

Teachers' self-efficacy is related to their nutrition teaching methods

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Summary. *Background:* Teacher-led nutrition education is a practical method for informing children about healthy eating at an early age. Commonly reported teacher barriers include self-efficacy and use of teaching methods. *Objective:* This study is the first to evaluate preschool teachers' self-efficacy in teaching nutrition and their preferred teaching methods. *Material and Method:* Researchers recruited preschool teachers from 133 preschools in Konya. At the baseline, teachers were asked to provide demographic information, including their age, sex, level of education, teaching experience, previous involvement in teaching nutrition and resources used to plan nutrition lessons. The completed survey data were entered into SPSS 24. The data were analysed using descriptive statistical methods, and each question was analysed for frequencies. Kendall's Tau-b was used throughout the analysis to determine the relationships among the variables (self-efficacy and teaching methods). *Results:* All of the teachers were female. The baseline score for self-efficacy was relatively high, with an average of 74 ± 65.6 . Teachers who demonstrated decreases in self-efficacy were those who reported previous experience teaching nutrition, and those who showed increases in self-efficacy were those who reported no previous experience teaching nutrition. Kendall's Tau-b showed a statistically significant relationship between self-efficacy and teaching method and indicated a statistically significant relationship between the belief that teachers are doing a good job regarding the health of students and role playing, 0.194 ($p < 0.05$). Teachers believe that students' engagement in regular physical activity and preference for well-balanced meals increased with increased numbers of field trips (Kendall Tau b 0.260 and 0.245 respectively). *Conclusions:* The study investigates teachers' self-efficacy in teaching nutrition and preferred methods of teaching nutrition. Role-playing, field trips and project-based learning methods of nutrition teaching are directly related to teachers' self-efficacy. This study provides information for teachers on how to improve their nutrition education efforts for the benefit of students. Teachers' self-efficacy and teaching methods for preschool children's nutrition education may have profound effects on the implementation of a nutrition education programme.

Key words: preschool teachers, self-efficacy, nutrition, nutrition education, teaching methods, role-playing, field trips, project-based learning, Kendall's Tau-b, questionnaire

Introduction

Nutrition is a key component of mental development, mood alteration, behaviour and physical activity. Children's general nutritional habits also affect teachers' teaching methods and self-efficacy. Obesity is a major and widespread public health problem throughout the world, and has substantial medical psychosocial and eco-

nomical consequences. The prevalence of overweight and obesity has increased in the last two decades. For example, preschool obesity has become an important and alarming health issue in Turkey. An effective way to prevent childhood overweight and its consequences while maintaining adequate nutrition in later life is to promote and establish healthy eating behaviours and increased physical activity early in life (1). Many of the health-related attitudes and

behaviours developed at preschool ages are maintained throughout life and may have profound effects on chronic disease risk later in life. Food nutrition is also crucial for a child's normal growth and development. Healthy food choices thus contribute to academic success in addition to providing a foundation for good health.

There are no systematic national studies on the prevalence and trends of overweight and obesity in Turkish children. Studies have highlighted that body weight prior to 5 years of age is a significant predictor of health at older ages (2). The Turkish Ministry of Health addresses fighting overweight and obesity, and the Department of Obesity, Diabetes and Metabolic Diseases and the Head Office of Health Promotion have implemented policies such as, 'Turkey Nutrition Guide', 'Turkey Nutrition and Physical Activity Pyramid with Healthy Food Plate' and 'Movement to Combat Obesity'. The policies of the Ministry focus on nutrition attitudes and behaviour, and physical activities. A number of projects target children, such as, 'School Milk Program', 'Nutrition Friendly Schools Program' 'Control of School Canteens and Hygiene Rules to Conform' and 'Nutrition Recommendations and Menu Programs for Preschool and School Age Children'.

Obesity is a major problem among pre-school children in Turkey, 11 % of children under 5 years of age are overweight/obese (3) and later a recent research by Santas and Santas (4) showed that obesity is a major problem among pre-school children in Turkey: 8.6% of pre-school children are overweight and/or obese by height and 6.6% are overweight and/or obese by age. This finding demonstrates that effective interventions regarding obesity in Turkey should begin as early as infancy. Due to the complexities of individual, social and environmental factors on children's dietary choices, nutrition interventions often use theoretical models of behaviour change as frameworks to develop nutrition education interventions (5). Of the many models of behaviour change, social cognitive theory (SCT) has been most widely used in school-based interventions (6). One of the primary constructs of SCT is self-efficacy – a person's perceived ability to perform desired behaviours.

