Predictors of mothers' performance in daily use of five servings of fruit and vegetables by rural preschoolers

Precede model application

Received 6 June 2019
Revised 10 October 2019
Accepted 4 December 2019

Effat Hatefnia
Social Determinants of Health Research Center, Alborz University of Medical Sciences, Kraj, Iran
Esmat Hossini
Department of Health Education and Promotion, School of Public Health, Alborz University of Medical Sciences, Kraj, Iran, and
Mitra Rahimzadeh
Social Determinants of Health Research Center, Alborz University of Medical Sciences, Kraj, Iran

Abstract

Purpose – Using the PRECEDE model, the purpose of this paper is to determine the predictors of mothers' performance in daily consumption of fruit and vegetables (FV) in rural preschoolers.
Design/methodology/approach – This study was carried out on 350 mothers of preschool children who had health records in the rural health-care centers of Iran. To collect data, a researcher-made questionnaire based on the PRECEDE model was used. The data were analyzed using the SPSS 19 software.
Findings – The results showed that 11.42 percent of the mothers observed the FV intake for their children recommended by WHO. The independent *t*-test showed a significant difference between the mean scores of predisposing, enabling and reinforcing factors.
Originality/value – This study showed that the rate of FV intake by preschool children in rural areas was much lower than the recommended WHO rate. To promote behavior, attention to the predisposing, enabling and reinforcing factors seems to be necessary.

Keywords Vegetables, Fruit, Child nutrition

Paper type Research paper

1. Introduction

Fruit and vegetables (FV) are an important part of a healthy diet and have several positive effects on health, including reducing the risk of chronic diseases (Boeing *et al.*, 2012). According to the World Health Organization, chronic diseases are the leading cause of death and disability in the world, accounting for 60 percent of deaths and 43 percent of global burden of diseases (World Health Organization, 2018). Numerous health promotion efforts reinforce increased consumption of FV because of the many resulting health benefits (Ramsay *et al.*, 2017). Eating enough fruit as a part of a healthy lifestyle can prevent chronic diseases and obesity (Boeing *et al.*, 2012). The number of overweight and obese children has increased dramatically over the past 30 years, so that over 43m

The authors declare that they have no conflicts of interest in this study. This article was derived from a research project conducted with the support of the School of Public Health of Alborz University with code 2427644 and ethics committee approval code IR.Abzum.Rec.1396.100. The authors would like to express their appreciation to the university staff who cooperated with the authors to conduct the study.

Health Education
Vol. 120 No. 1, 2020
pp. 1-10

0965-4283
DOI 10.1108/HE-06-2019-0028

children under the age of 5 are known as obese children in the world (World Health Organization, 2018).

Eating fruit in early childhood is very important, as creating health behaviors during this period will continue to adolescence and youth. Also, the risk factors for diseases are formed in childhood. Hence, healthy eating patterns in childhood will promote well-being and growth and increase the development of mental activity, and prevent complications and problems such as iron deficiency anemia, obesity, digestive disorders, and dental caries in the short-term, and chronic and endemic diseases in the long-term (Pearson *et al.*, 2010).

It seems that family-based educational interventions are potentially feasible and effective in promotion of fruit and vegetable consumption (Somerset and Markwell, 2009).

In this regard, using at least 400 gm (equivalent to five servings) of a variety of fruits and vegetables per day has been recommended by the World Health Organization to improve general health and reduce the risk of non-communicable diseases (Evans *et al.*, 2012; Oldewage-Theron and Egal, 2010). However, most people in America do not observe the recommended amount of fruits and vegetables per day (five servings), and only 6.8 percent of Americans 5.6 percent of Australians have five FV intakes per day (Cook and Friday, 2005). In Iran only 12 percent has five FV intakes per day, which is much lower than the WHO standard (Esteghamati *et al.*, 2012).

Eating behaviors of children, including fruit and vegetable consumption, are related to health issues that are multifactorial (World Health Organization, 2003; Hall *et al.*, 2009), so that the factors such as family's socio-economic status, occupational status, level of knowledge, dietary habits, seasons and access to FV are effective in children's eating behaviors (World Health Organization, 2003; Hall *et al.*, 2009). Mothers are one of the key factors affecting the growth and development of their children's health and can form the basis of their children's development from the very beginning of childhood. Researchs show that there is a direct relationship between mother's education and FV intake of children (van Ansem *et al.*, 2014; Inhulsen *et al.*, 2017; Le Heuzey and Turberg-Romain, 2015; Heydartabar *et al.*, 2016).

Early-life experiences with various tastes and flavors have a role in promoting healthy eating and favoring wider consumption of fruits and vegetables (Scaglioni *et al.*, 2018).

Given the aim of planning proper health behaviors in mothers, it seems necessary to identify and investigate the educational needs and the factors associated with mothers' behaviors. One of the most appropriate models that can be used to study the effective factors on fruit and vegetable consumption behavior is the PRECEDE model. Several studies have demonstrated the efficacy of this model in predicting the consumption of FV in different age groups (Heshmati *et al.*, 2014).

