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Laurea University of Applied Sciences **Abstract**
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This study assesses nutrition knowledge and preference of 4 to 6-year-old Finnish and Indian preschool students. The study was conducted within the context of the FINDIgATE project, which focuses on the wellbeing of children in India and Finland and is intended to contribute to the overall improvement of wellbeing in children. The governments of Finland and India have committed to improving child wellbeing and have mandated compulsory school and free lunch. These initiatives are a positive step, yet there remain significant health concerns such as anemia, obesity and a rise in nutrition-related noncommunicable disease among school-aged children.

Previous research indicates that nutrition knowledge in adults results in increased overall health and decreases in noncommunicable diseases. Risk factors for noncommunicable diseases such as diabetes, obesity and cardiovascular disease are occurring earlier in childhood and prevention strategies should occur at the same time. Earlier interventions and education may change the nutritional habits and could result in positive health outcomes for life. The aim of this study was to assess nutrition knowledge and preference of 4 to 6-year-old Finnish and Indian preschool students. The objectives were to compare nutrition-related health knowledge and nutrition-related preferences of preschool children according to nationality, gender, BMI, and age.

Forty-three informants, 23 in India and 20 in Finland, completed two, 15-item pictorial questionnaires. All participants were between the ages of four years and six years and eleven months. The questionnaire responses were used to determine knowledge and preference toward nutritional food. Due to the participants' developmental stage a facial analog, Likert-type scale was used for the responses. A pilot revealed that a 3-point Likert-type scale was more appropriate than a 5-point Likert-type scale for this age group.

The results were operationalized to reveal nutritional knowledge and preference for nutritional food. This study does not support a link between pre-operational children's nutrition knowledge and the preferences they have towards food. Although high levels of nutrition knowledge were shown there was no indication that this knowledge impacted preferences. The differences between the groups - nationality, gender, BMI and age - were also very small. The only two statistically significant differences were unpreferability between the nationalities ($p=0.000$) and ignorance, also between nationalities ($p=0.032$).

As a health promotion and prevention strategy, the results can be used to support the argument for evidence-based interventions to overcome nutrition knowledge barriers in pre-operational children and to continue to provide nutritious options to preschool children. The results support the assistance with food choices, regardless of knowledge of this age group. This study offers strong support for continued subsidized school meals and education for guardians and children related to nutrition from very early in life.

Keywords: Nutrition Knowledge, Nutrition Preference, Pre-operational, Nutrition Education, Preschool

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1 Background of the project

Global concern with obesity and associated noncommunicable diseases is demonstrated by the World Health Organization's Global Action Plan (2017) which introduced a target to halt the rise in obesity by 2025. In addition, The World Health Organization (WHO)'s nutrition-friendly schools initiative (2017) reported that nutrition-related health problems in children are increasingly significant causes of disability and premature death worldwide. The emphasis on the well-being of children is further supported by United Nations Human Rights, Article 24 of the Convention on the Rights of the Child (1990) which addresses the inherent right of children to have access to education regarding nutrition. The United Nations, Section (e) of Article 24 (1990) states that "parents and children must be informed, have access to education and be supported in the use of basic knowledge of child health and nutrition." Nutrition and diet can have both positive and negative impacts on health throughout life and a person's diet may impact future development of disease such as cancer, diabetes and cardiovascular disease (WHO 2003). Nutrition knowledge has been explored as a determinant to wellbeing in adults and adolescents in many countries although, similar studies on pre-operational children are missing. The WHO (2002) identified the role of diet and nutrition as determinants of chronic noncommunicable disease and suggested that these determinants should occupy a prominent position in prevention programs. The evidence supporting long-term impacts on health and wellbeing make studies on children especially salient, as early intervention and a focus on wellbeing can provide a lifetime of positive returns.

Finland and India, among many other countries, have made a commitment to improving children's health and nutrition. The Finnish National Board of Education (2008), labeled school meals as pedagogical tools to teach nutrition and healthy habits and subsequently increase consumption of vegetables, fruits, berries, whole bread. Likewise, Article 47 of the Constitution of India (2015) states that "the State shall regard raising the level of nutrition and standard of living of its people and improvement in public health among its primary duties". More recently, The Food and Nutrition Board - Ministry of Women and Child Development-India (2017) identified nutrition as the focal point of health and wellbeing and created programs such as nutrition education training, mass nutrition awareness campaigns, development and distribution of nutrition education and training material to enhance wellbeing. As part of the commitment to health, Finland has offered free school lunch since 1948 (Finnish National Board of Education 2008) and India has had a midday meal program since 1995 (Elementary Education Mid-Day Meal Scheme 2016). These efforts to improve children's diet, nutritional status and wellbeing is laudable, however, noncommunicable diseases, malnutrition and obesity continue to be worldwide problems in children. In addition to providing food, problems in implementing the policies and other interventions, such as family education, and understanding of food choices, must also be identified and corrected.

The FINDIgATE project (Appendix 5) is a collaborative effort between higher education institutes in India and Finland. The motivation of the project is to collect best practices in Finnish and Indian school systems which enhance children's wellbeing. The identification of practices, and future development of innovations and changes which positively impact children's wellbeing is expected.

Within the framework of the FINDIgATE project, this study focuses on the health and nutritional aspect of children's wellbeing. According to Pollard and Lee (2003) there are five distinct domains of child wellbeing which include physical, psychological, cognitive, social, and economic. Because of the multi-dimensionality and subjective nature of wellbeing, a precise definition is difficult to find. Schües and Rehmann-Sutter (2013) propose that what children need, what they want and what they deserve defines wellbeing. It is well known that children's health status is instrumental in their overall wellbeing and impacts physical, emotional and mental performance. Health status and specifically, nutritional status, is the focus of wellbeing in this study. A healthy diet in the adult population is associated with a decrease in noncommunicable diseases such as high cholesterol, hypertension, diabetes and other cardiovascular diseases. It is a logical assumption that the same would be true of the relationship between diet and disease in children. According to Ogden, Carroll, Kit and Flegal (2012), more than 16 percent of children in the United States, aged six years to 19 years are obese. The World Health Organization (WHO) Fact Sheet on Obesity and Overweight (2016) lists the number of overweight or obese children under the age of five in 2016 as 41 million. Overweight and obesity, as well as their related noncommunicable diseases, are largely preventable. Supportive environments, such as schools, are fundamental in shaping children's health and nutrition choices. In addition to providing nutritious options, nutrition education introduced as early as preschool could be beneficial. The Centers for Disease Control and Prevention, (2012) identify health literacy is a key barrier to health promotion. As defined by Baker (2006) "health literacy is the ability to acquire health-related knowledge and make appropriate health related decisions." The Academy of Nutrition and Dietetics (2013) state that primary prevention in the form of nutrition knowledge and healthy choices are the most effective and affordable methods to prevent chronic diseases and positively effect health outcomes across the lifespan.

