASQ. This indicates that conducting validity testing prior to use of the questionnaire is very important.

Overall, nutrition screening tools are often developed based on insufficient methodology, and although there are not many pediatric specific tools available, it is likely, as shown with the PEACH survey (Campbell et al., 1994), and the Nipissing Screens (Dahinten & Ford, 2004) that these are no exception. The methodology implemented in the initial phase of Toddler NutriSTEP development is much more extensive than that involved in the development of most nutrition screening tools.

6.6 Summary

In summary, these findings clearly provide support for Streiner & Norman’s (2008) recommendation that gathering perceptions from potential questionnaire users, as well as professionals, is beneficial when determining items to be included on a health measurement scale. The current findings indicate that, although parents and pediatric dietitians often agreed on the importance of nutrition risk indicators, parents were able to identify potential items based on lived experiences with their toddlers, while dietitians provided valuable inputs on how parents would likely interpret items, and concerns based on exposures from practice. The lack of scientific literature pertinent to toddler nutritional intakes and behaviours, as well as parental feeding practices, further emphasizes the need to include multiple sources of input when attempting to identify all possible items for a screening questionnaire. Many additional risk indicators, not identified through the literature, were considered for inclusion based on parental and/or expert suggestions.

6.7 Strengths of the Research
Based on results from Jones’ literature review on the methodological limitations of many nutritional screening tools (Jones, 2002), the development of the Toddler NutriSTEP®, even in its early stages, has many methodological strengths over tools previously developed and currently in use. Following a multi-method approach, input was incorporated from various sources, including representation from various regions throughout Ontario, as well as multiple provinces across Canada. Furthermore, dietitians with pediatric experience from various backgrounds, including clinical and public health, were included. Also, the use of a reliable and valid preschooler nutrition risk screening tool (Randall Simpson, 2007) as a starting point is also a strength of the current research, as these questions have been tested in a similar population and used extensively since their creation demonstrating practice-community acceptance. The NutriSTEP® research team’s extensive experience with nutrition risk screening and questionnaire development also is a strong point.

Specific to the focus group methodology, moderators participated in training prior to group conduction, and transcription was conducted by a single researcher who was present in all groups as a note taker. Moderators were part of the NutriSTEP® team as it was believed the experience and knowledge of screening and NutriSTEP® was needed more so than professional moderation for these focus groups. In addition, each transcript was checked for consistency by another member of the research team. Encompassing a dynamic interview process allowed moderators to ensure all topics were covered substantially throughout the entire process. Furthermore, making adjustments to the interview guide between focus group sessions allowed all members of the research team
to provide input continuously throughout the process to ensure quality data collection, meeting the research objectives.

Conducting a teleconference discussion with dietitians to clarify their survey responses and reach consensus is also a strength of the current research. This indicates that the research team did not make decisions based on their own interpretation of the experts’ responses, instead; they gathered further clarification when necessary. In addition, response rates from dietitians were high for both the online survey, as well as the teleconference discussion.

Finally, when decisions were made to change wording and include or exclude questions an iterative group process was used by the team. They considered their knowledge of the screening process and the capacity to ask clear, direct questions of parents, as well as the literature, expert opinion and parental concerns and behaviours identified in the focus groups.

6.8 Limitations

Despite many strengths as noted above, limitations of the current research do exist. The recruitment of parents from OEYCs, as described previously, likely contributed to the high income and education level of participants, as well as the high number of married participants. Parents attend these centers during day time hours, during which times many individuals would be attending work, likely indicating many of them do not have to work, or work shifts. In addition, parents have to seek out programs and services such as the OEYC, which may indicate that they are educated regarding the benefits and importance of these programs for their children. In addition, although focus groups were conducted in ethnically diverse cities, the majority of participants were Caucasian.
In general, the parents participating in the focus groups were not representative of the entire population. In order to achieve this, recruitment methods to theoretically sample for males and various ethnicities, income and education levels, would have had to be employed.

Dietitians were recruited purposively based on previous participation in NutriSTEP® research, as well as experience in pediatrics. Although previous participation, unlike pediatric experience, was not necessary for participation, these individuals were more likely to participate based on awareness of the research.

The online survey created through Survey Monkey also presented some limitations. Despite specifying during creation that respondents only be allowed to select a single option when rating items in relation to each other within a single category, this option was still available. Responses from three participants had to be disregarded as a result. In addition, coordination of the teleconference discussion with participants across Canada was difficult due to time zone differences, as well as scheduling conflicts among a large group. As a result, many dietitians were unable to participate on the phone call, and provided written feedback instead. Also with regard to this follow-up discussion, changes to the questionnaire items were made based on research team discussion following the group; however, transcripts from the discussion were not recorded. This caused some difficulty when attempting to provide rationale for research team decisions.

Overall, despite minor limitations, the initial phases of the Toddler NutriSTEP® development present an improvement from those nutrition screening tools considered in Jones’ literature review.
6.9 Next Steps

The current research has successfully completed the initial steps in the development of the Toddler NutriSTEP® questionnaire. However, there are still many necessary steps prior to completion of the screening tool. Identifying response options for each question, as well as assigning specific risk scores to these options must be completed. Following this, further input will be gathered on wording and understanding through key intercept interviews with parents. Test-retest reliability, as well as validity testing, will then be conducted on the tool following methodology very similar to that reported in the preschooler NutriSTEP® validation paper (Randall Simpson, 2007). Descriptions of the methodology, as well as results from these subsequent phases will be made available to those utilizing the tool. This will ensure that the tool is used correctly, in populations for which it has been created and validated.
7.0 Conclusions

In summary, similar toddler nutritional risk concerns were identified in the literature, by parents, and by pediatric nutrition experts. It is clear that there is a lack of literature relating to food and nutrient intake, as well as feeding behaviours of toddler aged children, and therefore, including parents of toddler and pediatric nutrition experts was necessary to develop an inclusive tool. Relying solely upon literature to identify risk factors to be included on the nutrition risk screening tool would have resulted in the development of an unreliable or invalid tool. Also, simply modifying aspects of NutriSTEP® for this age group (e.g., amount of TV watching) based on recommendations would have also been insufficient; specifically we would have missed out on asking questions on physical development and capacity which were identified to be a new construct for toddler risk. Furthermore, parents and pediatric experts also provided unique, and valuable, suggestions, which assisted NutriSTEP® researchers with item determination for the Toddler NutriSTEP® questionnaire.
8.0 References


National Association for Sport and Physical Education. (2011). *Active start. A statement of physical activity guidelines for children from birth to age 5* (2nd ed.).


reliability of a parent-administered questionnaire assessing nutrition risk of preschoolers. *EJCN, 62*(6), 770-780.


9.0 Appendices

Appendix A. Preschooler NutriSTEP®
Nutrition Screening Tool for Every Preschooler

Instructions

Below are questions about your preschool child's (3 to 5 year old) eating and other habits.

- Think about your child’s every day habits when answering. Check (✓) only one answer for each question.
- There is a number from 0 to 4 beside each answer. This number is a score for that question.
  At the bottom of each page is a box for the score for the page. For each page, add up the scores for each question.
- At the end of the questionnaire, you will add the page scores to get the total score.

1. My child usually eats grain products:
   Examples are bread, bagel, bun, cereal, pasta, rice, roti and tortillas.
   ✓ 0  More than 5 times a day
   1 1 4 to 5 times a day
   2 2 3 to 3 times a day
   3 3 2 times a day
   4 4 Less than 2 times a day

2. My child usually has milk products:
   Examples are white or chocolate milk, cheese, yogurt, milk puddings or milk substitutes, such as fortified soy beverages.
   ✓ 0  More than 3 times a day
   1 1 3 times a day
   2 2 2 times a day
   3 3 Once a day or less

3. My child usually eats fruit:
   ✓ 0  More than 3 times a day
   1 1 3 times a day
   2 2 2 times a day
   3 3 Once a day
   4 4 Not at all

Total Score for Page 1
4. My child usually eats vegetables:
   - □ More than 2 times a day
   - □ 2 times a day
   - □ Once a day
   - □ Not at all

5. My child usually eats meat, fish, poultry or alternatives:
   Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils.
   - □ More than 2 times a day
   - □ 2 times a day
   - □ Once a day
   - □ A few times a week
   - □ Not at all

6. My child usually eats “fast food”:
   - □ 4 or more times a week
   - □ 2 to 3 times a week
   - □ Once a week
   - □ A few times a month
   - □ Once a month or less

7. I have difficulty buying food to feed my child because food is expensive:
   - □ Most of the time
   - □ Sometimes
   - □ Rarely
   - □ Never

8. My child has problems chewing, swallowing, gagging or choking when eating:
   - □ Most of the time
   - □ Sometimes
   - □ Rarely
   - □ Never

9. My child is not hungry at mealtimes because he/she drinks all day:
   - □ Most of the time
   - □ Sometimes
   - □ Rarely
   - □ Never

□ Total Score for Page 2
10. My child usually eats:
   □ Less than 2 times a day
   □ 2 times a day
   □ 3 to 4 times a day
   □ 5 times a day
   □ More than 5 times a day

11. I let my child decide how much to eat:
   □ Always
   □ Most of the time
   □ Sometimes
   □ Rarely
   □ Never

12. My child eats meals while watching TV:
   □ Always
   □ Most of the time
   □ Sometimes
   □ Rarely
   □ Never

13. My child usually takes supplements:
    Examples are multivitamins, iron drops, cod liver oil.
    □ Always
    □ Most of the time
    □ Sometimes
    □ Rarely
    □ Never

14. My child:
    □ Needs more physical activity
    □ Gets enough physical activity

15. My child usually watches TV, uses the computer, and plays video games:
    □ 5 or more hours a day
    □ 4 hours a day
    □ 3 hours a day
    □ 2 hours a day
    □ 1 hour or less a day

□ Total Score for Page 3
16. I am comfortable with how my child is growing:

☐ Yes
☐ No

17. My child:

☐ Should weigh more
☐ Is about the right weight
☐ Should weigh less

☐ Total Score for Page 4

To get a total score, add the scores for each page.