PRECEDE is a model for health education planning programs developed by Green in 1980. This model has even been revised and extended by Green himself into the PRECEDE-PROCEED model (1991) (Glanz *et al.*, 2008). In PRECEDE part of model consisting of four assessments phase: social diagnosis; epidemiological, behavioral and environmental diagnosis; educational and ecological diagnosis; administrative and policy diagnosis among which the third phase includes three main constructs (predisposing, reinforcing and enabling) and is the hallmark of this model. Various studies have shown that this model had impact on eating behavior (Dabone *et al.*, 2013; Green and Kreuter, 2005).

According to the results of different studies, the PRECEDE model provides a framework through which the predisposing factors (knowledge, attitude, perceptions, beliefs, etc.), reinforcing factors (influence of others, family, peers, health workers, etc.), and enabling factors (availability of resource, skills, etc.) are determined as the factors affecting behavior in educational diagnosis (Dabone *et al.*, 2013). Given that the aim of this study was to determine the predictors of mothers' performance in daily use of five servings of fruit and vegetable in rural preschoolers, using the PRECEDE model seemed appropriate for the investigation of the factors affecting the promotion of FV intake behavior in preschoolers.

2. Materials and methods

This is a descriptive-analytical study carried out in 2018 with the aim of determining the predictors of mothers' performance in daily use of five servings of FV in rural preschoolers through the use of the PRECEDE model.

2.1 Sample size determination

According to the data obtained from a similar study (Heshmati *et al.*, 2014) and the Coefficient of confidence of 95 percent as well as the test power of 80 percent, the sample size was determined to be 305, but considering the data drop of 15 percent, a sample of 350 individuals was studied. The research population in this study comprised the mothers of preschool children who referred to the rural health centers in the city of Aqqala.

2.2 Sampling technique

The sampling was done randomly from among the mothers of ⩽6-year-old children who referred to rural health centers in Aqqala city and had a health record in the health centers. To select the samples, we used the health records existed in the two rural health centers in Aqqala and gave each a number using the random number table. The mothers were then called and asked to refer to the center if they were willing to participate in the study. The research objective was explained to the mothers referred to the health centers and if they had the inclusion criteria for entering into the study (including mothers with preschool child (ren), consent of preschoolers' mothers to participate in the study, and not having a child with diseases that would prevent him/her from eating FV), they were justified about the questions and were asked to complete the questionnaire. The study was conducted with the ethics permission of Alborz University of Medical Sciences. All participants signed the informed consent form. Other ethical considerations were also included in the study.

2.3 Data collection tool and technique

To collect the information, a self-administered questionnaire was used based on the studies by other researchers and was evaluated by a panel of behavioral health science experts (Health Education, Psychology, Biostatistics and Nutrition) who applied some modifications to it. For content assessment, the questionnaire was provided to 30 mothers with preschool children. Subsequently, ambiguous and unclear questions from the viewpoint of the mothers similar to the subjects in this study were removed or corrected. To determine the reliability of the questionnaire, it was provided to 30 mothers, and after they completed the questionnaire, the Cronbach's α was found to be 0/7. Cronbach's α was 0.7. The questionnaire consisted of three parts. The first part included questions on demographic characteristics such as mother's age, mother's education and occupation, family income and number of children. The second part comprised the constructs of the PRECEDE model, including predisposing, enabling and reinforcing factors. Predisposing factors are those that make motivations for behavior. In this study, predisposing factors were the awareness of mothers about the benefits of fruit and vegetable consumption, the vitamins needed contained in fruit, and benefits of FV intake for the prevention of obesity and cardiovascular diseases. Enabling actors were considered a set of facilities that allowed the desired behavior. In the present study, barriers such as price of FV, their availability, having disinfectants and the ability to disinfect FV, and the time spent on cleaning FV were evaluated. Reinforcing factors were referred to the reinforcing behaviors of the people around to create and maintain behavior, and the support and encouragement of the spouse, family, friends, and health workers were evaluated. Finally, the third part of the questionnaire dealt with measuring the behavior of fruit and vegetable consumption (five servings a day). Using the questions on FV intake, food frequency questionnaire was done and used in local studies (Hosseini Esfahani *et al.*, 2010).

To evaluate the questions on awareness, a score of zero was given to the wrong answers or "I do not know," and the correct answers were scored 1. For example, "FV intake is effective in preventing cancer."

The enabling and reinforcing factors were assessed using a five-point Likert scale, including totally agree, agree, no idea, disagree and totally disagree, and the scores ranged 1 to 5. To assess the questions on behavior, a daily consumption of 5 servings of FV were scored 1, and consumption of fewer servings was given a zero score. The collected data were analyzed using the SPSS 19 software. Considering the objectives of this study, descriptive statistics (frequency and percentage) were used, and the existing relationships were also determined using analytical statistics. In the analysis of the results, the variables that were significant in a one-dimensional analysis were entered with ether method in the multivariate logistic model. The *t*-test and the logistic regression were used to compare the components of the precede model and to determine the predictors, respectively. The significance level was considered lower than 0.05.

3. Results

As shown in Table I, the highest age range in both groups is 20–29 and the mean age of the participants in both groups of the study was 29.36 years, with a variation range of 15–45 years. About 11.42 percent of the mothers reported that they observed the standard consumption of FV for their children (having five servings of FV daily for preschoolers), among which 55 percent had two children, 95 percent of them were housewives and 50 percent had elementary education.

