Factors influencing Nutritional Needs of Children with Disabilities in United Arab Emirates: Special Education Teachers vs Parents

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ABSTRACT

***Purpose**: The United Nations, in its Sustainable Development Goals, has strongly encouraged countries to promote good eating habits among children. However, children with disabilities are likely to have poor eating habits, resulting in their being underweight or overweight. Using a health literacy model by Nutbeam as a framework, this study has attempted to gain insights into the factors which may impact the understanding and practice of stakeholders regarding nutritional needs of children with disabilities in the United Arab Emirates (UAE).*

***Method**: The revised Food and Nutritional Literacy Scale was used to collect data from 149 parents and special education teachers. The collected survey data was analysed by computing the mean and subjecting it to t-test and one- and two-way Analysis of Variances.*

***Results:** The results showed that parents and teachers were ambivalent about knowledge and practical skills to promote good eating habits among children with disabilities. Also, variables such as age, participant type, nationality, gender, and awareness of nutritional policy were found to influence awareness about nutritional needs of children with disabilities.*

***Conclusion:** It is recommended that policymakers in the UAE expedite public education and professional development by key stakeholders in the area of safe and good nutrition for children with disabilities.*

***Key words:** nutrition, parents, special education teachers, policy, United Arab Emirates*

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INTRODUCTION

In 2017, the United Arab Emirates (UAE) government formulated the National Action Plan on Nutrition which aimed to improve the nutritional needs of all persons living in the country (United Arab Emirates Government, 2017, 2021). The policy reiterates the commitment of the government to provide strategic direction for building a healthy society. The effort of the government is in conformity with Goal 2 of the United Nations Sustainable Development Goals, which encourages countries to promote healthy living and develop systems that enhance healthy eating among all children (United Nations, 2015). While this policy is laudable, there are limited discussions on inclusion and steps to promote the nutritional needs of children with disabilities. These children are vulnerable and at risk of malnutrition in many societies including the UAE. Globally, a number of studies have reported that children with disabilities are at risk of being malnourished, overweight, or underweight (Groce et al, 2014; de Vinck-Baroody et al, 2015; Hill et al, 2015; Sedgewick et al, 2020). However, empirical research concerning the level of awareness of nutritional needs of children with disabilities (Groce et al, 2014) among stakeholders is lacking.

According to the World Health Organisation (WHO, 2011), the term "disability" refers to cognitive, physical, and sensory impairments which affect the day-to-day living experience of individuals. It is estimated that 15% of the global population is living with a form of disability (WHO, 2011), whereas in the UAE, disability affects approximately 8% to 10% of the population (Sheik, 2018). However, in all spheres of human development, these individuals are at risk of exclusion and discrimination (Heward, 2017; Opoku et al, 2020; Morgan, 2021). Although laws and policies have been enacted to improve the lives of persons with disabilities, there are lapses in service provision (Gaad, 2011, 2015, 2019). For example, children with disabilities are believed to be receiving inadequate teaching services in classrooms (Gaad, 2011; Sheik, 2018). Additionally, parents encounter challenges (related to accessing appropriate rehabilitation services, stress and limited access to work) in raising children with disabilities (Sheik, 2018; Opoku et al, 2021). While these trends have culminated in government efforts to enhance services, little to no attention has been paid to the nutritional needs of children with disabilities in countries such as the UAE.

Good eating habits are fundamental to the development of children (UNICEF, 2019, 2020). Healthy eating habits can promote growth and immunity to diseases (Ptomey & Wittenbrook, 2015; Food and Agriculture Organisation - FAO, 2018,

2022; UNICEF, 2019). Because of this, international bodies such as the FAO (2022) have begun developing nutritional guidelines which could be adopted to promote good eating habits among children. However, the growing body of literature has reported an intricate relationship between children with disabilities and poor nutrition (de Vinck-Baroody et al, 2015; Hill et al, 2015; Karpur et al 2018; Kamal Nor et al, 2019; Sedgewick et al, 2020; Narzisi et al, 2021). Specifically, children with disabilities are more likely to be overweight or underweight. This could be attributed to poor eating habits, irregular eating patterns, lack of physical activity, inadequate sleep, or genetic disorders (Hill et al, 2015). The consequences of poor eating habits can continue throughout the life of an individual (Sedgewick et al, 2019). It is therefore necessary to address poor eating habits to ensure the optimal development of individuals with disabilities.