Score for Page 1
+ Score for Page 2
+ Score for Page 3
+ Score for Page 4

= Total Score

What does your NutriSTEP® score mean?

If the total score is 20 or less:
Your child’s eating and activity habits are good. There may be things that you want to work on; check out the educational material provided for tips and more information.

If the total score is 21 to 25:
Your child’s eating and activity habits can be improved by making some small changes. Check out the educational material provided or contact your local public health department for tips and more information.

If the total score is 26 and greater:
Your child’s eating and activity habits can be improved by making some changes. For suggestions, talk to a health professional such as a registered dietitian, your family doctor or paediatrician or contact your local public health department for more information.

For more information on nutrition and healthy eating, visit EatRight Ontario at: www.ontario.ca/eatright. Ontario residents can speak to a Registered Dietitian by calling the EatRight Ontario toll-free telephone information service at 1-877-510-5102, Monday to Friday.

Printing of this resource has been paid for by the Government of Ontario. March 2009.

Copyright (c) 1998-2008. Sudbury & District Health Unit, Janis Randall Simpson and Heather Keller. NutriSTEP® is the copyright of the Sudbury & District Health Unit, Janis Randall Simpson and Heather Keller and must not adapted, modified or translated. The Sudbury & District Health Unit is the owner of trademarks used throughout. For more information, visit: www.nutistep.ca.
Appendix B. University of Guelph Ethics Application
University of Guelph Research Ethics Board (REB)

FACULTY AND GRADUATE
Application to Involve Human Participants in Research

Please refer to the University of Guelph Research Ethics Guidelines, found at http://www.uoguelph.ca/research/forms_policies_procedures/human_participants.shtml before completing and submitting this application. If you have questions about this form, please contact the Research Ethics Coordinator, Sandra Auld at ext. 56606, or reb@uoguelph.ca.

Date: (yyyy-mm-dd) (For OR use only) Protocol#: 

SECTION A – GENERAL INFORMATION

1. **Title of the Research Project**: Development of a Toddler NutriSTEP: Content Validation

2. **Investigator Information**

<table>
<thead>
<tr>
<th>Name &amp; position</th>
<th>Dept./Address</th>
<th>Phone No.</th>
<th>E-Mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty with Principal Responsibility*: Janis Randall Simpson</td>
<td>FRAN</td>
<td>53843</td>
<td><a href="mailto:rjanis@uoguelph.ca">rjanis@uoguelph.ca</a></td>
</tr>
<tr>
<td>Faculty: Co-Investigator(s)</td>
<td>Heather Keller</td>
<td>FRAN</td>
<td>52544</td>
</tr>
<tr>
<td>Student: Investigator(s)</td>
<td>Jillian Gumbley, Nicole Holland</td>
<td>FRAN, HHNS</td>
<td><a href="mailto:jgumbley@uoguelph.ca">jgumbley@uoguelph.ca</a>, <a href="mailto:nholla01@uoguelph.ca">nholla01@uoguelph.ca</a></td>
</tr>
<tr>
<td>Other: Investigator(s)</td>
<td>Joanne Beyers</td>
<td>Sudbury &amp; District Health Unit</td>
<td>705 522-9200</td>
</tr>
</tbody>
</table>

* must be advisor of any student investigators.

3. **Proposed Date** a) of commencement: May 2010 b) of completion: 2010

Note: The commencement date should be the date the researcher expects to actually begin interacting with human participants (including recruitment). The completion date should be the date that the researcher expects that interaction with human participants, including any feedback or follow-up, will be complete.

4. **Indicate the location(s) where the research will be conducted:**

Send this form and all accompanying material by email, as attachments, to reb@uoguelph.ca. One hard copy of the signed signature page should be forwarded to the Research Ethics Coordinator, Office of Research, University of Guelph, 437 University Centre, Guelph, ON, N1G 2W1.

If you want to change a previously approved protocol, please complete the “Change Request” form, available at http://www.uoguelph.ca/research/forms_policies_procedures/human_participants.shtml.
5. **Other Research Ethics Board Approval**

   a) Is this a multi-centred study? ☐ ☑
   b) Has any other institutional Ethics Board approved this project? ☐ ☑
   c) If **Yes**, please provide the following information:

      Title of the project approved elsewhere:
      Name of the Other Institution:
      Name of the Other Board:
      Date of the Decision:
      A contact name and phone number for the other Board:
      OR
      A copy of the clearance certificate / approval

   d) Will any other Research Ethics Board be asked for approval? ☐ ☑

   If **Yes**, please specify:

6. **Level of the Project**

   Faculty Research ☑
   PhD Thesis ☐
   Masters Thesis ☑
   Honours Thesis ☐
   Class Project ☐
   Internship ☐
   Practicum ☐
   Other (please specify): MSc Coursework Project

7. **Funding of the Project**

   a) Is this project currently funded? ☑ ☐
   b) Period of Funding: From Jan 2010 To: June 2012
   b) Agency or Sponsor (funded or applied for)
      CIHR: CIHR Operating Grant
      NSERC:
      SSHRC:
      Other (please specify):

      Note: **Please specify the complete title of the funding source.** For example, “NSERC Discovery Grant”.

**NOTE:** If the funding source changes, or if a previously unfunded project receives funding, you must submit a Change Form to the Research Ethics Coordinator.

8. **Conflict of Interest**
a) Will the researcher(s), members of the research team, and/or their partners or immediate family members:

i) Receive any personal benefits (for example a financial benefit such as remuneration, intellectual property rights, rights of employment, consultancies, board membership, share ownership, stock options etc.) as a result of or connected to this study? Yes ☑ No

ii) If Yes, please describe the benefits below. (Do not include conference and travel expense coverage, possible academic promotion, or other benefits which are integral to the general conduct of research.)

Development of a Toddler NutriSTEP will result in copyright of the questionnaire. Further, a new trademark for the Toddler NutriSTEP questionnaire will result. The faculty members involved already own copyright on the current NutriSTEP (along with Sudbury & District Health Unit). The trademarks for NutriSTEP are owned by Sudbury & District Health Unit.

b) Describe any restrictions regarding access to or disclosure of information (during or at the end of the study) that the sponsor has placed on the investigator(s).

None

c) Discuss the possibility of commercialization of the research findings.

The Toddler NutriSTEP will be available by license through the Business Development Office at the University of Guelph. This is the arrangement that we currently have for NutriSTEP. The current NutriSTEP is free for anyone in the Province of Ontario with charges for those outside of the province (this was based on the fact that a lot of provincial funding went into the development of the current NutriSTEP). It is likely that there will a charge for everyone for the new Toddler NutriSTEP. Proceeds from the sale of licenses is directed into a research account at the University of Guelph.

SECTION B – SUMMARY OF THE PROPOSED RESEARCH

9. Rationale

Describe the purpose and background rationale for the proposed project, as well as the hypotheses/is/research questions to be examined.

The NutriSTEP® program is an excellent and innovative program that began over 10 years ago and has resulted in the development of a valid and reliable nutrition risk screening questionnaire for preschoolers. Nutrition is vital for support of optimal growth and development. Young children, including toddlers, with nutritional problems are at risk for growth, behavioural and developmental problems, including overweight and obesity, among other issues. NutriSTEP® is now a provincially recognized program and falls under the Ontario Ministry of Health Promotion and is supported by the Nutrition Resource Centre. In addition to the NutriSTEP® questionnaire, considerable knowledge translation and dissemination has taken place including: an implementation toolkit; availability of the NutriSTEP® questionnaire through a university dissemination portal (www.Flintbox.com); a website (www.nutristep.ca); parent education information; copyright and trademark registration, etc. Pediatric Nutrition experts across Canada have expressed a need for a Toddler version of NutriSTEP® as the current version of NutriSTEP® is for preschoolers. The proposed research will allow the NutriSTEP® research
team to adapt the current questionnaire, designed for preschoolers (ages 3-5 years) for toddlers (ages 18 – 30 months). Successful development of a Toddler NutriSTEP® will mark another step in the maintenance and expansion of the NutriSTEP® nutrition risk screening program in order to improve nutrition for young children in Canada.