As indicated in Table II, there was a significant difference in the mean scores of the predisposing, enabling, and enabling factors between the two groups of mothers who observed the standard rate of FV intake for their children and those who did not.

	Group 1 number (percentage)	Group 2 number (percentage)	Total
Age			
15–19	6 (15)	30 (9.68)	36
20–29	24 (60)	135 (43.55)	159
⩾30	10 (25)	145 (46.77)	155
Education			
Illiterate	10 (25)	60 (19.35)	86
Elementary	20 (50)	217 (70)	237
Diploma	10 (25)	33 (10.65)	27
Occupation			
Housewife	38 (95)	248 (80)	342
Employed	2 (5)	62 (20)	8
Income			
< $400	16 (40)	172 (55.48)	149
$400–$800	14 (35)	90 (29.03)	112
> $800	10 (25)	48 (15.49)	89
Number of children			
One	12 (30)	70 (22.58)	87
Two	22 (55)	189 (60.97)	204
Three or more than three	6 (15)	51 (16.45)	59
Fruit and vegetable consumption	40 (11.42)	310 (88.58)	350

Notes: Group 1: mothers with having five portions of fruits and vegetables daily for preschool children; Group 2: mothers without having five portions of fruits and vegetables daily for preschool children

Table I.
Demographic status of two groups of mothers with and without whole fruit and vegetables (having five portions of fruits and vegetables daily)

According to Table III, the predisposing, enabling and reinforcement factors were significant predictors of fruit and vegetable consumption behavior, so that an increase in the predisposing factors increased the chance of FV intake behavior by 3.63 percent, an increase in the access barriers led to 0.4 percent decrease in the FV intake, and finally, the chance of FV intake increased by 3.10 percent as a result of an increase in the reinforcing factors.

The Pearson correlation coefficient showed that fruit and vegetable consumption behavior had a significant direct relationship with income and education levels ($p < 0.05$), and a significant inverse relationship with the number of children and mother's age ($p < 0.05$).

4. Discussion

The results of this study showed that 11.42 percent of the mothers observed the standard rate of FV intake for their preschoolers (five servings per day) recommended by the WHO, and this is consistent with the results of the study by Kimmon, who reported that 10 percent of American adults observed that standard (Kimmons *et al.*, 2009). It was also consistent with the results of the study by Ilesanmi, in which 12 percent of the adolescents in Southwest Nigeria had consumed five servings of FV per day (Ilesanmi *et al.*, 2014), but was inconsistent with the study by Mintah, in which 29 percent of university students observed the consumption of five servings of FV daily (Mintah *et al.*, 2012). One reason for these differences might be the higher education levels of the participants in Mintah's study compared to the subjects in the present research. The results of this study showed that there was a significant difference in the mean scores of predisposing factors between the mothers who observed the standard fruit and vegetable consumption for their children and those who did not. This is in line with the results of the studies carried out by Heshmati with the aim of determining the predictors of fruit and vegetation consumption in high school girls (Heshmati *et al.*, 2014), Radmerikhi with the aim of determining the predictors of healthy eating behavior for the prevention of cardiovascular diseases (Radmerikhi *et al.*, 2017), and Kant with the aim of relationship between American children and adolescents eating behavior with their family income and education (Kant and Graubard, 2013). Although it is in contrast to the results reported by Tabasinejad, which may be due to the study type and population (Tabasinejad *et al.*, 2015).

The results of the present study indicated a significant difference in the mean scores of the enabling factors between the mothers who observed the standard FV intake for their children and those who did not. It suggested the importance of paying attention to facilities and reducing the barriers to FV consumption from the viewpoint of the mothers with preschool children, and showed the relationship between fruit consumption and

Table II. Independent *t*-test to compare the mean score of the PRECEDE model constructs in two group mothers

	Group 1 ($n = 40$); mean ± SD	Group 2 ($n = 310$); mean ± SD	p
Predisposing factors	4.50 ± .69	3.08 ± 1.10	< 0/001
Enabling factors	8.89 ± 1.88	13.56 ± 3.14	< 0/001
reinforcing factors	26.63 ± 2.17	19.64 ± 2.13	< 0/001

Table III. Logistic regression to determine factors associated with having five portions of fruits and vegetables daily

Variable	B	p	OR	95% confidence interval Lower	Upper
Predisposing factors	1.291	0.001	3.63	1.767	7.484
Enabling factors	−0.503	0.000	0.654	0.454	0.806
Reinforcing factors	1.132	0/001	3.102	2.185	4.403

enabling factors, which is consistent with the results obtained in Noroozi's study on postmenopausal women's quality of life. Noroozi stated that there was a significant relationship between the quality of life and the enabling factors (Norozi *et al.*, 2012). The finding of this study was also consistent with that of Radmerikhi, conducted to identify the predictors of healthy eating habits for prevention of cardiovascular diseases, using the PRECEDE model, which reported that there was a relationship between behavior and enabling factors (Radmerikhi *et al.*, 2017).