Parents and special education teachers (a term used interchangeably as teachers in this study) spend more time with children with disabilities than any other professional or stakeholder involved in their development. While parents are the primary carers for their children with disabilities, they may lack the requisite skills to promote the development of their children (Staples & Diliberto, 2010; Opoku et al, 2021). Moreover, only a few teachers, especially special education teachers, are trained to support the education of children with disabilities (Gaad, 2011; Sheik, 2018). Given the important role of teachers and parents (Staples & Diliberto, 2010), access to nutritional services for children with disabilities is imperative to maintain their health.

Objective

This study aimed to develop insights into the factors which may impact the understanding of stakeholders, especially teachers and special education teachers, about nutritional needs of children with disabilities. Since parents and teachers are important adults in the lives of children with disabilities, it is useful to compare the awareness of teachers on the one hand and parents on the other. The current study was guided by Nutbeam's health literacy model (1998 , 2000) which explains the health information required by individuals in order to maintain healthy lifestyles in society. According to Nutbeam (2008), health literacy is a product of knowledge and practical skills. While knowledge refers to one's cognition and understanding of nutritional needs, practical skills refers to one's ability to apply the acquired knowledge (Nutbeam & Lloyed, 2021).

The study was guided by the following research questions:

1. What is the association between demographic variables (such as gender, age, nationality and participant type) and understanding of the nutritional needs of children with disabilities in the UAE?
2. Will participant type (parents and teachers) moderate the relationship between other background variables and understanding of nutritional needs of children with disabilities in the UAE?

METHOD

Study Setting

Located in West Asia, the UAE comprises a federation of seven Sheikdoms: Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah, and Umm Al-Quwain (Gallagher, 2019). The study participants were drawn from Abu Dhabi and Dubai which are the two Emirates with the largest number of persons with disabilities, schools, and rehabilitation centres.

Study Participants

The study participants were parents and special education teachers who were recruited from two of the seven Emirates in the UAE.

The recruitment of participants was guided by the following criteria:

a) Either the parent or special education teacher of one or more children with disabilities,
b) A caregiver actively involved in the development of children with disabilities, or
c) Parent or teacher above the age of 18 years who has the capacity to give consent for participation in the study.

After obtaining ethical approval, rehabilitation centres and special and inclusive schools were contacted for recruitment. The virtual link to the survey was shared with the institutions which agreed to participate in this study. The institutions shared the link with the prospective participants.

Study Tool

The revised Food and Nutritional Literacy Scale (FNLIT) was used for data collection (Doustmohammadian et al, 2017). The tool was chosen because it was

developed based on Nutbeam's theory of health literacy (Nutbeam, 1998, 2000) to measure awareness of nutritional needs among children. The instrument has two domains that align with Nutbeam's theory: cognition (understanding) and practical skills (functional, interactive and food choice). The cognition domain measures participants' knowledge of nutrition while the practical skills domain assesses preparedness to promote better eating habits among children with disabilities. While functional skills refers to the implementation of best nutritional practices, interactive skills refers to the ability of participants to educate children with disabilities about healthy foods. Food choice as skill refers to the ability of participants to make healthy food decisions for children with disabilities.

The revised scale consists of 32 items with four sub-scales: understanding (n=9), functional (n-10), interactive (n=6), and food choice (n=7). The items were scored using a five-point Likert scale ranging from '1' (strongly disagree) to '5' (strongly agree). A mean score of '4' was interpreted as more favourable on the sub-scales. The FNLIT yielded the following reliability scores: understanding = 0.88; functional = 0.89; interactive = 0.85; food choice = 0.83.

Data Collection and Analysis

The data was collected between November 2021 and March 2022. Data was then cleaned and transferred to SPSS version 28 for analysis. Data was normally distributed before being used to answer the research questions. To answer research question 1, t-tests and Analysis of Variance (ANOVA) (Pallant, 2020) were computed to understand the association between background variables, knowledge, and practical skills. To answer research question 2, two-way factorial ANOVA (Pallant, 2020) was computed to understand the moderation effect of participant type on knowledge and skills.