The overall goal of the NutriSTEP® program is to improve the nutritional health of all Canadian children, through the ethical use of valid and reliable screening tools; this will fulfill a clearly identified gap in the obesity research field. There is no valid and reliable toddler nutrition screening tool available in North America; the current NutriSTEP® is for preschoolers (3-5 years of age). Provincial/regional programs that have expressed a need for Toddler NutriSTEP® include New Brunswick, Stratford, the Hospital for Sick Children, and Calgary. There are numerous reports of the growing “obesity epidemic” in all segments of the Canadian population including children as young as two years of age. However, there is no national, population-level information on weight and nutritional status of toddlers or on the extent and nature of potential weight and nutritional problems amongst this target group. The current proposal is to develop/adapt the current NutriSTEP® to make it suitable for screening toddlers (18 – 36 months).

Expansion of the NutriSTEP® program of research to toddlers will increase understanding of toddlers’ weight issues in Canada through surveillance of prevalence, risk factors and co-morbidities. The current NutriSTEP® tool assesses the construct of parents’ perceptions of their preschool children’s nutritional risk. Ten years of development have produced a validated and reliable nutrition risk screening questionnaire for preschoolers with four attributes and contributing factors that include: a) physical growth (including overweight/obesity/underweight); b) risk factors influencing eating behaviour (eating capabilities; psychosocial and environmental influences; present concerns and perceptions of child’s health; food security; c) eating and nutritional intake; and, d) physical activity/sedentary behaviour. The proposed research will investigate the modification/addition of questions unique to toddlers such as weaning. A simple screening questionnaire and accompanying parent nutrition education material will provide parents with insight into nutrition issues facing children in this age group and the supports and resources available to them. The NutriSTEP® Program will also build capacity and translate knowledge about preschool nutrition and weight issues across Canada.

10. **Methodology**

Describe sequentially, and in detail, all procedures in which the research participants will be involved (e.g., paper and pencil tasks, interviews, surveys, questionnaires, physical assessments, physiological tests, time requirements etc.)

*Note: Attach a copy of all questionnaire(s), interview guides or other test instruments. These should be on University of Guelph letterhead if they are intended for public dispersal.*

**Focus Groups**
Parents of preschoolers (ages 3-5 years) will be asked to do the following:

- Read and sign an Information Letter (Appendix A)
- Read and sign an informed consent form (Appendix B)
- Fill out a questionnaire that includes information on marital status, education level, language, etc. (Appendix C)
- Fill out the current NutriSTEP™ questionnaire (Appendix D)
11. **Experience**

What is your experience with this kind of research?

We have extensive experience in the development of these sorts of questionnaires. We developed NutriSTEP that is now a provincial program, under the auspices of the Ontario Public Health Association. All of the investigators (JRS, HK, JB, LR) have extensive experience in the development of screening tools. All have been involved with the development of NutriSTEP™ over the past 8 years; to date, close to 2000 parents across Canada have been taken part in the development of NutriSTEP™.

12. **Participants**

Describe the number of participants and important characteristics (such as age, gender, location, affiliation, etc.)

Parents (n = 56 - 64) of toddlers from ethnically and geographically diverse backgrounds will be recruited using strategies that we have employed previously with success. The sample size is based on our previous experience. Participants will be parents of healthy (no major diseases that would affect nutrition such as digestive disorders, children who are developmentally challenged etc.) toddlers (18 – 35 months of age). Participants can be of either gender. Participants must have lived in Canada for at least 5 years, must speak English, and must read English at the Grade 6 level.

13. **Recruitment**

a) Describe how and from what sources the participants will be recruited, including any relationship between the investigator(s) and participant(s) (e.g., instructor-student; manager-employee).

*Note: Attach a copy of any poster(s), advertisement(s) or letter(s) to be used for recruitment.*

Participants will be recruited by means of advertisements in newspapers, as well as flyers posted in permitted locations. Participants will be recruited from locations such as the University of Guelph Child Care and Learning Centre. In addition, participants will be recruited from programs such as the Canada Prenatal Nutrition program (federal program), Best Start Hubs (program of the Province of Ontario), and Healthy Babies Healthy Children (federal program) through public health units in locations to include: City of Hamilton Public Health; Perth District Health Unit (Stratford); Thunder Bay District Health Unit; Sudbury & District Health Unit; York Region Public Health; other public health units in Ontario. Further, advertisements will
be placed in local community grocery stores and childcare centers. In all cases, permission will be obtained from programs/locations prior to posting posters/letters, etc. Copies of the following recruitment documents are attached: poster (Appendix F); newspaper advertisement (Appendix G); letter to potential participants (Appendix H).

b) How and where will you contact these participants?

The advertisements mentioned above will provide contact information (phone number/e-mail address) for those who are interested in participating. A research assistant or contacts in the public health system will be available to communicate with potential participants in order to schedule the focus groups.

c) Time required of participants: 2 hour(s) on 1 occasion(s).

Participants will be asked to participate in one focus group (focus group to last for about one hour). Additional time is for travel, etc.

d) Are participants proficient in the language in which the survey is being conducted? ☒

If not, is translation available?

Participants must speak English at the Grade 6 level in order to participate in the study.

14. Compensation

a) Will participants receive compensation for participation? Yes

   i) Financial

      ☐ ☒

   ii) Non-financial

      ☒ ☐

b) If Yes to either i) or ii) above, please provide details.

Parents will receive the following: NutriSTEP measuring cup; toddler nutrition educational booklet (see Appendix I); contacts for nutrition and health resources in the community. Further, a health snack will be served at each focus group.

c) If participants choose to withdraw, how will you deal with compensation?

Participants will be able to keep the incentives even if they withdraw from the study.
SECTION C – DESCRIPTION OF THE RISKS AND BENEFITS OF THE PROPOSED RESEARCH

15. Possible Risks

a) Indicate if the participants might experience any of the following risks:  
   Yes  
   No  
   
   i) Physical risk (including any bodily contact or administration of any substance)?  
      ☐  ☒
   
   ii) Psychological risks (including feeling demeaned, embarrassed worried or upset)?  
       ☒  ☐
   
   iii) Social risks (including possible loss of status, privacy and/or reputation)?  
        ☐  ☒
   
   iv) Is there any deception involved?  
       ☐  ☒
   
   v) Are any possible risks to participants greater than those the participants might encounter in their everyday life?  
      ☐  ☒

b) If you answered Yes to any of points i) through v) above, please explain the risk.

The risk involved with taking part in this project is low. Filling out and scoring NutriSTEP™ and discussing toddler nutrition issues with other parents may cause concerns about child feeding and nutritional health.

   c) Describe how the risks will be managed (including an explanation as to why alternative approaches could not be used).

   Experienced nutrition professionals (Registered Dietitians) will be in attendance at all focus groups in order to answer questions from any concerned parents/caregivers.

16. Possible Benefits

   Discuss any potential direct benefits to the participants from their involvement in the project. Comment on the (potential) benefits to the scientific community/ society that would justify involvement of participants in this study.

   Direct benefits to parents include receipt of nutrition education information for toddlers; in the past, participants in various NutriSTEP studies have very much appreciated these resources that were developed specifically with NutriSTEP in mind. The overall benefit of this phase of the Toddler NutriSTEP™ project is to develop a nutrition screening tool for toddlers available for the first time in Canada.
SECTION D – THE INFORMED CONSENT PROCESS

17. The Consent Process

Describe the process that the investigator(s) will be using to obtain informed consent, including a description of who will be obtaining the informed consent. If there will be no written consent form, explain why.

Participants will be contacted about their willingness to participate in a focus group by a research assistant. At the focus group, informed consent will be obtained by a trained research assistant (one of the students involved in this project).

For information about the required elements in the letter of information and the consent form, please refer to “Instructions for the Preparing Information and Consent Letters” and the sample consent form available at http://www.uoguelph.ca/research/forms_policies_procedures/human_participants.shtml.

*Note: Attach a copy of the Letter of Information (if applicable), the Consent Form (if applicable), the content of any telephone script (if applicable) and any other material which will be used in the informed consent process. If the document will be made public, please ensure that it is on University of Guelph letterhead.*

Please see Appendices A & B.

a) Will the information provided to the participants be complete and accurate? Yes ☒ No ☐

If no, please describe the nature and extent of the deception involved. Include how and when the deception will be revealed, and describe the specialized training of the person who will administer this feedback. It is recommended that participants have the opportunity to sign a second consent form, following debriefing when the deception is revealed, to ensure a fully informed consent.

*Note: Attach a copy of the debriefing feedback and, if necessary, a copy of the second consent form on University of Guelph letterhead.*

n/a

18. Consent by an authorized party

If the participants are minors or for other reasons are not competent to consent, describe the proposed alternate source of consent, including any permission / information letter to be provided to the person(s) providing the alternate consent.

The parents will be completing the NutriSTEP™ questionnaire about their children and the parents will be providing consent to complete the questionnaire about their children.

19. Alternatives to prior individual consent
If obtaining individual participant consent prior to starting the research project is not appropriate for this research, please explain and provide details for a proposed alternative consent process.

n/a

20. **Participant feedback**

Explain what feedback/information will be provided to the participants after participation in the project. (For example, a more complete description of the purpose of the research, or access to the results of the research).

*Note: Please provide a copy of the written information, if applicable.*

As this study is to determine content validity, with the results contributing to draft Toddler NutriSTEP questions, there will NOT be feedback given to participants of the results of this part of the development of the Toddler NutriSTEP. However, some feedback will be provided within the focus group itself, should parents so wish.