Another result of this study was a significant difference in the mean scores of the reinforcing factors between the mothers who observed the standard consumption of FV for their children and those who did not, which is in line with the study by Heshmati who indicated the role of key supporting factors in the tendency to consume FV (Heshmati *et al.*, 2014). Therefore, it is important to consider the reinforcing and supporting factors in health education schedules to create or to change the behavior. However, it was inconsistent with the results reported in the Tabasinejad study, which could be due to the study population (Tabasinejad *et al.*, 2015).

The regression analysis results showed that the predisposing factors were significant predictors of fruit and vegetable consumption behavior. This indicates the effect of awareness as a predisposing factor on behavior, and suggests the necessity of mothers' knowledge about different aspects of fruit consumption benefits. Thus, mothers with preschoolers should be educated on fruit and vegetable consumption. This is in line with the results of the studies conducted by Heshmati and Hunter on the quality of life of postmenopausal women (Heshmati *et al.*, 2014; Hunter and Liao, 1995). They considered knowledge as an effective factor to change participants' attitude toward F and V intake behavior and, thus, enhancing the quality life.

Parents should receive advice on how to establish long-term healthy habits and to create pleasant eating patterns in their children, while becoming aware of behavioral determinants that favor malnutrition and eating disorders (Scaglioni *et al.*, 2018). This result was inconsistent with the result of Radmerikhi study that might be because of the type of studied behaviors in the two studies (Radmerikhi *et al.*, 2017).

Other significant predictors, according to the regression analysis results, were the enabling factors. This indicates the importance of eliminating the barriers to access to FV, including high prices, lack of skill in washing fruits and vegetables, and other barriers that can affect behavior. For most participants in this study who had moderate income, high price of fruit was one of the determinants of fruit and vegetable consumption. In this regard, reducing the price of FV can increase the FV intake rate. This is consistent with the results of the study by Middaugh on the relationship between income and FV intake (Middaugh *et al.*, 2012). Another barrier for enabling factors is the lack of disinfection skills of F and V, which is in line with the results of the Nago study (Nago *et al.*, 2012). This is also consistent with the results of the study carried out by Radmerikhi, who reported that enabling factors were the main predictors of nutritional behavior for the prevention of cardiovascular diseases (Radmerikhi *et al.*, 2017). It seems that promotion of enabling factors can affect the FV intake behavior. However, this result is in contrast to the result of Arash study, which reported that there are no barriers to predicting dietary behavior (Arash *et al.*, 2016). The reason for this difference might be related to the study population.

The present study also indicated that reinforcing factors were significant predictors of FV intake behavior. In other words, the support of husbands, relatives and friends will improve the mother performance. This result is in line with that of Sörensen who reported that reinforcing factors were the strongest predictors of physical activity is Finnish middle-aged male officers (Sörensen, 2005). Although, this result contradicts the results reported in the Radmerikhi study, which may be due to differences in the studies type and population (Radmerikhi *et al.*, 2017).

Another result of the present study was the existence of a significant direct relationship between income and education level and mothers' performance. Hence, it could be concluded that an increase in the family income would increase the fruits and vegetable consumption rate. This is in line with the results of the study by Avis, in which a direct relationship was found between postmenopausal women's income and high quality of life (Avis *et al.*, 2004). Besides, increased maternal education, higher access of mothers to sources of information, and their knowledge about the benefits of F and V consumption to their children would lead to an increased rate of mothers' performance. This is consistent with the results obtained by Florindo who reported that education had a direct and significant relationship with physical activity (Florindo *et al.*, 2009). It was also found out in this study that there was a significant inverse relationship between FV intake and the number of children and the age of mother ($p < 0.05$), indicating that a decrease in the mothers' performance was associated with an increase in the number of children and the age of the mother. This is in line with the result obtained from the study by Ransdell, who reported that as age increased, physical activities decreased (Ransdell and Wells, 1998), but inconsistent with the results of Sörensen's study (Sörensen, 2005). The reason for this difference could be the type of behavior and the participants' gender.

4.1 Limitations

This study had a few limitations, including mothers' self-reporting, reliance on the mothers' memory to answer the questions, type and amount of fruits and vegetables, and finally the responses of mothers which could be influenced by their culture and social determinants.

5. Conclusion

The PRECEDE model could be used as a conceptual framework for designing and implementing educational intervention programs to promote fruit and vegetable consumption. Enabling factors, reinforcing factors and predisposing factors were found predictors of fruit and vegetable consumption, and need to be considered carefully when designing intervention programs.

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Corresponding author
Effat Hatefnia can be contacted at: e_hatefnia@yahoo.com

Health, well-being and education

Building a sustainable future. The Moscow statement on Health Promoting Schools

Kevin Dadaczynski
Department of Nursing and Health Science, Fulda University of Applied Sciences, Fulda, Germany and
Centre for Applied Health Science, Leuphana University Lueneburg, Lueneburg, Germany
Bjarne Bruun Jensen
Steno Diabetes Center Copenhagen, Gentofte, Denmark
Nina Grieg Viig
Faculty of Education, Western Norway University of Applied Sciences, Bergen, Norway
Marjorita Sormunen
Institute of Public Health and Clinical Nutrition, University of Eastern Finland, Kuopio, Finland
Jesper von Seelen
University College South Denmark, Esbjerg, Denmark
Vladislav Kuchma
National Medical Research Center of Children's Health, Moscow, Russia, and
Teresa Vilaça
Institute of Education, University of Minho, Braga, Portugal

Received 3 December 2019
Revised 6 December 2019
Accepted 13 December 2019

Abstract

Purpose – The purpose of this paper is to introduce the official statement of the Fifth European Conference on Health-Promoting Schools.