One deficit in existing research is the lack of investigation into pre-operational children and their knowledge and preference towards nutrition. Owen, Schickler, and Davies (1997) reinforce the need for studies on younger children as evidenced by the decrease in parental influence and subsequent increase in influence on attitudes by peer pressure, the media, and nutrition education. Several studies among the adolescent population have been completed that support a link between nutrition knowledge and overall health. For example, Schmidt et al. (2010) explored the positive relationship between health-related behavior, knowledge and

preferences in children from age nine. There has also been significant research into other variables related to food choice, such as advertising (Heard et al. 2016), and visual appeal (Kubacki et al. 2015). However, an extensive literature search revealed little appropriate research on nutrition knowledge and subsequent preferences in children under the age of seven. Nutrition knowledge in children could have the same positive impact as it does in adults, however the assessment is challenging. Ogden et al. (2014) argues that there is need for evidence-based interventions that can overcome health knowledge barriers to improve health outcomes for children at early literacy stages, particularly ages five to eleven. The first stage of this study was to determine the nutrition related knowledge of preschool children. The second step was to determine the nutrition related preferences of preschool children. This information was used to compare the nutrition related health knowledge and preferences according to nationality, gender, body mass index (BMI)-a measure of **body** fat based on height and weight- and age.

Birkenhead and Slater (2015) report that nutrition knowledge is one of the few modifiable factors that improve awareness of nutrition and result in better nutrition choices. According to Nyaradi et al (2016), the quality of early diet may even be a predictor for later academic achievement. As evidenced by previous research, implementation of early interventions and nutrition education may change nutritional habits and could result in positive outcomes over the lifespan. This study seeks illuminate the relationship between food choices and level of nutrition knowledge in pre-operational children. The results can then be used to create and implement measures to improve nutrition and lifelong health beginning in preschool. In this manner, the FINDIgATE purpose of increasing children's wellbeing has enormous, potential benefits for future generations.

2 Aim and objectives

The aim of this research was to assess nutrition knowledge and preferences of 4 to 6-year-old Finnish and Indian Preschool students.

Objectives

1. Compare nutrition related health knowledge of preschool children according to nationality, gender, BMI, and age.
2. Compare nutrition related preferences of preschool children according to nationality, gender, BMI, and age.

3 Project performance

FINDIgATE's (Appendix 5) purpose is to explore how the educational systems in India and Finland contribute to children's wellbeing. Within this project, many dimensions of wellbeing are being explored. The role of schools in enhancing wellbeing is important to children in both countries. Identifying opportunities for innovative practices, sharing and implementing these practices is a way that FINDiGATE can increase children's wellbeing.

3.1 Project methodology

The use of developmental evaluation was an effective method within the context of this project. Patton (2015, 211) identifies developmental evaluation as using evaluative questions and logic to support program development. The FINDiGATE project is supported by the evaluators' data collection and evidenced-based decision making in this formative stage to support future innovations. Patton (2015, 210, 292) describes the collaboration of project members to design and test new approaches for continuous improvement and intentional change as fundamental to developmental evaluation.

3.1.1 Project settings

This study was binational, taking place in Finland and India. The setting of the study in India was private preschools and Anganwadi Centers in Chennai during January of 2017. The Anganwadi centers are state operated and serve as an integral part of the Indian health and preschool system. According to the Ministry of Housing and Urban Affairs (2016) Chennai, is a large southern Indian city which had a population greater than 4 500 000 in 2011. The field study in Finland took place in a private preschool in the greater metropolitan area of Helsinki in February of 2017. According to the City of Helsinki (2016), the capital city had a population of 628 208 in 2016.

The collaboration with Loyola College in Chennai resulted in willing participation by many preschools. Bala Mandir Kamaraj Trust was the first site visited in Chennai and houses an orphanage, clinic and schools. The onsite preschool provides early education for the over 200 children of the orphanage as well as children from the nearby urban slum. Data from 13 informants were collected at this school on January 9, 2017. The second day, January 11, 2017 was at Loyola and Fatima Matriculation preschool. Seven children participated from this private school. The final day of data collection in India was on January 12, 2017 at St. Patrick's Nursery School where four preschool children participated.

The Finnish study participants were all students at Hansa Kindergarten, an independent preschool located in a suburb of Helsinki, Finland. Hansa is a private, English speaking preschool with monthly fees on the same level as public preschools. Twenty informants from Hansa Kindergarten in Espoo, Finland were interviewed on February 15, 2017.

3.1.2 Project participants

The participants in this study are 23 preschool children in India and 20 preschool children in Finland. This group has the unique characteristics of just beginning to make decisions for themselves. According to Erikson (1994), children between the ages of four and six years are concrete thinkers and are struggling with autonomy. Preschool-children are becoming more responsible for themselves and the choices they make, including food choices. This combination of factors creates a situation where knowledge could potentially impact decisions. A deeper understanding of the relationship between participants' knowledge and preferences can influence how much guidance is needed for food choice and healthy eating at this age. Children between 4 and 6-years old are, as defined by Piaget (1969), pre-operational, verbally unsophisticated, lack perceptual skills and are just beginning to develop reading skills. Uusiautti and Määttä (2013) argue that researchers should have the courage to collect information directly from children, which may require untraditional methods. In planning this study, many factors had to be considered such as level of development, verbal skills, lack of reading skills and concrete ways in which they express themselves.

3.2 Tool construction

The first phase of this study was to gather baseline nutrition knowledge from the participating children in India and Finland. An age appropriate nutrition knowledge tool was not found in previous research and therefore it was necessary to create a tool. In addition to the adaptation for age and limited communication abilities, the tool was also adapted to include culturally relevant foods. The second phase in the study was to assess the participants preferences towards foods. Merriam Webster (2017) defines preference as the act or fact of giving advantages to something over something else. Preferences, in this study, are represented by the participants desire to eat a food, no desire to eat the food or a neutral desire to eat the food. The same tool was used for both phases of the study, only the question being asked varied.

3.2.1 Pictorial questionnaires

The age and developmental level of the study participants necessitated a non-written questionnaire. In addition, the language barriers encountered by this binational study made an interview questionnaire very complicated. The use of interpreters would have potentially

degraded some of the responses. A pictorial questionnaire was designed where pictures of food are presented to the participants. In preparing the pictorial questionnaire, many different nutrition knowledge and nutrition literacy tools were reviewed. Because of the age of the participants in this study, none of the tools were appropriate as all required a remedial level of literacy and communication skills. After reviewing the literature on nutritional knowledge questionnaires, the characteristics for a pictorial tool were taken from the written tool by Parmenter & Wardle (2000) known as General Nutrition Knowledge Questionnaire (GNKQ). Aspects of the KAP tool by Fautsch Macías and Glasauer (2014), which lists foods which are rich in essential vitamins, to determine nutrition knowledge were also used. Although the KAP was more comprehensive, including hyegine and food security questions, nutrition related questions were utilized. For example, the KAP (Fautsch Macías & Glasauer 2014) asks participants to list meats which are iron-rich and nutritious. This questionnaire presents a picture of iron rich foods such as "salmon" and "pulses" and asks participants to indicate if they are healthy. To make the pictorial questionnaire usable for preliterate children pictures of foods rich in essential vitamins and identified as" healthy" were used as well as "unhealthy" foods.

Two pictorial questionnaires were used for this study. The first was the "Nutrition Related Health Knowledge Tool" and the second was the "Nutrition Related Preference Tool" (Appendix 1 and 2). Both tools utilize the same fifteen pictures, but the question asked prior to the completion of each tool is different. Before completion of the "Nutrition Knowledge Tool" the participants are asked to answer, "Is this food healthy or good for you?". Before beginning the "Nutrition Preference Tool" the participants were asked to rate "Would you like to eat this food". Each item on the questionnaire elicited a response on the accompanying 3-point facial Likert-type scale.