21. **Participant withdrawal**

a) Describe how the participants will be informed of their right to withdraw from the project. Outline the procedures that will be followed to allow the participants to exercise this right.

Parents will be informed of their right to withdraw from the project at anytime both in writing within the consent form and verbally at the focus group. In addition, they will have the option to have their comments removed from the transcripts. They can do so by contacting the researchers by e-mail, phone of FAX (numbers provided in the information letter).

b) Indicate what will be done with the participant’s data and any consequences for the participant of withdrawing from the study.

If participants wish to withdraw, they can choose to either leave or have their data deleted from the focus group transcripts. There are no consequences for withdrawal.

c) If the participants will not have the right to withdraw from the project, please explain.

n/a

**SECTION E – CONFIDENTIALITY**

22. **Ensuring confidentiality**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Will all participants be anonymous?</td>
<td>☐</td>
<td>☒</td>
</tr>
<tr>
<td>b) Will all data be treated as confidential?</td>
<td>☒</td>
<td>☐</td>
</tr>
</tbody>
</table>

*Please note the difference: Participants’ identity/data will be confidential if an assigned ID code or number is used, but it will not be anonymous. Anonymous data cannot be traced back to an individual participant.*
c) Describe the procedures to be used to ensure anonymity of participants and/or confidentiality of data both during the conduct of the research and in the release of its findings.

Participants in the focus groups with be neither anonymous nor will their participation be confidential within the focus group. However, any comments made will be confidential within the group and among the researchers.

d) Explain how written records, video/audio tapes and questionnaires will be secured, and provide details of their final disposal or storage.

Transcripts of the focus groups and quantitative data from the demographic and NutriSTEP questionnaires will be secured in a locked office and on a password protected computer. All records will be held for a period of 7 years and then will be destroyed by shredding or by the deletion of computer files.

e) If participant anonymity or confidentiality is not appropriate to this research project, explain, providing details of how all participants will be advised of the fact that data will not be anonymous or confidential.

Focus group members will be reminded that the identity of fellow focus group members and topics discussed within the groups should not be discussed outside of the group.

SECTION F – MONITORING ONGOING RESEARCH

23. Annual Review and Adverse Events

a) Minimum protocol review requires the completion of a “Renewal/Completed Status Report” at least annually. Indicate whether any additional monitoring or review would be appropriate for this project.

Note: It is the investigator’s responsibility to notify the REB using the “Renewal/Completed Status Report” when the project is completed, or if it is cancelled. The form is available at http://www.uoguelph.ca/research/forms_policies_procedures/human_participants.shtml.

No additional monitoring is deemed to be required.

b) Adverse events (unanticipated negative consequences or results affecting participants) must be reported to the Research Ethics Board and the Research Ethics Coordinator as soon as possible.

24. Additional Information

(Use an additional page if more space is required to complete any sections of the form, or if there is any other information relevant to the project that you wish to provide to the Research Ethics Board.)

This project is a continuation of the NutriSTEP™ project that has been ongoing for several years and for
which previous REB approval has been granted.
SECTION G – SIGNATURES

Responsible Faculty Assurance:

I, __ Janis Randall Simpson __________________________ [PLEASE PRINT] have the ultimate responsibility for the conduct of the study described in this application including my responsibilities as an advisor to any students involved in this project. I have read and am responsible for the content of this application. If any changes are made in the above arrangements of procedures, or adverse events are observed, I will bring these to the attention of the Research Ethics Coordinator.

______________
Signature

(yyyy-mm-dd)
Date
Appendix C. Focus Group Interview Guide
Focus Group Interview Guide

Introduction

Explanation

Good morning/afternoon/evening. My name is _______ and this is __________.

Thank you for coming.
A focus group is a relaxed discussion.....

Present the purpose

We are here today to discuss possible changes to the current NutriSTEP questionnaire in order to make it suitable for toddlers (ages 18 – 35 months) instead of preschoolers (ages 3-5 years).

The purpose is to get your ideas and feelings. I am not here to share information, or to give you my opinions. Your thoughts and ideas are what counts. There are no right or wrong answers. You can disagree with each other, and you can change or add to your comments as you wish. I would like you to feel comfortable saying what you really think and how you really feel.

Participant introduction & Rapport building

Now, let's start by sharing our names. As well, I want each of you to think of a food and an activity that you like. We're going to go around the room so you can share your choices.

Discuss procedure

First of all, I would like to ask you to fill in the following forms: the consent form and the demographic form and we will pick them up. Each of you also has a copy of the current NutriSTEP questionnaire and a form that puts the NutriSTEP question items into nutrition risk components.

_____ (notetaker) will be taking notes and tape recording the discussion so that I do not miss anything you have to say. As you know everything is confidential. Our written report will not identify names and information will only be shared within the research team. We ask that none of you here today repeat any information discussed, after the focus group. We hope that what we say today “stays in this room”.

I want this to be a group discussion, so feel free to respond to me and to other members in the group without waiting to be called on. The tape recorder is in the middle of the table. Please speak up as loudly as you can so we do not miss what you have to say. However, I would appreciate it if only one person talks at a time. It’s
best if one person speaks at a time, otherwise the tape will get garbled and the Assistant will have trouble note-taking.
The discussion will last approximately one hour. There is a lot that I want to discuss, so at times I may move us along a bit.

Next, I would like you to look at the NutriSTEP questionnaire. Even though the questionnaire is for preschoolers, instead of for toddlers, you are welcome to fill it out to get an idea of the types of questions, responses and how they are scored.

Next, we will discuss the questions in each of the nutrition risk components as shown on the handout.

**Question#1**

Let's start our discussion by looking at the nutrition risk component for Food and Nutrient Intakes. These questions include those that ask about the dietary intake of the major food groups and fast food. There are also questions about how often a child eats, vitamin and mineral supplements and fluid intake.

Do you think that any of these items could be removed from a Toddler NutriSTEP?
   Probes: checking boxes, etc

What needs to be added to these items for a Toddler NutriSTEP?
   Probes:

**Question#2**

Next, I would like to discuss the questions about other factors that affect food intake and eating behaviours. These questions include questions about having enough money to buy food, who decides how much the child eats and whether or not the child eats in front of the TV, and how often the child eats.

Do you think that any of these items could be removed from a Toddler NutriSTEP?
   Probes: checking boxes, etc

What needs to be added to these items for a Toddler NutriSTEP?
   Probes:

**Question#3**

Next, I would like to discuss the questions about physical activity and sedentary behaviour. These questions ask about whether a parent thinks that the child gets enough activity and also a question about TV and computer time.
Do you think that either of these items could be removed from a Toddler NutriSTEP? 
Probes: checking boxes, etc

What needs to be added to these items for a Toddler NutriSTEP? 
Probes:

**Question #4**

Next, I would like to discuss the questions about physical growth. These questions ask about whether a parent thinks about the child’s weight and being comfortable about how the child is growing.

Do you think that either of these items could be removed from a Toddler NutriSTEP? 
Probes: checking boxes, etc

What needs to be added to these items for a Toddler NutriSTEP? 
Probes:

**Question #5**

Next, I would like to discuss the questions about developmental and physical capabilities.

Do you think that this items could be removed from a Toddler NutriSTEP? 
Probes: checking boxes, etc

What needs to be added to this item for a Toddler NutriSTEP? 
Probes:

**Closure**

Does anyone want to add or clarify anything? 
Is there any other information regarding your thoughts about a Toddler NutriSTEP that you think would be useful for me to know? 
Thank you very much for coming this morning/afternoon/evening. Your time is really appreciated and your comments have been very helpful.
Appendix D. Focus Group Participant Package Contents
Toddler NutriSTEP™ Development
Focus Groups
Research Study Participant Information

Purpose of the Study

You are asked to take part in a research study conducted by Janis Randall Simpson, Heather Keller, Jillian Gumbley and Nicole Holland from the Department of Family Relations and Applied Nutrition at the University of Guelph and Joanne Beyers from the Sudbury & District Health Unit. A collaborator on this study is (this will be filled in with the specific public health unit, etc.). This research project is funded by the Canadian Institutes for Health Research.

This research is part on an ongoing program, Nutrition Screening Tool for Every Preschooler (NutriSTEP™) (www.nutristep.ca). NutriSTEP™ is a simple checklist of 17 questions about dietary intake, dietary patterns and physical activity, etc, that parents/caregivers can use to see if their preschool children (ages 3-5 years) are well nourished and are healthy eaters. This checklist is called a screening tool. This is the first nutrition screening tool for parents of preschoolers to be developed anywhere in Canada or the United States. NutriSTEP™ helps make parents more aware of the nutrition issues of preschoolers and helps identify if their children are at nutritional risk. As well, the process of nutrition screening directs parents to the proper community health and nutrition resources when it is necessary and reassure the parents of young children who are doing well.

During its 10-year development, and since the public release of NutriSTEP® in 2008, provincial and regional programs across Canada have requested that we develop a version of NutriSTEP that would be suitable for toddlers (ages 18–35 months). This research project is the first step in the development of a Toddler NutriSTEP.