Ethics Approval

The study protocols were approved by the United Arab Emirates University (ERS 2021 8430).

RESULTS

A total of 149 participants took part in this study (see Table 1 for demographic composition of study participants). The mean scores showing participants' level of awareness of nutritional needs of children with disabilities were as follows:

understanding, M = 3.89; SD = 0.66; functional skills, M = 4.25; SD = 0.50; interactive skills, M = 3.53; SD = 0.68; and food choice, M = 3.87; SD = 0.57.

Influence of Demographic Variables

T-tests and ANOVAs were computed to understand the impact of demographic variables on the reported measures (see Table 1). T-tests were calculated to assess the difference between two-level demographics and measures. First, the differences between participant type and the three measures were obtained: understanding (t(147) = -4.65, p = 0.001, partial eta squared = 0.78), functional skills (t(147) = -2.40, p = 0.01, partial eta squared = 0.39), and interactive skills (t(147) = -3.23, p = 0.001, partial eta squared = 0.53). In particular, special education teachers were found to be more knowledgeable about their functional skills and more likely to interact with other stakeholders regarding nutritional needs than parents of children with disabilities.

In relation to nationality, differences were found between participants on understanding (t (144) = -1.92, p = 0.05, partial eta squared = 0.33) and interactive (t (144) = -1.96, p = 0.03, partial eta squared = 0.33). The results showed that being UAE citizens could influence teachers' and parents' understanding and interactions regarding food and nutrition of children with disabilities.

On gender, the difference was found only between participants on interactive skills (t (147) = 2.10, p = 0.02, partial eta squared = 0.36). Males who took part in this study were more likely than females to discuss nutritional needs of children with disabilities with others.

Table 1: Influence of Demographic Variables

N = 149	Sample	Understanding	Functional	Interactive	Food Choice
Participant type					
Parent	71 (48%)	3.64 (0.74)	4.14 (0.50)	3.35 (0.77)	3.92 (0.58)
Special education teacher	78 (52%)	4.11 (0.48)	4.34 (0.48)	3.70 (0.53)	3.81 (0.56)
t		-4.65#**	-2.40**	-3.18#**	1.20
Cohen's d		0.78	0.39	0.53	0.20

Nationality					
Emirati	91 (61%)	3.80 (0.69)	4.21 (0.48)	3.44 (0.70)	3.88 (0.60)
Expat	55 (39%)	4.01 (0.59)	4.28 (0.52)	3.66 (0.62)	3.84 (0.54)
t		-1.92*	-0.74	-1.96*	0.40
Cohen's d		0.33	0.13	0.33	0.07
Gender					
Male	26 (17%)	3.92 (0.42)	4.24 (0.50)	3.73 (0.48)	3.78 (0.44)
Female	123 (83%)	3.88 (0.70)	4.25 (0.50)	3.49 (0.70)	3.88 (0.60)
t		0.31	-0.06	2.10#*	-0.86
Cohen's d		0.07	0.01	0.36	0.19
Age					
21-30 years	38 (26%)	3.96 (0.64)	4.21 (0.60)	3.44 (0.65)	3.70 (0.63)
31-40 years	59 (41%)	3.81 (0.68)	4.26 (0.45)	3.54 (0.73)	3.94 (0.55)
41 years and above	49 (33%)	3.90 (0.65)	4.25 (0.47)	3.56 (0.64)	3.90 (0.55)
F		0.64	0.14	0.40	2.28
Partial eta squared		0.009	0.002	0.006	0.03
Nutritional Policy					
Familiar	99 (66%)	3.95 (0.60)	4.28 (0.49)	3.58 (0.61)	3.89 (0.57)
Never heard	45 (34%)	3.80 (0.74)	4.20 (0.51)	3.48 (0.75)	3.84 (0.60)
t		1.26	0.86	0.82	0.53
Cohen's d		0.23	0.16	0.15	0.10
Training in nutrition					
Taken PD	106 (71%)	3.86 (0.67)	4.23 (0.49)	3.48 (0.64)	3.85 (0.57)
No training	37 (29%)	3.99 (0.60)	4.30 (0.53)	3.66 (0.70)	3.89 (0.63)
t		-1.03	-0.73	-1.45	-0.35
Cohen's d		0.20	0.14	0.28	0.07