3.2.2 Pictorial questionnaire items

A fifteen-picture combination of healthy and non-healthy foods was used to create the questionnaires. The tool was limited to 15 pictures to insure that the children did not become bored, as with a longer questionnaire. Pictures of low-nutrient, energy-dense foods such as chips, ice cream, french fries and sodas were identified as items that would score "not healthy". In comparison, pictures of whole grains, vegetables, fruits, water, low fat dairy, and lean protein were included as "healthy" choices. The tool also uses culturally relevant examples of foods, depending on the country in which the participants were located. For the Finnish participants, the tool included photos of the recommended items on the United Nations food based dietary guidelines (2016), and the recommendations for "healthy" diet obtained from the Nordic Nutrition Recommendations (2012) as well as commonly consumed "unhealthy" and "healthy" items. For the Indian participants, the tool included photos of the

recommended items on the United Nations food based dietary (2016) and on and The National Institute of Nutrition's dietary guidelines (2011) as well as photos of common fast food and commonly consumed "healthy" and "unhealthy" items.

Barker and Weller (2003) acknowledge problems in creating ways of communicating with children but emphasize the importance of this awareness and overcoming the limitations when promoting the voices of children. According to Uusiautti and Määttä (2013), interviewing is an adult centered method of data collection. The tool created for this study has a range of answers and the questions are presented to illicit the child's opinion or knowledge, making them the expert. This presentation style was used to increase confidence and gain more honest responses from the informants.

3.2.3 Likert-type scale

In accordance with their developmental stage, a three-point "smiley-face" Likert-type scale was used by the participants to answer the questionnaires. The participants were asked to use a Likert-type scale facial scale, shown in Figure 1 (Blogspot 2016), to rate the healthfulness and preferability of each picture. For the nutrition knowledge questionnaire, the participants were instructed that the first, smiley-face, indicated a positive response, the food is healthy. The second face was neutral indicating neither positive or negative and the third face was frowning indicating a negative response, the food is not healthy. For the nutrition preference questionnaire, the participants were instructed that the first smiling face indicated a positive response meaning, they would like to eat this food. The second face was neutral, and indicated they would neither like or dislike to eat the food and the frowning face indicated that they would not like to eat the food. Before the actual data collection, each child was familiarized with the three-point smiley-face Likert-type scale.

Figure 1: A three-point Facial Likert-type Scale (Blogspot.com, 2016)

3.2.4 Face validity and piloting the data tool

Grove, Burns and Gray (2013, 394) identify the use of experts to assist with development and approval of items on an instrument as an effective way to validate that the items are appro-

priate, accurate and representative. In the development stage of this tool, thirteen master level health professionals in Finland completed the questionnaires to provide expert knowledge of "healthfulness" and cultural relevance for each item. Additionally, the Indian specific tool was validated by 2 native Nepalese master level nurses in Finland as well as three Indian master level students at Loyola College in Chennai. Originally 16 questions were presented. Question #13 was removed from both the Finnish and Indian questionnaire as more than 50% of the professionals were unable to identify the food item as healthy or unhealthy. All other questions were validated and identified, with 100 percent consensus, as healthy or not healthy.

Pilot studies are used as a means of developing data collection tools or data collection processes (Grove, Burns & Gray 2013, 46). In this study, the tool was piloted by five children to refine the questionnaire, identify problems, and determine usability of the tool prior to use. In the pilot, all children could identify the foods items and label them as healthy or unhealthy. During the pilot of the questionnaire, it was determined that "healthy" was not always clear to the participants, and as a result we continued to use healthy but also added "good for you" as clarification to the question. Initially, a five-point facial Likert-type scale was used to indicate a range of healthfulness and preferability. During the pilot it was revealed that the participants were confused by the five point-scale. The scale was simplified to a three-point scale which was then repeated with the pilot sample and was found to be much easier to use. Fautsch Macías and Glasauer (2014) also used a three-point scale in the KAP Attitude Module because pre-testing showed it was easier to measure attitudes with a three-point scale than with a five-point scale in children or respondents with little education.

3.3 Completion of questionnaires

The design of the questionnaires required little verbal communication between the researcher and the participants to accommodate age of respondents as well as differing native languages. In India, permission was granted by the administrators and teachers at the preschool while in Finland parental consent was obtained in advance and assistance was provided by teachers in identifying children whose parents consented. In each setting, the preschool teacher introduced the FINDiGATE project and indivual researchers to the students. In each classroom ten to fifteen minutes were spent interacting with children to create a level of trust prior to the individual interviews. The teachers then identified individual students who were to complete the questionnaires. After obtaining verbal consent from the participants, introductions were made.

In India, students from Loyola assisted with gathering the background information from the children, including name and age. They also assisted with interpreting and confirming under-

standing of the instructions for the questionnaire in Tamil, the local language, prior to the administration of the questionnaire. Although English was the medium of education, the use of the local language appeared to increase the children's comfort level and prevented any confusion with the questionnaires. The children were also asked to stand on a scale to obtain their weight and their height was also measured. In every situation the children were weighed using the same "Prego" digital scale and vertical height was measured with a retractable tape measure.

After collection of the background information the informant was seated in a quiet area of the classroom. Each item on the questionnaire was presented on an A4 sheet which included the picture of the food item and a representation of the three-point smiley face Likert-type scale (see Figure 1). After being asked the question, "Is this food healthy or good for you?" each item was individually shown. The participants then indicated a response by pointing to the chosen face on the Likert-type scale above the picture. This responses to each item were recorded by the interviewer. After the 15-item nutrition knowledge questionnaire was completed, the participants were then asked, "Would you like to eat this food?" This step constituted the nutrition preference questionnaire. The same pictures, in the same order, were shown to the informants and again responses were indicated by the children pointing at the chosen face on the Likert-type scale. The interviewer recorded the answers in real time.

Interviewing at the English-speaking preschool in Finland was performed in the same manner. However, background information was collected and verification of understanding of the instructions of the participants was completed by the interviewer without assistance. The preschool teacher made introductions and identified those students who were participating. The Finnish questionnaires were completed in a room adjacent to the classroom with full view of the teacher and other students. Each interview began with an introduction and the gathering of demographic data, to include name, age and sex as well as additional biometric data of height and weight. The instructions were then given, and the questionnaires were presented as in India. In piloting the tool, it was discovered that children thought of the interview as a game and were not only anxious to answer and participate but were also disappointed when the questions were completed. This reaction was also seen when the informants were completing the questionnaires.

3.4 Univariate descriptive statistics and demographic information

Munro (2005, 11) describes the use of univariate analyses, or the examination of each variable separately, as an essential step in checking the quality of the data. This study also used univariate analyses to evaluate the demographic data, and to describe the sample.