Project Procedures

If you volunteer to participate in this study, you will be asked to attend a focus group at (this will be filled in depending on the location) and do the following:
• Read an information letter about the project
• Read and sign the consent form
• Fill out a questionnaire that includes information on your marital status, education level, language, etc.
• Fill out the current NutriSTEP™ questionnaire
• Participate in a discussion group (focus group) with other parents (8-10) of preschoolers

A moderator will facilitate the discussion and a research assistant will take notes. The discussions will be audio-taped to get an accurate account of the discussion. We will be seeking your input on the importance of the current questions and possible changes to the
current NutriSTEP to make it suitable for toddlers. This should take about 60 minutes on one occasion.

**Potential Risk and Discomforts**

The risk involved with taking part in this project is low. Filling out and scoring NutriSTEP™ and discussing preschool nutrition issues with other parents may cause concerns about feeding your child and concerns about your child’s nutritional health. Should you have concerns about your child’s nutrition, you can contact Janis Randall Simpson, a Registered Dietitian, to discuss your concerns.

**Potential Benefits to Participants and/or to Society**

How will you benefit? You will get a nutrition resource for toddlers and contacts for nutrition and health resources in your community. The overall benefit of this first phase of the Toddler NutriSTEP™ project is to make a nutrition screening tool for toddlers available for the first time in Canada.

**Confidentiality**

All responses and comments on the questionnaires and all comments made during the focus group discussions will be kept confidential by the research team. Your responses and comments will not be identified. Tapes and other research materials will be stored in a locked cabinet at the University of Guelph for seven years and will eventually be destroyed following approved procedures. Data collected from this project will be used as part of graduate and undergraduate student projects and may be published in journal articles.

**Participation and Withdrawal**

You can choose to take part in this project or not. If you do volunteer, you may stop at any time without consequences of any kind. You may refuse to answer any questions on the questionnaires or at the telephone interview and still remain in the project. You may also ask to have your child’s data removed from the project by contacting one of the researchers.

**Project Incentives**

To thank you and your preschooler for taking part in this phase of NutriSTEP™ project, we will provide a healthy snack at the focus group and give you a NutriSTEP measuring cup.

**Rights of Research Participants**

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your
participation in this research study. This study has been reviewed and received ethics
clearance through the University of Guelph Research Ethics Board. If you have question
regarding your rights as a research participant, please contact the Research Ethics Officer,
Sandy Auld University of Guelph, 437 University Centre, Guelph, ON N1G 2W1.
Phone: 519 824-4120, ext. 56606; FAX: 519 821-5236; E-mail: reb@uoguelph.ca.

Research Institute and Researchers

The researchers at the University of Guelph and the Sudbury & District Health Unit who
are conducting this project are listed below. Please feel free to contact them at any time
with any questions.
• Janis Randall Simpson, PhD, RD, Assistant Professor, Department of Family
  Relations and Applied Nutrition, University of Guelph, 519-824-4120, ext. 53843;
  rjanis@uoguelph.ca.
• Heather Keller, PhD, RD, Associate Professor, Department of Family Relations and
  Applied Nutrition, University of Guelph, 519-824-4120, ext. 52544;
  hkeller@uoguelph.ca.
• Joanne Beyers, MA, RD, Community Nutrition Specialist, Sudbury & District Health
  Unit, 705-522-9200, ext. 355; beyersj@sdhu.com.
• Jillian Gumbley, BSc, Research Assistant, Department of Family Relations and
  Applied Nutrition, University of Guelph, 519-824-4120, ext. 56174; @uoguelph.ca
• Nicole Holland, BASc, Research Assistant, Department of Family Relations and
  Applied Nutrition, University of Guelph, 519-824-4120, ext. 56174

The collaborators at the (this will be filled in who are conducting this project are listed
below. Please feel free to contact them at any time with any questions.
• Names will be filled in with the appropriate collaborator.
**Toddler NutriSTEP™ Development**

**Focus Groups**

**Consent Form**

**Signature of Parent/Legal Guardian**

- I, ________________________, have read the provided information for the Toddler NutriSTEP Development Study – Focus Groups as described herein. My questions have been answered to my satisfaction, and I am therefore providing informed consent on behalf of myself and my child __________________________, as indicated by my signature below.

- I know that I am free to stop taking part in the study at any time and that my confidentiality will be protected.

- I have been given a copy of this form.

**Name of Parent/Legal Guardian:** __________________________

(Please print)

**Signature of Parent/Legal Guardian:** __________________________ **Date:** __________________________

**Signature of Witness**

**Name of Witness:** __________________________

(Please print)

**Signature of Witness:** __________________________ **Date:** __________________________
Toddler NutriSTEP™ Development  
Focus Groups  

Participant Background Form  

We are interested in obtaining some information about you and your family in order to better understand the results of using the NutriSTEP™ screening tool. Please complete the following questions to provide us with some background information on your child and family. Provide only one response for each question. Feel free to not answer certain questions if they make you uncomfortable. 

Please do not put your name on this paper.

1. You have/will be filling in the NutriSTEP™ checklist. Please keep in mind the same preschool child when you answer the following questions:
   a) How old is the preschool child for whom you filled in NutriSTEP™ _______ (years)  
   b) What is the gender of this child? [ ] Male [ ] Female  
   c) Does your preschool child have a medical condition diagnosed by a doctor? [ ] Yes [ ] No  
      If Yes, please describe_______________________________________________

2. For the following people, what is the language they first learned as a child, the country they were born in, and ethnic or cultural background?

<table>
<thead>
<tr>
<th>First language</th>
<th>Mother</th>
<th>Father</th>
<th>Your Preschool Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country born in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnic or cultural background (e.g. First Nations, Italian, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Age and Gender
   a) Your age: ________  
   b) Are You: [ ] Male [ ] Female

4. Your Marital Status:  

5. a) How many PEOPLE live in your household (include all adults and children) __________  
    b) How many ADULTS live in your household? __________  
    c) How many CHILDREN live in your household? __________

6. What is YOUR highest level of education?  
   [ ] Elementary [ ] Some College/University  
   [ ] Some High School [ ] Graduated College/University  
   [ ] Graduated High School

7. What is your TOTAL household income after taxes?  
   [ ] less than $15,000 [ ] $30,000-$59,999 [ ] over $90,000  
   [ ] $15,000-$29,999 [ ] $60,000-$89,999 [ ] don’t know

Thank you for your input!
Appendix E. Survey Monkey Questionnaire
Pediatric RD Content Validation-Toddler NutriSTEP

1. Background and Instructions

The nutrition risk concerns of toddlers can be grouped into five categories:

- Food and Nutrient Intakes
- Physical Growth
- Developmental and Physical Capabilities
- Physical Activity and Sedentary Behaviour
- Other Factors Affecting Food Intake and Eating Behaviour.

There are 21 nutrition screening question stems that have been grouped into one of the above five categories. Some question stems can be included in more than one category but for the purposes of this survey, each question stem is listed in only one category. For the purposes of this survey, only the proposed question stems are listed, not the response options.

A question stem is the language used on the actual screening questionnaire to elicit responses from parents. The language for the question stems that you are reviewing is based on the original NutriSTEP® questionnaire for preschoolers. During the developmental phase for the toddler version, which is currently being conducted, parents will help us to identify any changes in this language to make sure it is clear to future respondents.

At this point, we are seeking your ranking of importance of the nutrition concept contained within each question stem based on your experience with identifying nutrition problems in toddlers. It is unlikely that all question stems will be used due to length of the screening tool; therefore, your ranking is vital to understanding where you, as an expert in the field, would place the importance of each question stem for inclusion on such a questionnaire.

If you do have comments about language of the question stems, please use the comment section in each grouping of questions to identify the suggested changes.

While completing the survey, please keep in mind the following information:
1. A toddler has been defined as a child aged 18-35 months.
2. The proposed question stems are designed to screen for nutrition risk to determine if a child requires a more comprehensive nutrition assessment.

There are 17 questions in this survey as well as your demographic information. There are three questions related to each of the five nutrition risk categories, a single question regarding importance of each category and one overall general comments section. Please complete the survey in full, which should take approximately 15 minutes.
2. Food and Nutrient Intake Category

1. How important is each of the question stems in this category to your concept of nutrition risk in toddlers?

<table>
<thead>
<tr>
<th>Question</th>
<th>Not important</th>
<th>Slightly Important</th>
<th>Somewhat Important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child usually eats grain products. Examples are bread, bagel, bun, cereal, pasta, rice, roti and tortillas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. My child usually has milk products. Examples are breast milk, formula, white or chocolate milk, cheese yogurt, milk puddings or milk substitutes such as fortified soy beverages.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. My child usually eats fruit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. My child usually eats vegetables.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. My child usually eats meat, fish, poultry or alternatives. Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. My child usually eats restaurant or take-out fast foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. My child is not hungry at mealtimes because he/she drinks all day.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. My child usually eats ____ times per day.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. My child usually takes supplements.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments
2. Rank the importance of each question stem in this category relative to all the question stems in this category. Rank 1 as most important and 9 as least important.