Moderation Analysis

Two-way factorial ANOVAs were computed to understand whether participant type would moderate the relationship of other demographic variables and measures (see Table 2). The results showed that participant type moderated the relationship between age and functional skills ($F(2,146) = 2.92$, $p = 0.05$) and were of moderate effect size. However, a post-hoc comparison using the Tukey HSD test showed a difference between the participants. To elaborate, in the parent group, participants between the age of 31-40 years, and at least 41 years old, better understood their functional role than those who were between the ages of 21-30 years. Similarly, teachers who were between 31-40 years of age, and at least 41 years old, had a better understanding of their functional role than those who were aged between 21-30 years.

Table 2: Effect of Participant Type and other Demographics on Measures

Source	df	MS	F	P	□2
Nationality					
Understanding	1	0.04	0.001	0.97	0.001
Functional	1	4.31	0.18	0.67	0.001
Interactive	1	11.98	0.77	0.38	0.005
Food choice	1	10.79	0.66	0.42	0.005
Gender					
Understanding	1	38.23	1.24	0.27	0.008
Functional	1	0.001	0.001	0.10	0.001
Interactive	1	42.02	2.77	0.10	0.02
Food choice	1	2.72	0.17	0.68	0.001
Age					
Understanding	2	19.34	0.63	0.53	0.009
Functional	2	68.03	2.92	0.05*	0.04
Interactive	2	15.50	1.01	0.37	0.01
Food choice	2	16.87	1.05	0.35	0.02
Nutritional Policy					
Understanding	1	5.99	0.20	0.66	0.001
Functional	1	1.30	0.05	0.82	0.001
Interactive	1	1.56	2.11	0.02*	0.001
Food choice	1	4.50	0.28	0.60	0.002
Training in Nutrition					
Understanding	1	10.37	0.34	0.56	0.002
Functional	1	17.32	0.70	0.41	0.005
Interactive	1	3.23	0.22	0.64	0.002
Food choice	1	13.14	0.80	0.37	0.006

In addition, participant type moderated the relationship between awareness of nutritional policy and interactive skills (1, 145) = 2.11, p = 0.02, small effect size, partial eta squared = 0.001.

DISCUSSION and CONCLUSION

This study was conducted using the health literacy model proposed by Nutbeam (1998, 2000) to develop insights into the nutritional needs of children with disabilities in the UAE. The study found ambivalence of participants regarding their knowledge and practical skills related to understanding the importance of nutritional needs of children with disabilities. Although participants appeared to have high levels of functional skills, they lacked the requisite skills to engage with children with disabilities about best eating practices and selecting or choosing appropriate food for them. Consequently, the participants appeared unsure about knowledge pertaining to the nutritional needs of children with disabilities. This implies that children with disabilities in the UAE may not be receiving proper nutrition. The stakeholders who spend more time with children with disabilities do not have the necessary knowledge and practical skills to promote healthy eating habits among children, affirming previous research findings that show that children with disabilities are susceptible to poor nutrition (Groce et al, 2013, 2014; Sedgewick et al, 2020).

Another trend identified in this study was the moderation of participant type on age and functional skills. In particular, older teachers and parents are more likely to know their role better in promoting the nutritional needs of children with disabilities than younger teachers or parents. This trend could be attributed to the years of experience of parents and teachers who took part in the study. In previous disability education research, it has been reported that the greater the age of teachers or parents, the more they develop requisite skills to support the development of children with disabilities (Teixeira et al, 2018; Yan & Deng, 2019; Opoku et al, 2021, 2022). Having spent more time with children with disabilities, they develop a better understanding about the pivotal role they have to play in promoting the children's nutritional needs. Conversely, younger teachers and parents have limited experience, and therefore may have limited awareness of their role in nutritional education. This finding underscores the need for health policymakers in the UAE to tailor training programmes for parents and teachers concerning their role in nutritional education and the nutritional requirements of children with disabilities.