The demographic information collected from informants was used for descriptive statistics as shown in Table 1. The targeted population of preschool children includes the age groups from four to six years in both India and Finland. Of the participants, 30.2 percent were between four and four years and 11 months old, 58.1 percent were between five and five years 11 months old and 11.6 percent were between six years and six years 11eleven months old. The gender representation of the children was 62.8 percent female and 37.2 percent male. Forty-seven participants were Finnish and 54 were Indian. Using the Centers for Disease Control growth charts for children and teens aged two through nineteen years (2017), the BMI and percentile BMI were calculated from the reported age and measured height and weight of the participants. The limitations of the BMI results are that the CDC charts reflect the standards set for American children. Additionally, as exact birth dates were not available ages were rounded to the reported whole year. The resulting BMI estimations were labeled based on weight status for age and indicated that most participants, 9.3 percent were "underweight", 79.1 percent were "normal weight", 2.3 percent were "overweight", and 9.3 percent were "obese".

	Frequency	Percent
Age (n=43)		100
4 years	13	30.2
5 years	25	65.5
6 years	5	11.6
Nationality (n=43)		100
Finnish	20	46.5
Indian	23	65.5
BMI (n=43)		100
Underweight	4	9.3
Normal weight	34	79.1
Overweight	1	2.3
Obese	4	9.3
Gender (n=43)		100
Female	27	62.8
Male	16	37.2

Table 1: Demographic Information of the preschool children

3.5 Knowledge and preferences

According to Munro (2005, 139), the requirements for calculating a statistical difference between groups are a two-level independent variable and a continuous dependent variable. According to Grove, Burns and Gray (2013, 429) the use of summated scales, or the summation of the various responses, results in less random and systematic error. The individual answers to the questionnaire items are discrete data and therefore must be represented as ordinal data for statistical analysis. Grove, Burns and Gray (2013, 429) explain that the creation of summated variables is often used with Likert-type scales to measure a concept which is represented as continuous data. Using IBM SPSS analysis software, the numeric answers were

tallied to create summation variables. The resulting summation variables produced a mean that can be considered continuous data for statistical analysis.

The responses to the three item Likert-type facial scale on the questionnaires were given numerical equivalents. For both the knowledge and preference scale the first face ”smiling” equates to a number 3, the second face ”neutral” equates to a number 2 and the third face ”frowning” equates to the number 1. The correct identification of a food item as either healthy or unhealthy is identified as knowledge. A summation variable was computed for nutrition related knowledge by mean operator, labeled “knowledge” (see table 2). The mean value for the 9-item scale was 1.89, standard deviation (SD) 0.12. The minimum mean value was 1.44 and the maximum mean value was 2.0. The 6-item summation variable was also computed for “ignorance”. The mean value for the 6-item scale was 1.36, SD 0.39. The minimum mean value was 1.0 and the maximum mean value was 2.0. The key used to determine which foods were healthy versus unhealthy is described in the face validity section. The incorrect identification of a food item as either healthy or unhealthy or the admitted lack of knowledge (don’t know option) is indicated as ignorance. Each item on the nutrition knowledge questionnaire, for each participant, was labeled as ”knowledge” for a positive response or “ignorance” for preferring unhealthy food. Likewise, for the preference questionnaire, the three-item Likert-type scale represented the preferability to eat the food item, no preference, or unpreferability for the food item. A summation variable was also computed for nutrition related preference by mean operator, labeled “preferability” (see table 2). The mean value for the 9-item preferability scale was 2.82, SD 0.25. The minimum mean value was 1.89 and the maximum mean value was 3.0. The 6-item summation variable for unpreferability was also created (see table 2). The mean value was 1.46, SD 0.46. The minimum mean value was 1.0 and the maximum was 2.67.

Internal reliability was computed for the summative variable scales. The 9-item knowledge scale had a Cronbach alpha of 0.611, the 9-item preference scale had a Cronbach alpha of 0.311. The 6-item ignorance scale had a Cronbach alpha of 0.73 and the 6-item unpreferability scale had a Cronbach alpha of 0.890. In the knowledge and preference scales the ninth item, apple, was not included in computations by the SPSS program because the value was constant as all participants chose it as healthy and preferable.

	Mean (SD)	Minimum	Maximum
Preferability	2.82 (0.25)	1.89	3.00
Unpreferability	1.46 (0.46)	1.00	2.67
Knowledge	1.89 (0.12)	1.44	2.00
Ignorance	1.36 (0.39)	1.00	2.00

Table 2: Summation Variable Descriptive Statistics

3.6 Mann-Whitney U test

The small study size and abnormally distributed data necessitated the use of a nonparametric analysis. The IBM SPSS Version 22 program was used to compute the Mann-Whitney U test. Munro (2005, 122) explains that the Mann-Whitney U test can be used to compare two groups and the scores for the subjects are converted into ranks which are compared by mean in each group. In this study, the previously calculated summation variables of knowledge, ignorance, preferability or unpreferability, were compared between two groups of independent variables. P values were also computed to determine the significance of the means. Munro (2005, 93) explains that when testing for significance, it is important to know whether the difference in the relationship is so extreme or so far out in the tail of the distribution that it is unlikely to have occurred by chance, with a normal distribution, only 5% of the distribution falls beyond these two points. Munro (2005, 91) identifies ”p” value as the probability that differences between means could have happened by chance. In this study, p values were considered significant a level of greater than or equal to 0.050, which indicates that the probability of these mean differences occurring randomly are less than 5%.

4 Results

Using IBM SPSS analysis software, a mean for each summation variable was calculated. As described by Munro (2005,139) the difference between the calculated means indicates a difference in the summative variable within members of the independent variable groups. T-test were also calculated to confirm significance of the mean differences.

4.1 Nutrition related health knowledge of preschool children according to nationality, gender, BMI, and age

The Mann-Whitney U test indicated no statistically significant difference between Indian and Finnish participants in relation to knowledge of healthy food (p=0.394). There was a statistically significant difference between the nationalities in relation to ignorance, or identifying unhealthy food as healthy (p=0.032). The higher mean value of the Finnish participants (mean=1.5) compared to the lower mean value of Indian participants (mean=p=1.2) in ignorance indicates that the Finnish participants were less likely to identify an "unhealthy" food as "healthy". The weight groups showed no statistically significant difference in relation to knowledge (p=0.543) and ignorance (p=0.619) of healthy food. Likewise, there was no statistically significant difference in knowledge (p=0.088) and ignorance (p=0.070) between the 4-year-old and 5 and 6-year-old groups. There was also no statistically significant difference between knowledge (p=0.873) and ignorance (p=0.378) among the different genders (see table 3).

4.2 Nutrition related preferences of preschool children according to nationality, gender, BMI, and age

There was no statistically significant difference found between Indian and Finnish participants in the realm of preferability of nutritious foods (p=0.919) by the Mann-Whitely U test. However, a statistically significant difference between Indian and Finnish participants in the realm of unpreferability for healthy food (p=0.000) was found by the Mann-Whitney U test. The lower mean reported for the Finnish group indicates that Finnish participants had less preference for the unhealthy food than did the Indian participants. The underweight and normal weight group and the overweight and obese group showed no statistically significant difference in relation to preferability (p=0.519) and unpreferability (p=0.568) of healthy food. Likewise, there was no statistically significant difference between age groups in preferability (p=0.093) and unpreferability (p=0.066). There was no statistically significant difference between girls and boys in preferability (p=0.712) or unpreferability (p=0.887) of the food (see table 3). Throughout the groups, the relatively high mean for preferability, and the relatively low mean for unpreferability indicates a preference for healthy food.