<table>
<thead>
<tr>
<th>Key Draft Text</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child usually eats grain products. Examples are bread, bagel, bun,</td>
<td></td>
</tr>
<tr>
<td>cereal, pasta, rice, roti, and tortillas.</td>
<td></td>
</tr>
<tr>
<td>2. My child usually has milk products. Examples are breastmilk, formula,</td>
<td></td>
</tr>
<tr>
<td>white or chocolate milk, cheese, yogurt, milk puddings or milk substitutes,</td>
<td></td>
</tr>
<tr>
<td>such as fortified soy beverages.</td>
<td></td>
</tr>
<tr>
<td>3. My child usually eats fruit.</td>
<td></td>
</tr>
<tr>
<td>4. My child usually eats vegetables.</td>
<td></td>
</tr>
<tr>
<td>5. My child usually eats meat, fish, poultry or alternatives. Alternatives</td>
<td></td>
</tr>
<tr>
<td>can be eggs, peanut butter, tofu, nuts, or dried beans, peas, or lentils.</td>
<td></td>
</tr>
<tr>
<td>6. My child usually eats restaurant or take-out “fast foods”.</td>
<td></td>
</tr>
<tr>
<td>7. My child is not hungry at mealtimes because he/she drinks all day.</td>
<td></td>
</tr>
<tr>
<td>8. My child usually eats ___ times per day.</td>
<td></td>
</tr>
<tr>
<td>9. My child usually takes supplements.</td>
<td></td>
</tr>
</tbody>
</table>

**Comments**

3. Do you have comments on the wording of any of the question stems in this category? Please be specific.
Pediatric RD Content Validation-Toddler NutriSTEP

3. Physical Growth Category

1. How important is each of the question stems in this category to your concept of nutrition risk in toddlers?

<table>
<thead>
<tr>
<th></th>
<th>Not important</th>
<th>Slightly Important</th>
<th>Somewhat important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am comfortable with how my child is growing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I think my child weighs (too little/too much).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments

2. Rank the importance of each question stem in this category relative to all the question stems in this category. Rank 1 as most important and 2 as less important.

<table>
<thead>
<tr>
<th></th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am comfortable with how my child is growing.</td>
<td></td>
</tr>
<tr>
<td>2. I think my child weighs (too little/too much).</td>
<td></td>
</tr>
</tbody>
</table>

Comments

3. Do you have comments on the wording of either of the question stems in this category? Please be specific.

Comments
4. Developmental and Physical Capabilities Category

1. How important is each of these question stems to your concept of nutrition risk in toddlers?

<table>
<thead>
<tr>
<th>Question</th>
<th>Not important</th>
<th>Slightly important</th>
<th>Somewhat important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child has problems chewing/swallowing/gagging/choking when eating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. My child usually feeds himself/herself.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. My child usually drinks from a bottle.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. My child usually takes a bottle to bed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. My child usually eats baby food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments

2. Rank the importance of each question stem in this category relative to all the question stems in this category. Rank 1 as most important and 5 as least important.

<table>
<thead>
<tr>
<th>Question</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child has problems chewing/swallowing/gagging/choking when eating.</td>
<td></td>
</tr>
<tr>
<td>2. My child usually feeds himself/herself.</td>
<td></td>
</tr>
<tr>
<td>3. My child usually drinks from a bottle.</td>
<td></td>
</tr>
<tr>
<td>4. My child usually takes a bottle to bed.</td>
<td></td>
</tr>
<tr>
<td>5. My child usually eats baby food.</td>
<td></td>
</tr>
</tbody>
</table>

Comments
3. Do you have comments on the wording of any of the question stems in this category?
Please be specific.
5. Physical Activity and Sedentary Behaviour Category

1. How important is each of the question stems in this category to your concept of nutrition risk in toddlers?

<table>
<thead>
<tr>
<th>Question</th>
<th>Not important</th>
<th>Slightly important</th>
<th>Somewhat important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child usually sits in a stroller or car seat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. My child usually watches TV, uses the computer, or plays video games.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments

2. Rank the importance of each question stem in this category relative to all the question stems in this category. Rank 1 as most important and 2 as less important.

<table>
<thead>
<tr>
<th>Question</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My child usually sits in a stroller or car seat.</td>
<td></td>
</tr>
<tr>
<td>2. My child usually watches TV, uses the computer, or plays video games.</td>
<td></td>
</tr>
</tbody>
</table>

Comments

3. Do you have comments on the wording of either of the question stems in this category? Please be specific.

Comments
6. Other Factors Affecting Food Intake and Eating Behaviours Category

1. How important is each of the question stems in this category to your concept of nutrition risk in toddlers?

<table>
<thead>
<tr>
<th>Question</th>
<th>Not important</th>
<th>Slightly important</th>
<th>Somewhat important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have difficulty buying food to feed my child because food is expensive.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I usually let my child decide how much to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. My child usually eats meals while watching TV.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments

2. Rank the importance of each question stem in this category relative to all the question stems in this category. Rank 1 as most important and 3 as least important.

<table>
<thead>
<tr>
<th>Question</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have difficulty buying food to feed my child because food is expensive.</td>
<td></td>
</tr>
<tr>
<td>2. I usually let my child decide how much to eat.</td>
<td></td>
</tr>
<tr>
<td>3. My child usually eats meals while watching TV.</td>
<td></td>
</tr>
</tbody>
</table>

Comments

3. Do you have comments on the wording of any of the question stems in this category? Please be specific.

Comments
# Pediatric RD Content Validation-Toddler NutriSTEP

## 7. Ranking Categories

1. **Of the following five categories that help describe nutrition risk in toddlers please rank in order of most to least important. Rank 1 as most important and 5 as least important.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and nutrient intakes</td>
<td></td>
</tr>
<tr>
<td>Physical growth</td>
<td></td>
</tr>
<tr>
<td>Developmental and physical capabilities</td>
<td></td>
</tr>
<tr>
<td>Physical activity and sedentary behaviour</td>
<td></td>
</tr>
<tr>
<td>Other factors affecting food intake and eating behaviours</td>
<td></td>
</tr>
</tbody>
</table>

Comments. Please be specific.
8. Additional Comments and Demographic Information

1. Do you have any additional comments? Please be specific. If you have any suggestions for re-wording please include these.

2. Please provide your contact information.

- Name: 
- Company: 
- Address 1: 
- Address 2: 
- City/Town: 
- State/Province: 
- ZIP/Postal Code: 
- Country: 
- Email Address: 
- Phone Number: 

Page 10
Appendix F. Invitation to Pediatric Dietitians to Participate in Study
Invitation to Participate

Pediatric RD Content Validation of a Toddler NutriSTEP®

Background Information

This research is part of an ongoing program, Nutrition Screening Tool for Every Preschooler (NutriSTEP®) (www.nutristep.ca). NutriSTEP® is a valid and reliable 17-item, parent-administered, questionnaire for nutritional risk in preschoolers (3-5 years of age). During its 10-year development, and since the public release of NutriSTEP® in 2008, there has been an expressed need across Canada for an adaptation of the existing NutriSTEP questionnaire for toddlers (18-36 months of age).

The specific objective for this CIHR funded research project is to adapt/develop the current NutriSTEP® questionnaire for toddlers using the previously-established methodological template. The first step in this process is to establish the content validity of a new questionnaire by determining what additions/deletions should be made to the current NutriSTEP® questionnaire to make it suitable for toddlers versus preschoolers.

A literature review was conducted and content feedback has been gathered from two groups of Ontario dietitians (Family Health Teams, n=65 and Public Health/Family and Child Health, n=20) this past fall and winter 2010. Six focus groups with geographically and ethnically diverse Ontario parents (n=48) of toddlers were conducted this spring. This data has been analyzed resulting in 21 items for Pediatric RD Content Validity.

Content validity is the clarity and completeness of the tool content. This means the items are relevant to what is being measured, which is nutrition risk in toddlers. This includes a critical review of the tool content through consultations with nutrition and pediatric experts to ensure that the items are relevant to this age group and that it includes important deciding factors for identifying nutrition risk. See below the accompanying definitions for nutrition risk, nutrition assessment, nutrition screening and the differences between screening and assessing for nutrition risk.

Pediatric RDs' Roles and Timelines in Content Validity Phase

Activity # 1, August 2010: Participate in an online survey to provide your feedback on the 21 items in their proposed question wording (also called an item stem); the response categories will not be included at this stage. You will be asked your level of agreement of each item stem as an important nutrition risk factor. You will then be asked to rank each item stem relative to the other item stems in the same nutrition risk category/construct. And lastly, you will be asked to comment on the wording of the item stems. This survey should take 15 minutes to complete.

Activity # 2, September 2010: Participate in a group teleconference to review and analyze the overall responses to the online survey and determine a consensus on the item stems. This teleconference will take up to 90 minutes. Potential dates include: September 24, 27 or October 1.

For your participation, you will receive a $25 Chapter's gift card.

If you are interested in participating, please email Lee and Jillian by July 22.

Thank you in advance for your interest and support.
DEFINITIONS

**Nutrition Risk:** The presence of factors or characteristics that are related to a person's nutritional status. These factors influence a person's food intake and changes in biochemical or body systems (including growth in children). If these risk factors are not addressed, malnutrition will result over time.

**Nutrition Screening:** The process of identifying characteristics known to be associated with dietary or nutritional problems. The purpose is to differentiate individuals who are at high risk of nutritional problems or have poor nutritional status.

**Nutrition Assessment:** Comprehensive approach to define nutritional status that uses medical, nutrition and medication histories; physical examination; anthropometric measurements; and laboratory data.