Design/methodology/approach – The Fifth European Conference on Health-Promoting Schools was held on 20–22 November 2019 in Moscow, Russian Federation, with over 450 participants from 40 countries. A writing group was established to prepare a draft version of the statement before the conference. On the basis of an online and offline feedback process, the opinions of the participants were collected during the conference and included in the finalisation of the statement.

Findings – The final conference statement comprises six thematic categories (values and principles; environment, climate and health; schools as part of the wider community; non-communicable diseases (NCDs); evidence base; and digital media), with a total of 23 recommendations and calls for action.

Originality/value – The recommendations and calls for action reflect current challenges for Health Promoting Schools in Europe. They are addressed to all actors in governmental, non-governmental and other

This publication has received funding under an operating grant from the European Union's Health Programme.

Health Education
Vol. 120 No. 1, 2020
pp. 11-19
Emerald Publishing Limited
0965-4283
DOI 10.1108/HE-12-2019-0058

organisations at international, national and regional levels involved in health promotion in schools and are to be applied for the further development of the concept.

Keywords Health Promoting Schools, Social change, Child and adolescent health, School health promotion
Paper type Viewpoint

1. The Health Promoting Schools approach and its development

The Ottawa Charter, adopted in 1986, was a milestone in the development of a holistic and positive understanding of health that requires actions at different levels, from healthy public policy to the development of personal skills, using different strategies, such as enabling and advocacy approaches (WHO, 1986). The charter can also be regarded as marking the birth of whole-school approaches to health that have been established in Europe and internationally under the term Health Promoting Schools (Stewart Burgher *et al.*, 1999).

A Health Promoting Schools reflects a holistic approach that moves beyond individual behaviour change by also aiming at organisational change through strengthening the physical and social environment, including interpersonal relationships, school management, policy structures and teaching and learning conditions. This approach can be seen as the result of overcoming traditional health education at school, which aimed to influence students' knowledge, attitudes and behaviour (Clift and Jensen, 2005). In accordance with a social-ecological perspective, health is considered to be the result of a complex interplay of individual, social, socio-economic and cultural factors (Dahlgreen and Whitehead, 1991). Since the early 1990, actions on school health promotion have been coordinated in national networks and the European network on Health Promoting Schools as a WHO supported

Box 1. Values of the Health Promoting Schools approach

Equity

Health Promoting Schools ensure equal access for all to the full range of educational and health opportunities. This in the long term makes a significant impact in reducing inequalities in health and in improving the quality and availability of lifelong learning.

Sustainability

Health Promoting Schools acknowledge that health, education and development are closely linked. Schools act as places of academic learning. They support and develop a positive view of pupils' future role in society. Health Promoting Schools develop best when efforts and achievements are implemented in a systematic and continuous way. Desirable and sustainable health and educational outcomes occur mostly in the medium or long term.

Inclusion

Health Promoting Schools celebrate diversity and ensure that schools are communities of learning, where all feel trusted and respected. Good relationships among pupils, between pupils and school staff and between school, parents and the school community are important.

Empowerment

Health Promoting Schools enable children and young people, school staff and all members of the school community to be actively involved in setting health-related goals and in taking actions at school and community level to reach the goals.

Democracy

Health Promoting Schools are based on democratic values and practise the exercising of rights and taking responsibility.

Box 2. Pillars of the Health Promoting Schools approach

Whole-school approach to health

There is coherence between the school's policies and practices in the following areas that is acknowledged and understood by the whole school community. This approach includes

(1) Taking a participatory and action-oriented approach to health education in the curriculum;
(2) Taking into account the pupil's own concept of health and well-being;
(3) Developing healthy school policies;
(4) Developing the physical and social environment of the school;
(5) Developing life competencies and health literacy;
(6) Making effective links with home and the community; and
(7) Making efficient use of health services.

Participation

A sense of ownership is fostered by pupils, staff and parents through participation and meaningful engagement, which is a prerequisite for the effectiveness of health-promoting activities in schools.

School quality

Health Promoting Schools support better teaching and learning processes. Healthy pupils learn better, and healthy staff work better and have greater job satisfaction. The school's main task is to maximise educational outcomes. Health Promoting Schools support schools in achieving their educational and social goals.

Evidence

School health promotion in Europe is informed by existing and emerging research and evidence focused on effective approaches and practice in school health promotion, both on health topics (such as mental health, eating and substance use) and on the whole-school approach.

Schools and communities

Health Promoting Schools engage with the wider community. They endorse collaboration between the school and the community and are active agents in strengthening social capital and health literacy.