	Mean (SD)	Statistical Significance of the MW-U test (p=)
Preferability		
Nationality: Finnish / Indian (n=20/23)	**2.8 (0.32)/2.9 (0.17)**	**NS***
Gender: Female / Male (n=27/16)	**2.8 (0.26)/2.8 (0.23)**	**NS***
BMI: Normal / Overweight (n=38/5)	**2.8 (0.24)/2.7 (0.36)**	**NS***
Age: 4 years / 5 and 6 years (n=13/30)	**2.9 (0.14)/2.8 (0.28)**	**NS***
Unpreferability		
Nationality: Finnish / Indian (n=20/23)	**1.2 (0.25)/1.7 (0.44)**	**0.000**
Gender: Male / Female (n=27/16)	**1.5 (0.46)/1.5 (0.47)**	**NS***
BMI: Normal / Overweight (n=38/5)	**1.4 (0.43)/1.6 (0.65)**	**NS***
Age: 4 years / 5 and 6 years (n=13/30)	**1.3 (0.49)/1.5 (0.44)**	**NS***
Knowledge		
Nationality: Finnish / Indian (n=20/23)	**1.9 (0.15)/1.9 (0.08)**	**NS***
Gender: Male / Female (n=27/16)	**1.9 (0.09)/1.9 (0.14)**	**NS***
BMI: Normal / Overweight (n=38/5)	**1.9 (0.12)/1.9 (0.06)**	**NS***
Age: 4 years / 5 and 6 years (n=13/30)	**1.9 (0.09)/1.9 (0.12)**	**NS***
Ignorance		
Nationality: Finnish / Indian (n=20/23)	**1.5 (0.43)/1.2 (0.29)**	**0.032**
Gender: Male / Female (n=27/16)	**1.4 (0.37)/1.3 (0.42)**	**NS***
BMI: Normal / Overweight (n=38/5)	**1.4 (0.38)/1.4 (0.45)**	**NS***
Age: 4 years / 5 and 6 years (n=13/30)	**1.2 (0.27)/1.4 (0.41)**	**NS***

*NS = statistically not significat at level $p \leq 0.05$

Table 3: Differences in knowledge, preferability, ignorance and unpreferability between nationality, gender, classified BMI and classified age

4.3 Relationship between knowledge and preference

Although the structure of the study and resulting data does not allow for correlation statistics between the knowledge and preference of preschool children towards nutritious food, there was evidence of high nutrition knowledge and preference for nutritious food. The preferability for healthy food was indicated by a mean of 2.82 (on a 3-point scale), SD of 0.25. The knowledge of nutritious food was indicated by a mean of 1.89 (on a 3-point scale), SD of 0.12 (see Table 2). Unfortunately, there was also a high level of ignorance (mean 1.36, SD 0.39 on

a 3-point scale) and unpreferability (mean 1.46, SD 0.46 on a 3-point scale) for healthy food. The overall higher mean reported for preferability and knowledge, on a 3-point scale, indicates a high level of knowledge of healthy food and high preference for healthy food. The overall lower mean reported for unpreferability and ignorance, on a 3-point scale, indicates less preference for unhealthy food and less ignorance regarding healthy food. The results indicate high knowledge among all groups, with more ignorance, relating to what food were unhealthy, among the Indian participants. High preference for healthy food is also demonstrated in all groups but a higher preference for unhealthy food is noted in the Indian group. Although a disconnect between knowledge and preference is apparent, especially among the Indian participants, a correlation cannot be confirmed with the current data. Further research is needed to understand the relationship between the knowledge and preference.

5 Evaluation of the project

According to Patton (2006, 30) developmental evaluation requires a long-term relationship between participants and evaluators involved in producing innovative ideas and solutions. FINDIgATE acknowledges the ongoing relationship between HEIs in Finland and India and the school children in these countries. The first steps in evaluation, to generate information and provide feedback to support potential changes (Patton, 2006, 30) are met by the current study. This project also meets the other requirements outlined by Patton (2006, 30) such as having a multidisciplinary team with ongoing interpretation of results, a sense of values and collaboration in the effort to design new monitoring systems as new information arrives. This study contributes to the developmental evaluation requirement (Patton, 2006, 30) that generalizable findings are needed to produce relevant information to help create innovations and improvements in the future. An abstract for this project was part of a Poster Presentation at the COHEHRE Conference in April 2017 in Setúbal, Portugal (see Appendix 6). The theme of the conference was Educational Implications of Globalisation and Global Citizenship. The results and outcomes of FINDIgATE will be an increase in children's wellbeing.

5.1 Ethical and legal considerations

Studies involving human subjects require special ethical considerations. Additionally, studies involving children must be cognizant of special ethical and legal issues. This study made every effort to protect legal rights and respect the ethical issues of this population.

5.1.1 Informed consent

All the principles outlined in the World Medical Association Declaration of Helsinki-Ethical Principles for Medical Research involving Human Subjects (2013), have been followed in the current study. Prior to data collection in India, the University of Loyola reviewed the project plans submitted and granted permission for our participation. In India, interviews were performed, and data collected under the auspices of the Social Work department at Loyola College which had previous agreements with participating preschools. In Finland, several weeks prior to visiting the school permission was granted by the administrators and teachers. A letter of introduction and consent form was distributed to the children's' parents by the teachers. These were returned by the parents and were available on the day of the interviews. Prior to completion of the questionnaires, all participants gave verbal consent.

5.1.2 Ethical considerations with children

Per Uusiautti and Määttä (2013, 61), a child's privacy and development must be protected, and the interview must be simple and non-stressful for the child. Efforts were made to present the pictorial tool in a fun manner to tried to lessen the stress as the children are not required to talk and can merely point to their response.

The association between poor nutrition and poor school performance is a phenomenon with long lasting consequences and is concerning for its impact on poor or underserved populations. It is important, regardless of the barriers to perform research on children. The need to study and validate these results as well as implement programs and policies that create equity in nutrition of preschool children will also create equity in future success of children.

5.2 Practical applications of findings

The WHO Commission on Ending Childhood Obesity (2017) recommends choosing healthy food for infants and young children because food preferences are established early in life and might positively impact future choices. These recommendations are very general, and the current study seeks to establish if young children can use self-determination in choosing healthy food or is guidance necessary throughout the pre-operational stage of life. The FINDIgATE project can take examples from other projects such as the North Karelia project for future implementation of discoveries. According Puska et al. (2009) the North Karelia project implemented practical changes such as working with food manufacturers, legislation, information exchange and advertising to improve food choices. The purpose of this work has been to help people choose healthy foods, increase healthfulness and subsequently decrease noncommunicable diseases. As a result of the collaboration between institutes of higher education in India and Finland investigators could access and understand situations that would have been difficult without collaboration. Additionally, the multidisciplinary team of

FINDIgATE allowed for the open exchange of ideas regarding future implementation of education and development of tools based on the project results. The assistance of senior colleagues in developing the project eliminated many possible problems and allowed for open discussion and planning. As a nurse with 16 years of experience with pediatric patients, I have seen first-hand the consequences of poor decisions relating to health and nutrition. Health care providers have an obligation to educate children and their guardians on the importance of nutrition and healthy eating habits.