**Nutrition Screening**
- Can be self-administered or assisted
- RDs provide guidance to support the screening process and are a referral source used to identify potential nutrition problems
- All clients receive nutrition information
- Nutrition problems referred for further assessment or services

**Nutrition Assessment**
- Requires RD skills
- To assess for problems or confirm/clarify previously identified nutrition problem(s)
- Involves more accurate identification of problems and recommended course of action
- May occur in response to a problem(s) seen by nutrition screening
- Clients receive individual nutrition counselling based on a nutritional assessment
- May also receive referral for a medical assessment or to other services
Appendix G. Teleconference Discussion Guide
Toddler NutriSTEP® RD Consensus Guide

As a group, the ranking of importance in describing nutrition risk in toddlers by category was as follows (with 1 as most important and 5 as least important):

1. Food and nutrient intakes
2. Physical growth
3. Developmental and physical capabilities
4. Physical activity and sedentary behaviour
5. Other factors affecting food intake and eating behaviours

In order to screen for each of these nutrition risk categories, the following questions and response categories have been proposed and require further refinement and consensus as a group.

Physical Growth

As a group of RDs, you felt the two questions that were proposed for this category were important but preferred the growth question over weight.

While physical growth is an important concept for RDs, it is difficult to screen this concept in a parent-completed questionnaire. Remember screening for physical growth risk will help to identify those parents who are overly concerned about their child’s growth. We do know the following two questions are valid and reliable with parents of preschoolers.

I am comfortable with how my child is growing:
- 0 ☐ Yes
- 4 ☐ No

I think my child:
- 4 ☐ Should weigh more
- 0 ☐ Is about the right weight
- 2 ☐ Should weigh less

Does the current wording and response categories in these two questions sufficiently screen “physical growth” risk in toddlers?

Would you ask both questions?
Would you suggest other wording? Other questions?
Other comments?

Developmental and Physical Capabilities
As a group of RDs, you felt the five questions that were proposed for this category needed further clarification (e.g. what is a bottle, what is pureed food, feeding self vs parent feeding, parent using the bottle for ease, less mess, etc).

We propose reducing this category to four questions and adding some clarification to some of the questions.

My child has problems chewing, swallowing, gagging or choking when eating:

- 4 □ Most of the time
- 2 □ Sometimes
- 1 □ Rarely
- 0 □ Never

My child feeds his/her self.

- 4 □ Most of the time
- 2 □ Sometimes
- 1 □ Rarely
- 0 □ Never

My child drinks from a baby bottle.

- 4 □ Most of the time
- 2 □ Sometimes
- 1 □ Rarely
- 0 □ Never

My child eats pureed foods.

*Examples are jarred baby food and pureed table foods.*

- 4 □ Most of the time
- 2 □ Sometimes
- 1 □ Rarely
- 0 □ Never

Does the current wording and response categories in these four questions sufficiently screen “developmental and physical capabilities” risk in toddlers?

Would you ask all four questions?

Would you suggest other wording? Other questions?

Other comments?

Physical Activity and Sedentary Behaviour
As a group, you felt the question on sedentary behaviour re: car seat, stroller use was vague, confusing and not capturing the risk behaviour we were looking for. And so we would propose one question for this category:

My child usually watches TV, or uses the computer, or plays video games:

4 □ 5 or more hours a day
3 □ 4 hours a day
2 □ 3 hours a day
1 □ 2 hours a day
0 □ 1 hour or less a day

*Does the current wording and response categories in this question sufficiently screen “physical activity and sedentary behaviour” risk in toddlers? Would you suggest other wording? Other questions? Other comments?*

**Other Factors Affecting Food Intake and Eating Behaviours**

As a group, there was very little feedback on the three questions in this category. And so we would propose the following three questions and response categories (which were taken from the existing Preschool NutriSTEP questionnaire):

I let my child decide how much to eat:

0 □ Always
1 □ Most of the time
2 □ Sometimes
3 □ Rarely
4 □ Never

My child eats meals while watching TV:

4 □ Always
3 □ Most of the time
2 □ Sometimes
1 □ Rarely
0 □ Never

I have difficulty buying food to feed my child because food is expensive:

4 □ Most of the time
2 □ Sometimes
1 □ Rarely
0 □ Never
Does the current wording and response categories in these three questions sufficiently screen “other factors affecting food intake and eating behaviour” risk in toddlers? Would you suggest other wording? Other questions? Other comments?

Food and Nutrient Intakes
As a group, this was the most important category and you felt 8 out of 9 of the proposed questions were very important and the question about supplement intake was considered somewhat important by many RDs. There were suggestions to combine the vegetable and fruit question for this age group. And so we would propose the following eight questions and response categories:

My child usually eats grain products:
*Examples are bread, bagel, bun, cereal, pasta, rice, roti and tortillas.*

- 0 □ More than 5 times a day
- 1 □ 4 to 5 times a day
- 2 □ 2 to 3 times a day
- 4 □ Less than 2 times a day

My child usually has milk products:
*Examples are breastmilk, formula, white or chocolate milk, cheese, yogurt, milk puddings or milk substitutes, such as fortified soy beverages.*

- 0 □ More than 3 times a day
- 1 □ 3 times a day
- 2 □ 2 times a day
- 4 □ Once a day or less

My child usually eats vegetables and fruit:

- 0 □ More than 4 times a day
- 1 □ 3 to 4 times a day
- 2 □ 2 times a day
- 3 □ Once a day
- 4 □ Not at all

My child usually eats meat, fish, poultry or alternatives:
*Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils.*

- 0 □ More than 2 times a day
- 1 □ 2 times a day
- 2 □ Once a day
- 3 □ A few times a week
- 4 □ Not at all
My child usually eats restaurant or take-out “fast food”:
4☐ 4 or more times a week
3☐ 2 to 3 times a week
2☐ Once a week
1☐ A few times a month
0☐ Once a month or less

My child is not hungry at mealtimes because he/she drinks all day:
4☐ Most of the time
2☐ Sometimes
1☐ Rarely
0☐ Never

My child usually eats:
4☐ Less than 2 times a day
3☐ 2 times a day
1☐ 3 to 4 times a day
0☐ 5 to 6 times a day
2☐ More than 6 times a day

My child usually takes supplements:
Examples are multivitamins, iron drops, cod liver oil and meal replacements.
4☐ Always
3☐ Most of the time
2☐ Sometimes
1☐ Rarely
0☐ Never

Does the current wording and response categories in these eight questions sufficiently screen “food and nutrient intake” risk in toddlers?
Would you suggest other wording? Other questions?
Other comments?

Overall, do you have any additional comments?
If we wanted to drop one question from the 18 proposed questions, which one would you choose to be omitted from the questionnaire?

THANK YOU!
Appendix H. Summary of Focus Group Findings
Summary of focus group results: parental feedback and opinions of toddler nutritional issues to be considered for inclusion on a toddler nutrition risk screening questionnaire

**Food and Fluid Intake**

- Parents agree that a single question about each food group is important
  - **Reasoning:** some toddlers often consume foods from only one of two food groups & best indication of toddler’s eating habits
  - **Suggestions:** addition of breast milk and formula as examples of milk products; addition of examples of other fortified milk beverages such as rice milk; combination of separate fruit and vegetable questions into a single question (controversial); addition of question regarding type of milk being provided to toddler (full vs. low-fat milk)

- Parents express that a fast food question is important
  - **Reasoning:** very common among toddlers; contributing to overweight and obesity
  - **Suggestions:** clarify definition of fast food; limit to restaurant fast food; include convenience and processed foods in the definition of fast food, or add a question to measure intake of these; provide examples of fast foods
  - **Concerns:** toddlers may be consuming healthier fast food options; how would frozen and canned foods be classified

- Parents agree that a question asking about excessive fluid consumption resulting in toddlers not being hungry at mealtimes is important
  - **Reasoning:** toddlers consume a lot of fluids in comparison with older children, especially milk and juices; many toddlers still consume milk as a meal replacement or a comfort

- Parents agree it is important to ask a question about the number of times toddlers are eating per day
  - **Reasoning:** difficult to get toddlers to consume distinct meals, which results in continuous grazing
  - **Concerns:** difficulty understanding what would be considered an eating occasion (meals vs. snacks)

- Parents agree that a question asking about supplement use is important
  - **Reasoning:** children under 2 years of age should not be consuming supplements; parents often use supplements to compensate if they believe toddler is not eating enough, or not consuming appropriate nutrients; parents lack knowledge about supplementation and can be dangerous
  - **Suggestions:** add more examples that are “normal” such as vitamin C etc.
  - **Concerns:** parents may say yes based on Vitamin D supplementation which is recommended in infancy by doctors

- Parents suggest an additional question about consumption of treats such as sweets and candies

- Parents suggest an additional question about consumption of fruit juices and sweetened beverages
  - **Concerns:** some parents water down juices which may make answering this difficult; should pure fruit juice be included
Factors Affecting Food Intake

- Parents express that food insecurity may be an issue for some parents
  - Reasoning: many express difficulty buying foods that are healthy and incorporating fresh foods and dietary variety
  - Controversy: some parents express that this shouldn’t be an issue due to programs and services available to assist parents with buying food
  - Suggestion: change question to address whether parents have “trouble buying certain foods” because of the added expense of buying “healthy” foods