Schools can serve as an excellent vehicle for disseminating health and nutrition information. Individual teacher characteristics such as education, training and skills also play considerable roles in how teachers

behave in the classroom. While nutrition is not a part of traditional preschool teacher training programmes, teacher-led nutrition education can potentially encourage children to adopt healthful eating practices in a supportive school environment. School-based nutrition education intervention has the potential to improve children's dietary behaviours (7), and the implementation of nutrition curricula in schools can be influenced by preschool teachers' self-efficacy and methods of teaching nutrition (8). Self-efficacy refers to beliefs in teacher's capabilities to organise and execute the courses of action vital to produce the given attainment (9). Teachers' perceived self-efficacy is supposed to affect behaviour in several ways. Perceived efficacy affects the choices that individuals make and the courses of action that they follow. Individuals tend to engage in tasks in which they feel skilled and avoid those in which they do not. Self-beliefs determine how much effort people will expend on an activity, how long they will persist when encountering obstacles and their resilience in the face of opposition. As teachers' efficacy increases, their effort, persistence and flexibility also increase. Pajares and Schunk (10) noted that efficacy beliefs influence thought patterns and emotional responses. Teachers with low self-efficacy may underestimate their abilities, which can foster stress, depression and less creativity in problem solving. In contrast, teachers with high self-efficacy are likely to feel calmer in approaching difficult tasks and activities.

Teacher-led nutrition education is a practical method for informing children about healthy eating at an early age. Commonly reported teacher barriers include self-efficacy and use of teaching methods. This study is the first to evaluate teachers' self-efficacy in teaching nutrition and their preferred teaching methods.

Material and methods

Research Group

Researchers recruited preschool teachers from 133 preschools in Karatay, Konya at the beginning of the 2016 academic year. At the baseline, teachers were asked to provide demographic information, including their age, sex, level of education, teaching experience, previous involvement in teaching nutrition and resour-

es used to plan nutrition lessons. The researcher interviewed the Ministry of Education of Konya Karatay district to obtain information about nutrition education programmes implemented by teachers enrolled in this study. Meetings were conducted at the university at which the researcher was working during normal school hours. During the introductory meeting, the researcher presented the study's goals, methods and expectations.

Study Instrument

Section one explores the self-efficacy of teaching nutrition using a questionnaire that was administered before the preliminary meeting and after the completion of the preschool nutrition education curriculum. This questionnaire was revised from an earlier published and validated survey measuring self-efficacy in

the teaching of health education (11). Fifteen questions relevant to nutrition education were chosen. Answer choices were provided using a five-point Likert scale (strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, and strongly agree). Section two explores the methods that teachers use to present nutrition information and the extent to which nutrition education is integrated with other subject areas.

Statistical Analysis

The completed survey data were entered into SPSS 24. A professional statistician worked with the researcher to check data for errors. The data were analysed using descriptive statistical methods, and each question was analysed for frequencies (percentages or distributions). Kendall's Tau-b was used throughout

Table 1. Teachers' self efficacy of teaching nutrition

Self Efficacy	Strongly Disagree n (%)	Somewhat Disagree n (%)	Neither agree nor disagree n (%)	Somewhat Agree n (%)	Strongly Agree n (%)
I believe I can do a good job teaching students about health	2(6.1)	1(3)	-	2(6.1)	28(84.8)
I believe I can do a good job teaching students about nutrition	2(6.1)	-	-	2(6.1)	29(87.9)
I understand nutrition concepts well enough to be effective in teaching elementary nutrition education	1(3)	-	1(3)	4(12.1)	27(81.8)
I am able to stimulate students enough so they ask thoughtful questions about nutrition	2(6.1)	-	1(3)	4(12.1)	26(78.8)
I believe I can do a good job teaching student about physical activity	1(3)	2(6.1)	1(3)	1(3)	28(84.8)
Even if I try hard, I will not teach about nutrition as well as I will most other subjects	16(48.5)	7(21.2)	1(3)	4(12.1)	5(15.2)
I believe I can do a good job teaching student about nutrients	2(6.1)	2(6.1)	1(3)	2(6.1)	26(78.8)
I believe I can do a good job teaching student about recommendations for a healthy diet	1(3)	3(9.1)			29(87.9)
I believe if I do a good job teaching, the students I teach will be more knowledgeable about nutrition and health	2(6.1)	-	1(3)	2(6.1)	28(84.8)
Increased teaching time in nutrition produces significant changes in nutrition related behaviours of many students	1(3)	-		8(24.2)	24(72.7)
I believe that if I do a good job teaching, the students I teach will be more likely to engage in regular physical activity	1(3)	-	3(9.1)	2(6.1)	27(81.8)
I believe that if I do a good job teaching, the students I teach will be more likely to eat well-balanced meals	2(6.1)	2(6.1)	2(6.1)	5(15.2)	22(66.7)
I believe that if I do a good job teaching, the students I teach will be more likely to maintain a normal weight	3(9.1)		7(21.2)	8(24.2)	15(45.5)
I believe that if I do a good job teaching, the students I teach will be more knowledgeable about nutrients	1(3)		2(6.1)	9(27.3)	21(63.6)
I believe that if I do a good job teaching, the students I teach will be more knowledgeable about recommendations for a healthy diet	2(6.1)	2(6.1)	2(6.1)	10(30.3)	17(51.5)

the analysis to determine the relationships among the variables (self-efficacy and teaching methods).