5.3 Limitations of data collection, analysis and reporting

Although every effort was made to assure quality during each step of the study, the design of this study creates several potential limitations. To begin with, the questionnaire type used to access the pre-operational, multi-national subjects does not have previously identified examples in literature. Although, independently, pictorial questionnaires, questionnaires with a three-point Likert-type scale and facial Likert-type scales have been used, no prior use of this unique combination has been located.

Another limitation with the current study is the many other factors involved in nutrition and healthy diet. The findings of this study support the current education of pre-operational children in nutritional knowledge. Uusiautti and Määttä (2013, 63) state that the reliability of the information from children is often questioned because of the developmental stage of the children and doubt as to whether the children's speech is reliable. The structure of the study and the use of our pictorial tool and visual analog scale was meant to eliminate many of these doubts.

Zeinstra, Koelen, Kok and de Graaf (2007) found that children in the pre-operational stage can label foods as healthy or unhealthy, but cannot explain why. This early education can be beneficial in the future when it is applicable. However, the associated preference toward nutritious food indicates that although knowledgeable about nutrition, this does not always impact food choices. This was also demonstrated in older children, aged seven to twelve in a study by Heard et al. (2016). Both examples show that although children can accurately identify healthfulness of foods this knowledge may not predict healthy preferences. According to Fautsch Macías and Glasauer (2014), other factors also impact preferences and food choice such as food availability, family, culture, finances and marketing. These studies support the results in the current study which suggests that knowledge alone is unlikely to improve children's diet. Other interventions such as offering of only healthy options and guardian nutrition education is important. It is important to continue to provide health and nutrition education at young ages but also provide adult supervision.

Another limitation is the instability of preferences which may not be stable over time and may change depending on the interviewing situation. The questionnaires are based on self-reported answers and not objective measurements which are changeable. It is therefore not possible to validate the results concerning knowledge and preference because no objective benchmark or reference exists.

A major limitation in this study was the differences in the language of the participants and the investigator. To limit the language conflicts, a quantitative approach was used. Qualitative methods would allow for further exploration of the results obtained by this study and may generate a more in-depth understanding of the issues identified.

A final limitation is the assumption of choice by informants. Finnish schools offer a diverse lunch menu with both meat and vegetarian options. Additionally, children in Finnish schools can serve themselves and thereby dictate the proportions of each food and types taken. The Indian children, specifically those preschool students in the state run Anganwadi centers, were provided a very processed "complementary food" that contained various flours, powdered jaggery, calcium, iron and other ingredients. In many pre-schools we visited, the daily morning meal consisted of this complementary food which provided all the vitamins, micronutrients and calories required however, no choice was involved. Likewise, with other meals the Indian children were served specific foods to eat and were not given a variety to choose from and did not serve themselves. These practices do not allow children the choice and opportunity to apply knowledge. It is vital that the adults and guardians who are responsible for the children who are making the choices have a solid education and understanding of nutrition. The Indian government (2014) has instituted one such initiative, a program called Sneha Shivir at local Anganwadi centers. This program uses a twelve-day session to educate women about nutrition and food safety. These types of education seminars will enhance the nutrition of the participants as well as their families. The benefits of early health education will reach fruition in adolescence and adult hood when self-control eclipses desire. In the future, these factors can then be considered in the design of the project or intervention by, for instance, identifying other strategies to be pursued, such as influencing nutrition policies or changing the food environment.

6 Conclusion

As discussed in section 4.3, there is an overall high knowledge of healthy food and high preference for healthy food among all groups. However, there is also a mis-identification of "unhealthy" food items as "healthy" by the Indian participants. Likewise, the data indicated a higher preference for "unhealthy" food items by the Indian participants. This could be a direct results of the higher "ignorance" or could indicate that knowledge does not impact pref-

erence. These results indicate that knowledge did not always result in healthy preferences among the participants. Further research is needed to identify causes of the unpreferability and ignorance. However, the data supports continued focus on education and guidance in nutrition. This study can be used to support the inclusion of health and nutrition education at early stages, such as preschool. The results of this study can also be used to create policies which encourage healthy food preferences such as children's involvement in food choices, and continued nutrition education among children and caretakers. The possibility that children of this age are not able to use their knowledge to make healthy choices should be considered. The results of higher "unpreferability" among Indian participants could be a result of this phenomenom. However, additional research is needed to understand the relationship. Providing guidance and limiting choices to healthy options among preschool children is suggested. For example, the elimination of vending machines or food stalls which offer unhealthy food is a safe solution.

It is hopeful that this study can be used by other disciplines, such as the technology and education sectors to develop nutrition and health teaching tools for children and caregivers. Likewise, qualitative research could be helpful in understanding the causal relationships between knowledge and prefence indicated by this study. As a pilot project, FINDIgATE is just beginning to develop the relationship between institutes of higher education in India and Finland. Likewise, the long-term plans of the project are in development. It is hopeful that the results of this study will be shared among the participants and will be used to develop policies and tools within the education system to improve the wellbeing of children.

References

Baker, D. 2006. The meaning and the measure of health literacy. Journal of General Internal Medicine, 21 (18), 878-883.

Barker, J. & Weller, S. 2003. "Is it fun?" Developing children centered research methods. The International Journal of Sociology and Social Policy, 23 (1/2), 33-58.

Birkenhead, K. & Slater, G. 2015. A review of factors influencing athletes' food choices. Sports Medicine, 45, 1511–1522.

Blogspot.com. 2016. 3-point Facial Likert-type Scale. Accessed 22 November 2016. https://1.bp.blogspot.com/_Jrt9PxI8-F4/RzoOVmpxCZI/AAAAAAAAAm0/qTY7r4yLMCk/s400/smileys001.jpg)

Centers for Disease Control and Prevention. 2012. Higher education and income levels keys to better health, according to annual report on nations health. Accessed 12 December 2016. http://www.cdc.gov/medica/releass/2012/p0516_higher_education.html

Centers for Disease Control and Prevention. 2016. Defining Childhood Obesity. Accessed 3 March 2017. https://www.cdc.gov/obesity/childhood/defining.html

Centers for Disease Control and Prevention. 2017. BMI Percentile Calculator for Child and Teen. Accessed 3 March 2017. https://nccd.cdc.gov/dnpabmi/Calculator.aspx

Elementary Education Mid-Day Meal Scheme. 2016. Department of School Education and Literacy, Ministry of Human Resource Development, Government of India. Accessed 28 November 2016. http://mhrd.gov.in/mid-day-meal

Erikson, E. 1994. Identity and the Life Cycle. Reissued. New York: Norton.

Fautsch Macías, Y. & Glasauer, P. 2014. Guidelines for assessing nutrition-related knowledge, attitudes and practices - KAP Manual. Nutrition Division Food and Agriculture Organization of the United Nations, Rome. Accessed 12 September 2017. http://www.fao.org/docrep/019/i3545e/i3545e.pdf

Food and Agricultural Organizations of the United Nations. 2016. Food-based dietary guidelines – Finland. Accessed 15 November 2016. http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/finland/en/

Food and Agricultural Organizations of the United Nations. 2016. Food-based dietary guidelines – India. Accessed 15 November 2016. http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/india/en/

Government of India Food & Nutrition Board, Ministry of Women & Child Development Accessed 21 September 2017. http://wcd.nic.in/fnb/fnb/index.htm

Grove, S., Burns, N. & Gray, J. 2013. The Practice of Nursing Research. St Louis: Elsevier Saunders.