- Parents express that they use TV as a distraction at mealtimes to get toddlers to eat
  - Reasoning: many parents express that when toddlers are distracted they are more likely to eat foods that they normally dislike or refuse such as fruits and/or vegetables; some state the distraction takes away from family mealtime experience
  - Controversy: other parents express that if toddlers are watching TV while eating they are less likely to eat

- Parents express a question asking if toddlers eat meals at locations other than the table is important
  - Reasoning: parents express difficulty in getting toddlers to sit at the table for mealtimes

- Parents express that a question about picky eating is important
  - Reasoning: most parents identify toddler’s as picky eaters; picky eating can cause parents to force children to eat and this makes mealtime unhappy; causes parents anxiety and results in them resorting to pressuring/bribing
  - Suggestions: combine with supplement use question as often parents resort to supplementing due to picky eating

- Parents express a question asking about the use of rewards is important
  - Reasoning: rewards are commonly used to get toddlers to eat; express that many parents use rewards and believe they are necessary and beneficial; lack of education about negative effects of offering rewards

- Parents believe that it is important to ask about whether children are allowed to decide how much they want to eat
  - Reasoning: many parents force children to eat, and they may not be hungry; parents are often not satisfied will how much their children are eating
  - Concerns: all parents express that they have to restrict eating of certain foods sometimes

- Parents believe asking about the length of mealtimes may be important
  - Reasoning: express that due to scheduling, many parents are too busy to sit down for mealtimes; some children who are always eating alone will not eat as much due to boredom; family meals can be engaging for toddler

- Parents suggest a question asking about participation in social activities such as play groups is important
o Reasoning: participation in social activities will expose toddlers to healthy role modeling by other parents and peers

• Parents suggest additional question asking if toddlers are involved in meal preparation in any way
  o Reasoning: some parents express that participation or involvement with preparation may make toddlers more interested in food and increase likelihood that they will be excited to try it

• Parents suggest an additional question about whether the family has a structured routine in place
  o Reasoning: sleep patterns can affect eating behaviors and appetite of toddlers

**Physical Activity and Sedentary Behaviour**

• Most parents do not believe that a question about physical activity is important for toddlers
  o Reasoning: toddlers are generally “busy” moving all day, therefore do not participate in structured physical activity
  o Suggestions: maybe ask if the child needs encouragement to be active, rather than if they child is physically active

• Parents express that a question geared more towards sedentary behavior is more important than physical activity
  o Reasoning: excess sedentary time would indicate a lack of physical activity; toddlers watch too much TV
  o Suggestions: add other examples of sedentary behaviours such as reading, colouring, and time spent in a stroller or car seat

**Physical Growth & Developmental Capabilities**

• Most parents express that a question about parental concern and comfort with growth is important
  o Reasoning: expressed that parents are always concerned about their toddler’s growth and they can change feeding practices based on these concerns
  o Concerns: many parents may not be concerned with their child’s growth even though the child is not a healthy weight

• Parental opinion on a question about weight status of toddlers was mixed
  o Reasoning: Some express that weight may be related to genetics and factors other than nutrition, and that weight is “just an average or guideline” and is not as important as growth; others express that a lot of parents don’t see excess weight as a concern in young children, but that this question could raise awareness
  o Concerns: most parents are not aware of their child’s weight, as well as the recommended weights, so it would be difficult for them to assess whether their child is the right weight or not
  o Suggestions: adding “I think” to a question asking parents if their child is the right weight, as most do not know for sure; asking for actual weight and height
• Most parents identified that a question about choking and problems swallowing is important
  o Reasoning: although many parents expressed this is not common, they identified it does occur in some children and it causes feeding related issues
• Parents expressed that a question about difficulty consuming certain textures may be important
  o Reasoning: many toddlers will chew food and then spit out, or have trouble swallowing specific textures; some toddlers have trouble with this when they start solid foods making the transition difficult for parents
• Parents believe a question about whether children are feeding themselves is important
  o Reasoning: many parents don’t let their toddlers feed themselves as it is too slow or too messy
  o Concerns: toddlers are likely not always feeding themselves, probably only some of the time
  o Suggestions: may ask how often they are feeding themselves, rather than if they are or are not feeding themselves; also should specify whether this involves using utensils or hands or both
• Parents express that a question asking if toddlers are drinking from a regular cup is important
  o Reasoning: some children take a long time to transfer from a bottle or “sippy-cup” to a regular cup; those toddlers drinking from a bottle are consuming too much fluid
• Parents express a question asking if toddlers are consuming bottles at bedtime is important
  o Reasoning: no nutritional issues identified, but causes dental issues
• Some parents believe a question asking if toddlers are using “soothers” is important
  o Reasoning: no reasoning provided
Appendix I. Toddler NutriSTEP Item Stems (Draft 1a)
Toddler NutriSTEP Item Stems (Draft 1a)

1. My child usually eats grain products: Examples are bread, bagel, bun, cereal, pasta, rice, roti and tortillas
2. My child usually has milk products: Examples are (breast milk, formula)*, white or chocolate milk, cheese, yogurt, milk puddings or milk substitutes such as fortified soy beverages
3. My child usually eats fruit
4. My child usually eats vegetables
5. My child usually eats meat, fish, poultry or alternatives
6. My child usually eats (restaurant or takeout)* fast food
7. My child is not hungry at mealtimes because he/she drinks all day
8. My child usually eats ____ times per day
9. My child usually takes supplements
10. I am comfortable with how my child is growing
11. (I think)* my child weighs (too little/too much)
12. My child has problems chewing/swallowing/gagging/choking when eating
13. My child usually sits in a stroller or car seat**
14. My child usually watches TV, uses the computer, or plays video games
15. I have difficulty buying food to feed my child because food is expensive
16. I (usually)* let my child decide how much to eat
17. My child (usually)* eats meals while watching TV
18. My child usually feeds his/her self**
19. My child usually drinks from a bottle**
20. My child usually takes a bottle to bed**
21. My child usually eats baby food**
22. My child usually eats processed foods**
23. My child usually eats sweets, candies and baked goods**
24. My child usually drinks fruit juices or sweetened drinks**
25. My child is usually offered rewards related to eating behaviours**
26. My child is usually a picky eater**
27. My child usually participates in social activities outside of the home**
28. My child usually follows consistent sleeping patterns**
29. My child usually consumes breast milk or formula**

*Modifications to preschooler NutriSTEP item stems based on literature review and/or parental input through focus groups
**Items identified in literature and/or by parents in focus groups, not currently included on preschooler NutriSTEP
Appendix J. Toddler NutriSTEP Item Stems (Draft 1b)
Toddler NutriSTEP Item Stems (Draft 1b)

1. My child usually eats grain products: Examples are bread, bagel, bun, cereal, pasta, rice, roti and tortillas
2. My child usually has milk products: Examples are breast milk, formula, white or chocolate milk, cheese, yogurt, milk puddings or milk substitutes such as fortified soy beverages
3. My child usually eats fruit
4. My child usually eats vegetables
5. My child usually eats meat, fish, poultry or alternatives
6. My child usually eats restaurant or takeout fast food
7. My child is not hungry at mealtimes because he/she drinks all day
8. My child usually eats ____ times per day
9. My child usually takes supplements
10. I am comfortable with how my child is growing
11. I think my child weighs (too little/too much)
12. My child has problems chewing/swallowing/gagging/choking when eating
13. My child usually sits in a stroller or car seat*
14. My child usually watches TV, uses the computer, or plays video games
15. I have difficulty buying food to feed my child because food is expensive
16. I usually let my child decide how much to eat
17. My child usually eats meals while watching TV
18. My child usually feeds his/her self*
19. My child usually drinks from a bottle*
20. My child usually takes a bottle to bed*
21. My child usually eats baby food*

*Items identified by parents in focus groups, not currently included on preschooler NutriSTEP
Appendix K. Toddler NutriSTEP Item Stems Final Draft
1. My child usually eats grain products:
   *Examples are bread, bagel, bun, cereal, pasta, rice, roti and tortillas.*
2. My child usually has milk products:
   *Examples are breastmilk, formula, white or chocolate milk, cheese, yogurt, milk puddings or milk substitutes, such as fortified soy beverages.*
3. My child usually eats vegetables and/or fruit:
4. My child usually eats meat, fish, poultry or alternatives:
   *Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils*
5. My child usually eats restaurant or take-out “fast food”:
6. My child usually drinks juice or flavoured beverages.
   *Flavoured beverages can be fruit drinks, pop, koolaid or sports drinks.*
7. I have difficulty buying food to feed my child because food is expensive:
8. My child has problems chewing, swallowing, gagging or choking when eating:
10. My child drinks from a baby bottle.
11. My child eats pureed foods.
   *Examples are jarred baby food and pureed table foods.*
12. My child is *not* hungry at mealtimes:
13. My child usually eats:
14. I let my child decide how much to eat:
15. My child eats meals while watching TV, or being read to, or playing with toys:
16. My child usually takes supplements:
   *Examples are multivitamins, iron drops, cod liver oil and meal replacements.*
17. My child usually watches TV, or uses the computer, or plays video games:
18. I am comfortable with how my child is growing:
19. I think my child: (should weigh more, is about the right weight, should weigh less)