Results

All of the teachers were female (male preschool teachers are very rare in Turkey); none had earned Master's degrees. The baseline score for self-efficacy was relatively high, with an average of 74 ± 65.6 . There were no significant differences in the change in self-efficacy between schools. Teachers who demonstrated decreases in self-efficacy were those who reported previous experience teaching nutrition, and those who showed increases in self-efficacy were those who reported no previous experience teaching nutrition (Table 1).

When asked about methods used to teach nutrition, teachers most often reported the use of demonstrations (97%) (Table 2). Guest speakers (84.8%), role

playing (78.8%), field trips (72.7%), student projects (66.7%), collaborative work (51.5%) and hands-on learning (54.5%) were also used. Teachers in this study reported comparatively more limited use of lecturing, active classroom discussions and computers.

Kendall's Tau-b showed a statistically significant relationship between self-efficacy and teaching method (Table 3) and indicated a statistically significant relationship between the belief that teachers are doing a good job regarding the health of students and role playing, 0.194 ($p < 0.05$). As the use of role playing as a preferred teaching method increased, so did the belief that teachers are doing a good job regarding the health of the students.

Teachers believe that students' engagement in regular physical activity and preference for well-balanced meals increased with increased numbers of field trips (Kendall Tau b 0.260 and 0.245 respectively). Additionally, teachers believe that increased project-

Table 2. Methods used by teachers to teach nutrition

Instruction method	Very Poor n (%)	Below Average n (%)	Average n (%)	Above Average n (%)	Excellent n (%)
Role playing	2(6.1)	-	1(3)	3(9.1)	26(78.8)
Lecturing	2(6.1)	14(42.4)	-	11(33.3)	5(15.2)
Active classroom discussion	2(6.1)	1(3)	2(6.1)	15(45.5)	12(36.4)
Guest speaker	4(12.1)	-	-	-	28(84.8)
Field trips	-	-	2(6.1)	6(18.2)	24(72.7)
Project based learning	1(3)	1(3)	-	8(24.2)	22(66.7)
Collaborative work	1(3)	5(15.2)	-	9(27.3)	17(51.5)
Computers	2(6.1)	-	3(9.1)	16(48.5)	11(33.3)
Hands on learning	2(6.1)	1(3)	-	11(33.3)	18(54.5)
Demonstrations	1(3)	7(21.2)	-	24(72.7)	32(97)

Table 3. Relationship between self efficacy and teaching method

Self-efficacy and teaching method	Kendall's tau b	p
I believe I can do a good job teaching student about health - Role playing	0.194	0.042*
I believe that if I do a good job teaching, the students I teach will be more likely to engage in regular physical activity - Field trips	0.260	0.014*
I believe that if I do a good job teaching, the students I teach will be more likely to eat well balanced meals - Field trips	0.245	0.049*
I believe if I do a good job teaching, the students I teach will be more knowledgeable about nutrition and health - Project based learning	0.272	0.017*
Increased teaching time in nutrition produces significant changes in nutrition related behaviours of many students - Project based learning	0.270	0.047*
I am able to stimulate students enough so they ask thoughtful questions about nutrition - Project based learning	0.033	0.004*

*($p < 0,05$)

based learning resulted in increases in students' knowledge about nutrition and health, significant changes in nutrition-related behaviours and more questions from students about nutrition.

Discussion and Conclusions

The study investigates teachers' self-efficacy in teaching nutrition and preferred methods of teaching nutrition. Preschool teachers play a significant role in developing children's knowledge and skills to enable them to make informed, healthful choices about their diet (12, 13). Role-playing could also bring about better and deeper effects on nutrition by actively engaging preschoolers in educational sessions (14).

Teachers play a very important role in designing and organising trips to out-of-school environments to promote education, and they have to invest a great deal of time and effort in planning successful school trips (15). It is therefore important to train self-confident and well-informed teachers (16). Hence, instead of exclusively offering them theoretical knowledge, having them perform extra-curricular activities will help them become more well-equipped (17).

Project-based learning requires students to design and complete projects. Students learning by this method become creative and constructive; they interact more with their classmates and can thus better develop their understanding of scientific concepts (18). Role-playing, field trips and project-based learning methods of nutrition teaching are directly related to teachers' self-efficacy.

This study provides information for teachers on how to improve their nutrition education efforts for the benefit of students. The sample size of teachers was small, however, and this study should be replicated with larger samples. All of the data used in this study were self-reported. The nature of the survey was closely connected to the act and vocation of teaching, and participants may have had a tendency to respond in a personally favourable manner or to give perceived socially desirable responses, biasing the results (19). Teachers' self-efficacy and teaching methods for preschool children's nutrition education may have profound effects on the implementation of a nutrition education

programme. It is therefore recommended that future studies investigate whether student outcomes are dependent on teacher self-efficacy and teaching method. Studies should also investigate whether these factors vary depending upon the number of hours of nutrition taught in the classroom. Nutrition professionals should push for more specific standards so that teachers have clear guidance and direction for teaching nutrition in their classrooms (20).

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