Heard, A., Harris, J., Lui, S., Schwartz, M. & Li, X. 2016. Piloting an Online Grocery Store Simulation to Assess Children's Food Choices, Appetite, 96 (2016), 260-267.

Helsinki population continued strong growth in 2015. 2016. City of Helsinki. Accessed 8 October 2017.
https://www.hel.fi/uutiset/en/helsinki/population-growth

India. 2015. The Constitution of India. Article 47. Accessed 30 August 2017.
http://lawmin.nic.in/olwing/coi/coi-english/coi-4March2016.pdf

Kubacki, K., Rundle-Thiele, S., Lahtinen, V. & Parkinson, J. 2015. A systematic review assessing the extent of social marketing principle use in interventions targeting children (2000-2014). Young Consumers, 16 (2), 141-158.

Ministry of Housing and Urban Affairs. Government of India. Smart Cities Mission- Chennai. 2016. Accessed 23 November 2016.
http://smartcities.gov.in/writereaddata/CitiesProfile/TamilNadu_Chennai.pdf
http://www.hel.fi/www/uutiset/en/tietokeskus/helsinki-population-continued-strong-growth-in-2015

Munro, B. 2005. Statistical Methods for Health Care Research. 5th ed. Philadelphia: Lippincott Williams & Wilkins.

National Institute of Nutrition. 2011. Dietary Guidelines for Indians. Accessed 28 November 2016.
http://ninindia.org/dietaryguidelinesforninwebsite.pdf

Nordic Council of Ministers. 2012. Nordic Nutrition Recommendations 2012. Accessed 28 November 2016.
https://www.norden.org/en/theme/nordic-nutrition-recommendation/nordic-nutrition-recommendations-2012

Nyaradi, A., Li, J., Foster, J., Hickling, S., Jacques, A., O'Sullivan, T. & Oddy, W. 2016. Good-quality Diet in the Early Years May Have a Positive Effect on Academic Achievement. Acta Paediatrica, 105 (5), e209.

Ogden, C., Carrol, M., Kit, B. & Flegal, K. 2012. Prevalence of obesity in the United States, 2009-2010. National Center for Health Statistics Data Brief 82. Hyattsville, MD: National Center for Health Statistics. Accessed 23 August 2017.
https://stacks.cdc.gov/view/cdc/11838

Ogden, C., Carroll, M, Kit, B. & Flegal, K. 2014. Prevalence of childhood and adult obesity in the United States, 2011-2012. The Journal of the American Medical Association, 11 (8), 806-814.

Owen, S., Schickler, P. & Davies, J. 1997. Food Choice: How to Assess Attitudes of Pre-adolescent Children. Nutrition & Food Science, 97 (1), 5-11.

Parmenter, K. & Wardle, J. 2000. Evaluation and Design of Nutrition Knowledge Measures. Journal of Nutrition Education, 32 (5), 269-277.

Patton, M. 2006. Evaluation for the Way We Work. The Nonprofit Quarterly, 13 (1), 28-33. Accessed 23 October 2017.
http://www.scribd.com/doc/8233067/Michael-Quinn-Patton-Developmental-Evaluation-2006

Patton, M. 2015. Qualitative research & evaluation methods: Integrating theory and practice. Fourth edition. Thousand Oaks, California: SAGE Publications, Inc.

Piaget, J. & Inhelder, B. 1969. The psychology of the child. Vol. 5001. Basic books. New York. Accessed 20 August 2017.

https://www.slideshare.net/tajae66/download-the-psychology-of-the-child-jean-piaget-ebook-online

Pollard, E. & Lee, P. 2003. Child Well-being: A Systematic Review of the Literature. Social Indicators Research, 61 (1), 59.

Position of the Academy of Nutrition and Dietetics: The Role of Nutrition in Health Promotion and Chronic Disease Prevention. 2013. Journal of the Academy of Nutrition and Dietetics, 113 (7), 972. Accessed 23 August 2017.
http://www.eatrightpro.org/~/media/eatrightpro%20files/practice/position%20and%20practice%20papers/practice%20papers/hpdp%20practice%20paper.ashx

Preference. 2017. Merriam Webster Dictionary. Accessed 11 November 2017.
https://www.merriam-webster.com/dictionary/preference

Press Information Bureau Government of India. 2014. Ministry of Women and Child Development. The Government programme to tackle malnutrition among children and women now on a mission mode. Accessed 28 September 2017.
http://pib.nic.in/newsite/PrintRelease.aspx?relid=112666

Puska, P., Vartiainen, E., Laatikainen, T., Jousilahti, P. & Paavola, M. 2009.The North Karelia Project: From North Karelia to National Action. Helsinki: National Institute for Health and Welfare.

Schmidt, C., Fahland, R., Franze, R., Splieth, C., Thyrian, J., Plachta-Danielzik, S., Hoffman, W. & Khomann, T. 2010. Health-related behaviour, knowledge, attitudes, communication and social status in school children in Eastern Germany. Health Education Research, 25 (4), 542-551.

School Meals in Finland, Investment in Learning. 2008. Finnish National Board of Education. Accessed 28 November 2016.
http://www.oph.fi/download/47657_school_meals_in_finland.pdf

Schües, C. & Rehmann-Sutter, C. 2013. The Well- and Unwell-Being of a Child. Topoi, 32 (2), 197-205.

The world health report 2002: reducing risks, promoting healthy life. Geneva, World Health Organization. Accessed 12 December 2016.
http://www.who.int/whr/2002/en/whr02_en.pdf?ua=1

United Nations Human Rights- Office of the High Commissioner. 1990. Article 24 of the Convention on the Rights of the Child. Accessed 20 September 2017.
http://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx

Uusiautti, S., & Määttä, K. 2013. How to Study Children? Methodological Solutions of Childhood Research. Rovaniemi: Lapland University Press.

World Health Organisation Staff. 2003. Diet, Nutrition and the Prevention of Chronic Diseases: Report of a Joint WHO/FAO Expert Consultation. Geneva: World Health Organization. Accessed 12 December 2016.
http://apps.who.int/iris/bitstream/10665/42665/1/WHO_TRS_916.pdf

WHO Nutrition -friendly schools initiative (NFSI). Accessed 30 July 2017.
http://www.who.int/nutrition/topics/nutrition_friendly_schools_initiative/en/

WHO Fact Sheet on Obesity and overweight. June 2016. Accessed 30 July 2017.
http://www.who.int/mediacentre/factsheets/fs311/en/

WHO Commission on Ending Childhood obesity. Facts and figures on childhood obesity Accessed 3o July 2017.
http://www.who.int/end-childhood-obesity/en/

WHO Global Action plan for the prevention and control of NCDs 2013-2020. Accessed 30 July 2017.
http://www.who.int/nmh/events/ncd_action_plan/en/

World Medical Association Declaration of Helsinki-Ethical Principles for Medical Research involving Human Subjects. 2013. 64th World Medical Association General Assembly, Fortaleza, Brazil. Accessed 27 November 2016.
https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/

Zeinstra, G., Koelen, M., Kok, F. & de Graaf, C. 2007. Cognitive development and children's perceptions of fruit and vegetables; a qualitative study. International Journal of Behavioral Nutrition and Physical Activity, 4, 30.