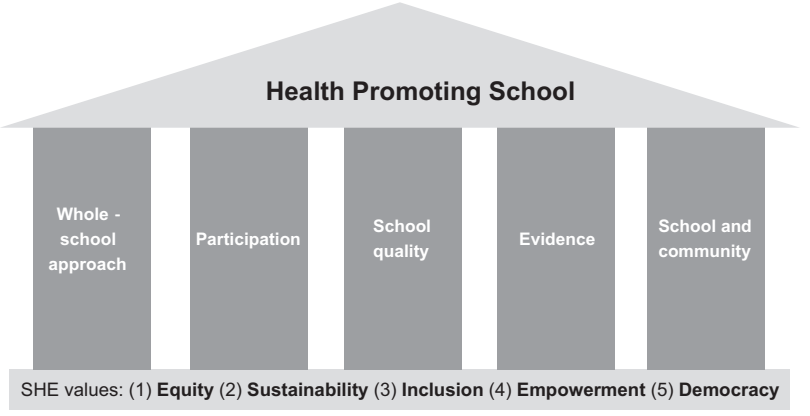

Figure 1.
The Health Promoting School approach

network. The current work on school health promotion on a European level is organised through the Schools for Health in Europe Network Foundation (SHE), with national representatives from 36 countries.

Although the concept of Health Promoting Schools in Europe has been interpreted and implemented differently in different geographical, cultural and educational contexts, its main values (Box 1) and pillars (Box 2) have remained stable and are recognised in research and policy documents and declarations (such as the Paris Declaration on Partnerships for the Health and Well-being of our Young and Future Generations; WHO, 2016, see also Figure 1 in summary and Buijs, 2009).

Since the establishment of the European network of Health Promoting Schools, four European conferences on Health Promoting Schools have been organised. The resolution of the first conference, held in Thessaloniki, Greece, in 1997, stated that every child and young person in Europe had the right to be educated in a Health Promoting Schools and urged governments in all European countries to adopt the Health Promoting Schools approach (ENHPS, 1997). The Egmont Agenda was published in 2002 as a result of the Second European Conference on Health Promoting Schools in The Netherlands and emphasised conditions, programming and evaluation as being essential to developing and sustaining Health Promoting Schools (ENHPS, 2002).

Seven years later, the Third European Conference on Health Promoting Schools was held in Vilnius, Lithuania (SHE Network, 2009). The conference and its resolution marked an important milestone in the development of the Health Promoting Schools approach by highlighting that education and health have shared interests and complement each other. Based on this, joint actions beyond sectoral responsibilities were urged.

The Fourth European Conference was held in Odense, Denmark, in 2013 and resulted in The Odense Statement, which recognised the core values and pillars of school health promotion as a strong contributor to the aims and objectives of the WHO policy framework for health and well-being in Europe, Health 2020 and the EU2020 strategy for inclusive and sustainable growth (SHE Network, 2013).

2. Recent societal challenges

Since the establishment of the Health Promoting School approach in the late 1980s, the world has seen constant societal change, with progressively faster dynamics during recent years. The changes have not only altered substantially the conditions in which people grow up and live, but have also affected behaviours in relation to health, social cohabitation, learning and working. Wars and violence, often rooted in cultural and religious differences or political and economic crisis, and climate change alter significantly the environmental and societal determinants of health (Mucci *et al.*, 2016; Watts *et al.*, 2019).

Often, it is countries that already are experiencing political and socio-economic instability that feel the effects most (Reibling *et al.*, 2017). An increase in international migration, commonly in perilous circumstances for migrants and refugees (Silove *et al.*, 2017), is the consequence, raising social tensions and challenges in many countries, some of which are undergoing political developments characterised by protectionism and isolationism that can partly be seen as a countermovement to the idea, values and principles of Europe (Harteveld *et al.*, 2018).

In many cases, uncertainty has replaced political, economic, social and individual stability, raising concern and anxiety about the future in young people and adults. This has led to an unprecedented social (grassroots) movement of participation, primarily driven by young people who are demanding social, political, ecological and economic change (O'Brien, Selboe and Hayward, 2018).

These developments should not be seen as being separate from school health promotion, the aim of which is to support young people to develop healthy and self-determined lifestyles and enable them to co-create their social, physical and ecological environments and the determinants

of health positively and sustainably (Clift and Jensen, 2005; Simovska and McNamara, 2015). As the conditions for growing up and living together change, the question arises of how schools, as places for health-related teaching, learning and development, need to adapt.

Where does the Health Promoting School approach stand today, more than 30 years after the Ottawa Charter on health promotion? Can the Health Promoting School, with its holistic orientation, deliver on its promise of addressing health inequalities and improving children's and young people's health, well-being and academic achievement? To what extent can school health promotion be implemented systematically in schools and be linked to local communities?

These and more questions were raised and discussed during the Fifth European Conference on Health Promoting School, culminating in recommendations for the future development of the Health Promoting School approach.

3. The Fifth European Conference on Health Promoting Schools

The Fifth European Conference on Health Promoting Schools was held on 20–22 November 2019 in Moscow, Russian Federation, with over 450 participants from 40 countries.

A range of topics was addressed through more than 160 contributions and nine keynote presentations focusing on conceptual aspects of the Health Promoting School approach, implementation and dissemination and current social change processes, such as digitisation and heterogeneity.