The findings showed differences between teachers and parents who took part in this study. Teachers appeared to demonstrate more knowledge (understanding) and have better practical skills (functional and interactive ones) concerning the nutritional needs of children with disabilities than parents. This finding suggests that teachers who participated in this study better understand the nutritional needs of children with disabilities, have better insight into their role, and are more likely to interact with others about nutrition than parents. This understanding and insight is probably supported by the training received and the educational attainment of teachers. Indeed, Nutbeam (2008) has emphasised the importance of education in developing cognition and practical skills towards promoting healthy living. It is possible that teachers have either received some formal education or taken time to train themselves about nutrition and disability. Consequently, there is a need for policymakers to expedite public education about nutrition, especially among parents who are raising children with disabilities in the UAE.

There were also differences between participants based on nationality and gender on two sub-scales: interactive and understanding of nutritional needs of children with disabilities. For instance, participants who indicated that they were expats had higher scores on understanding and interactive skills than locals. Moreover, males had higher scores on interactive skills than females. This finding could be attributed to the culture and norms in the UAE. It is undeniable that UAE has a culture (Kargwell, 2012) where people show respect and maintain relationships with both intermediate and nuclear family members (Anadol & Bhery, 2020). There is a strong family bond between people (Anadol & Bhery, 2020), so they are unlikely to engage in discourse on personal issues with those who are not part of the family. This could explain the difference between locals and expats who may have a different cultural orientation. In the same way, in UAE culture females are more reserved and tend to limit their interactions to those in their inner or social circle. Therefore, it is not surprising that males who took part in this study were more likely to be interactive than females. These findings should encourage policymakers to be mindful of cultural practices and differences among people living in the UAE.

The study findings showed the moderation effect of participant type on knowledge of policy and interaction about nutritional needs of children with disabilities. Specifically, the findings revealed that parents or teachers who are exposed to the nutritional policy of UAE are more likely to interact with others about eating habits of children with disabilities. This finding is consistent with other studies

which have found a similar effect of knowledge of policy on practices (Forlin et al, 2014; Chao et al, 2016; Ekins et al, 2016; Monteiro et al, 2019). The finding also supports Nutbeam's (1998) hypothesis that health literacy is a product of knowledge and skills. It is useful to postulate that as individuals acquire more knowledge, the greater the likelihood that they would be able to apply the acquired knowledge. In this study, it is apparent that acquisition of knowledge may help teachers and parents to better interact with others about food and nutritional needs of children with disabilities in UAE. Thus, policymakers in the UAE must engage with stakeholders such as teachers and parents about the nutritional policy and the latter's role in the promotion of good eating habits among children with disabilities.

Limitations of the Study

First, the data was collected virtually through schools and rehabilitation centres. As such, study bias must be considered since the data was collected through institutions that may have recruited parents or teachers. Second, the study was conducted in two out of the seven Emirates in the UAE, which limits the generalisability of the findings. Third, like all quantitative studies, there was no opportunity to delve deeper into the experiences of the participants with follow-up interviews. It is recommended that future qualitative studies explore the experiences of parents and teachers towards promoting eating habits among children in the UAE or in other similar contexts.

Strength of the Study

The strength of the study is that this is the first of its kind in the UAE which has attempted to use the health literacy lens (Nutbeam, 1998, 2000) to understand the factors which might influence the nutritional needs of children with disabilities. The findings showed that factors such as age, nationality, gender, and awareness of nutritional policy could influence knowledge and skills of teachers and parents towards promoting healthy eating habits among children with disabilities in the UAE. However, knowledge and skills remain low among the participants; this calls for deliberate efforts by policymakers to create awareness about the nutritional needs of children with disabilities (Groce et al, 2014; Hill et al, 2015; Sedgewick et al, 2020). This could be conducted through various social media platforms and television programmes targeting stakeholders such as parents and teachers who are involved in the development of children with disabilities. In

addition, professional development programmes could be organised for parents and teachers to raise awareness about the policies, nutritional needs, and ways to promote healthy eating habits among children with disabilities in the UAE.

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