Figures

Tables

Appendices

Appendix 1: Finnish Questionnaire

Nutrition Related Health Knowledge and Nutrition Preference Tool (Finnish)

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Appendix 2: Indian Questionnaire

Nutrition Related Health Knowledge and Nutrition Preference Tool (Indian)

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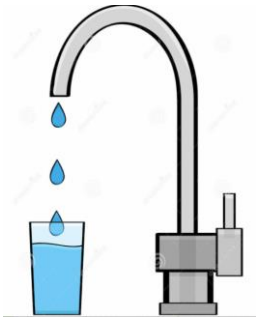

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Appendix 3

Parent/Guardian Informed Consent

Identification of Investigators & Purpose of Study

Your child is being asked to participate in a research study conducted by Amanda Talmadge from Laurea University of Applied Sciences. The purpose of this study is to assess nutrition related health knowledge and attitudes of Finnish and Indian pre-school children. This study will contribute to the researcher's completion of master's thesis.

Research Procedures

Should you decide to allow your child to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of an interview that will be administered to individual participants in their preschool classroom. Your child will be asked to provide their opinions in a series of questions related to food. In addition, a height and weight will be measured on each child.

Time Required

Participation in this study will require 15 minutes of your/your child's time.

Risks

The investigator does not perceive more than minimal risks from your child's involvement in this study (that is, no risks beyond the risks associated with everyday life).

Payment for participation

There is no payment for taking part in the study.

Confidentiality

Your child will be identified in the research records by a number. The researcher retains the right to use and publish non-identifiable data. When the results of this research are published, or discussed in conferences, no information will be included that would reveal your child's identity. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that matches up individual respondents with their answers will be destroyed.

There is one exception to confidentiality we need to make you aware of. In certain research studies, it is our ethical responsibility to report situations of child abuse, child neglect, or any life-threatening situation to appropriate authorities. However, we are not seeking this type of information in our study nor will you be asked questions about these issues.

Additional Information Required

If you choose to allow your children to participate in this study, additional information will be required as listed below.

Does your child have any food restrictions such as a special diet?

Does your child have any food allergies?

Participation & Withdrawal

Your child's participation is entirely voluntary. He/she is free to choose not to participate. Should you and your child choose to participate, he/she can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your child's participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

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Laurea UAS
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Laurea UAS
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Giving of Consent

I have read this consent form and I understand what is being requested of my child as a participant in this study. I freely consent for my child to participate. I have been given satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

_____
Name of Child (Printed)

_____
Name of Parent/Guardian (Printed)

_____ _____
Name of Parent/Guardian (Signed) Date

_____ _____
Name of Researcher (Signed) Date

Appendix 4: Letter to Parents
Helsinki – Finland, 24, January 2017

Dear Parents,

My name is Amanda Talmadge. I am a Master's degree student at Laurea University of Applied Sciences. I have been a nurse for 15 years and am interested in children's health.
I will, with permission of your child's school, be visiting in the coming weeks. My intention is to interview children to understand their knowledge of, and their attitudes towards, nutritious food.
These activities will take place at your child's school and are part of my thesis studies. These same activities have been conducted in several preschools in Chennai, India earlier this month. I will ask the children to give their opinions on the healthfulness of different foods, presented as pictures, as well as their desire to eat certain foods, also presented as pictures. This should be a fun and low stress task for the children. I am only interested in their opinions and attitudes.
Once agreement from parents is received, by signing the attached consent, the children will also be asked to participate voluntarily. In the case that the child or the parents do not want to participate, the children will be involved in alternative activities with their teachers.
If you would like to hear more about the activities for the children, I would be very happy to answer your questions during my free time at the school.
I would like to thank you in advance for your collaboration in allowing your child to take part in these activities.

Warm regards,

Amanda Talmadge
Student of Master's Degree in Global Development and Health Care

Appendix 5: FINDIgATE Project Plan

FINDIgATE Description- Finnish and Indian Wellbeing through Education sponsored by Laurea University of Applied Sciences

The main idea of FINDIgATE project is to co-create a joint online course between HEIs´ in India and Finland. It is a pilot project which aim is to view how children's educational systems work in India and Finland and how they improve wellbeing. The aims of the joint course are to compare systems which are related to education and wellbeing in both countries. Goals are also to collect best practices in Finnish and Indian preschool and primary school systems including its impact on wellbeing and to prepare models from good practices and those models will be piloted during student's' thesis process in Indian and Finland ecosystems. Another goal is to identify collaboration initiatives that align common interest of partners from Finland and India. The results of FINDIgATE will be the starting point for the future´s cooperation with partner HEIs involved to the project.

Appendix 6: COHEHRE conference poster

Choice or Chance? Nutrition Knowledge and Attitudes of Finnish and Indian Preschool Children

AMANDA TALMADGE
Laurea University of Applied Sciences

Do Pre-School Children, ages 4 to 6, consider Nutritional Knowledge when making food choices?

BACKGROUND

Nutrition Literacy in adults has been shown to have a significant impact on food choices and overall health. Preschool presents an opportunity for pre-operational children to make independent food choices and learn about nutrition. The objectives of this study were to determine the level of nutrition related health knowledge of preschool children and to determine the nutrition related health attitudes of preschool children. This study was a conducted within the FINDIgATE project which examined the well-being of children in the school systems of Finland and India. The field research was conducted in India in January of 2017 and in Finland in February of 2017. The sample size of 44 pre-school children contained 89% normal or underweight children and 11% of overweight or obese children, 45% of the children were Finnish and 54% were Indian. All participants were between the ages of 4 and 6years 11months with 57% being 5 years old and 64% of the participants were female and 36% were male.

TOOLS

Two, 15-Question Pictorial Questionnaires utilizing Likert Scale answers were developed and validated with a Cronbach alpha of 0.74. The questionnaires were used to determine the level of nutrition knowledge as well as the attituded toward nutritious food. The pictorial scale was necessary for the pre-operation subjects who were unable to read and also for the multiple language barriers presented by this binational study.

RESULTS

Differences between Attitude and Knowledge of Healthy Foods

N=44	Attitude to Healthy Food Mean	Attitude to Unhealthy Food Mean	Knowledge of Healthy Food Mean	Ignorance of Healthy Food Mean
Gender				
Female	2,82	1,45	1,90	1,38
Male	2,84	1,47	1,88	1,32
Nationality				
Finnish	2,78	1,15	1,90	1,50
Indian	2,85	1,70	1,89	1,23

In both Finnish and Indian participants the preference for healthy food is higher than the knowledge of healthy food. This appears to indicate that the participants have a preference for healthy food unrelated to their knowledge. The children are choosing healthy food by chance and not based on healthfulness. Conversely, the preference for unhealthy food is higher in Indian participants as is the level of ignorance in relation to unhealthy food.

CONCLUSION

There is a high level of nutrition knowledge among children ages 4 to 6 and a high level of healthy food preference. However, this knowledge does not appear to impact the food choices. This information supports continued need for teachers and parents influence in pre-school children's diet. Children should be offered healthy food and nutritional information. It should not be expected that pre-operational children will use nutritional knowledge to make the most nutritious choices.

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