The main themes of the conference were

(1) **Holistic approaches to school-based health promotion and health education** (such as organizational change and environmental approaches to school health promotion and strategies to promote individual and organizational health literacy in schools);

(2) **Implementation and dissemination of school-based health promotion and health education** (facilitators and barriers to implementing interventions in school-based health promotion and professional development and capacity-building of, for example, teachers, non-teaching school staff, school health services, parents and external professionals);

(3) **Networking and intersectoral collaboration in school-based health promotion and health education** (schools as part of the wider community, and multisectoral partnerships at local, national and international levels);

(4) **Innovative approaches to dealing with heterogeneity, inclusion and special needs** (pupils' and teachers' health in inclusive schooling, school-based health promotion and education for refugees, students with special needs and innovative approaches to school-based health services); and

(5) **Digital media and information and communications technology (ICT) in school health promotion and health education** (practical approaches to ICT use in school-based health promotion and digital devices and media as a target for interventions and a means to promote health and well-being).

4. Recommendations for action

As a result of the research and case studies presented and discussions among conference participants, the following recommendations for action have been developed. They are addressed to all actors in governmental, nongovernmental and other organisations at international, national and regional levels, engaging with schools and/or school health promotion.

(1) We recognise and reaffirm the established **values and pillars of the Schools for Health in Europe Network Foundation (SHE).** Especially in times marked by uncertainties and ambiguities, the Health Promoting School stands by its inalienable democratic values. This foundation is the basis for all health-promoting activities in schools and reflects a human and social perspective characterised by openness and mutual respect. We, therefore, recommend that all actions on health promotion and health education involving young people must

- Be based on democratic processes and foster equal access, active involvement and participation;
- Take into account the needs and background of all young people regardless of their gender, geographical, cultural and social background or religious beliefs: in that sense, a Health Promoting School can be seen as an inclusive school that celebrates heterogeneity and diversity as an enriching dimension for mutual learning, respect and acceptance;
- Reflect a whole-school approach addressing different target groups and combining classroom activities with development of school policies, the physical, social and cultural environment of the school and the necessary capacities needed: we welcome new and established concepts and approaches within school-based health promotion, such as health literacy, salutogenesis, action competence and life skills, which should complement each other and be integrated in the holistic framework of the Health Promoting School approach; and
- Be systematically linked with educational goals and school quality as part of a so-called add-in approach: based on rich evidence, a Health Promoting School can be regarded as a school that not only promotes and maintains health, but also strives for successful learning for pupils and working conditions for teaching and non-teaching staff, and involves parents and families in the school's daily life.

(2) We recognize that **environment**, **climate and health are closely intertwined** and cannot be considered in isolation. Climate and environmental problems affect health, and health choices and actions affect climate and the environment. Environmental, climate and health issues are driven by the same fundamental structural determinants in societies. Health promotion and education for sustainable development or climate change have common goals and fields of action. We therefore

- Urge all stakeholders in health and climate/sustainability education to work together systematically to support young people to grow up and live healthily and sustainably;
- Urge all stakeholders to support and empower young people to raise their voice and make a lasting contribution to shaping a healthy and sustainable future for themselves and their fellow human beings;
- Call for actions to link planetary health and the Health Promoting School approach more explicitly by, for instance, integrating the impact of human action on the environment and its health consequences into school curricula and everyday life; and
- Call for realignment of health-promotion research agendas to address environmental challenges in, with and through schools.

(3) We advocate for a health-in-all-policies approach. Health should be promoted in all environments in which young people live and are engaged in daily activities. Although schools play a significant role in the lives of young people, school health promotion cannot be regarded in isolation from the **surrounding community**. We therefore call for

- All actors to move from a single-setting approach to an integrated multi-setting approach that systematically links actions at school level with actions in the local community: these actions should not be implemented in isolation, but in a coordinated fashion to create synergies and avoid discontinuities;
- Intersectoral collaboration among different actors and professions, such as teachers, school health services and social and youth-care services: this requires professional development, and that existing local networks and their leadership capacities be strengthened to align sectoral policies and enable the development of a common vision and language; and
- All actors to strengthen links with existing national and regional cooperation mechanisms, such as Health Promoting School networks and healthy city or healthy region networks, by pursuing joint objectives and actions.

(4) We recognize that **Noncommunicable Diseases (NCDs),** including mental illnesses, are threatening the future of many countries' health and welfare systems and their economies. As emphasised in the Jakarta Call for Action on Noncommunicable Diseases from 2011, high priority should be given in national health policies and programmes to preventing NCDs. To tackle the rising incidence of NCDs, we need to start early; the Health Promoting School can serve as an appropriate setting in which to address the objectives of the WHO global action plan for the prevention and control of NCDs, 2013–2020. We, therefore, recommend that

- A resource-oriented intervention approach (as described in the SHE values and pillars) be taken to tackle NCDs rather than a traditional top-down and disease-oriented approach, which normally dominates interventions related to risk factors;
- Young people be viewed as part of the solution and not only as part of the problem of NCDs – we need to work with young people as powerful agents of healthy change and not as victims and recipients of risk factors;
- A school environment that promotes healthy practices in areas like healthy eating, physical activity, social and emotional well-being and good hygiene be created; and
- Commercial determinants are addressed by empowering young people to become critical and responsible citizens who are able to understand and critically reflect on media advertising and market mechanisms through, for instance, consumer education.

(5) We recognize that the Health Promoting School approach will be accepted and implemented more widely if it can provide evidence of its long-term effectiveness. Despite much research on various areas of school health promotion in recent years, further efforts are needed to **make visible and further improve the research evidence base** for the holistic Health Promoting School approach. We therefore

- Call for evaluation approaches that reflect the complexity of the Health Promoting School by, for example, applying mixed-methods designs and considering graded health and educational outcomes;
- Demand that the available scientific evidence be reviewed and evaluated using existing tools and be translated into recommendations for practical action;
- Urge that a one-sided focus on outcomes research be augmented by focusing also on implementation to identify the conditions under which interventions can be effective, systematically linking both research perspectives; and
- Call for systematic and strong partnerships between researchers and practitioners who develop and implement innovative interventions in school health promotion and those who conduct empirical surveys on child and adolescent health (such as the Health Behaviour in School-aged Children (HBSC) study) and the health of teaching and non-teaching staff. By sharing available social-epidemiological data, previously untried evaluation potential can be exploited.

(6) We clearly recognise that growing up nowadays is largely driven by **high usage of digital media,** and that digital devices and applications form an essential part of everyday life. The digital transformation of health systems and increasing digitalisation of everyday life mean the availability and ubiquity of health-related information has increased rapidly and substantially over recent decades. So far, school health promotion has only partially tapped the potential and challenges of digital media. We therefore

- Call on all actors in school health promotion to use the possibilities of digital media in the context of research, development, implementation and exchange of innovative interventions and good practice;
- Urge all actors to use digital media as a supplement to, and not as a substitute for, non-digital (face-to-face) school health-promotion actions;
- Call on all actors to ensure that the use of digital media does not lead to a step back to individual and behavioural prevention, but rather is used at organisational level to, for instance, build capacity, communicate with partners outside the school and promote low-threshold participation in change processes within the school; and
- Call for actions to empower individuals and whole-school systems to deal effectively with health information complexity, including its critical assessment, selection and use and to take responsibility for providing suitable and reliable health information.

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Corresponding author
Kevin Dadaczynski can be contacted at: kevin.dadaczynski@pg.hs-fulda.de

Mental fitness in higher education: Intervention Mapping programme design

Niamh O' Brien
School of Education, University College Cork, Cork, Ireland
Martin Lawlor
State of Mind Ireland, Centre for Recovery and Social Inclusion, Carraig-Mór Centre, Cork, Ireland, and
Fiona Chambers and Wesley O'Brien
University College Cork, Cork, Ireland

Received 18 September 2019
Revised 6 December 2019
Accepted 17 January 2020

Abstract

Purpose – Higher Education Institutions observe that many students are experiencing mental health issues, such as high levels of anxiety and stress. Young adults are recognised as a vulnerable group who carry the burden of mental health problems worldwide. Mental health interventions can be effective in positively influencing students' emotional and behavioural wellbeing.

Design/methodology/approach – In the current study, the principles of Intervention Mapping (IM) were applied to guide the development, implementation, and evaluation of a specifically tailored mental health programme for a selected student cohort in a large Higher Education Institute in Ireland. Mixed qualitative (Delphi technique and focus group discussions) and quantitative (survey) data were gathered to gain a broad perspective of mental health concerns and learning needs among a sample of higher education students (n = 99).

Findings – Existing evidence guided by theoretical frameworks were blended to create a specifically tailored mental health programme to meet the needs of higher education students in Ireland. Results indicate that the established six-stages of IM provide an empirical process that has the potential to effectively respond to the mental health needs of students in higher education. IM identifies the priority needs of students in higher education and ensures that suitable behaviour change techniques for mental health are addressed. 10;

Originality/value – IM is a suitable method to critically and collaboratively develop a mental health intervention for the overall wellbeing of the general higher education student population, both nationally and globally. 10;

Keywords Mental health, Physical activity, Education, Higher education, Mental health promotion
Paper type Research paper

Introduction

The inception of the State of Mind UK programme (2011) sought to increase awareness of mental health issues, and wellbeing among professional rugby league players, and their communities in England (Lawlor *et al.*, 2015). More recently, the State of Mind Ireland (SOMI) programme was established in 2015, as an organically evolving development from State of Mind UK. SOMI has the primary aim of highlighting issues surrounding mental health in sporting communities across Ireland through enhancing mental health literacy (Lawlor *et al.*, 2015). SOMI has been identified as a skill-enhancing programme, aimed to increase levels of "mental fitness" in young adults (Breslin *et al.*, 2018; Lawlor *et al.*, 2015). The term "mental fitness" is accepted as emotional agility to stressful life events, defined as the "the modifiable

This work was supported by State of Mind Ireland (SOMI), specifically through the funding of a Ph.D. research project (2017-2020). The authors would like to thank State of Mind Ireland, University College Cork and each of the Higher Education students who participated in the research.

0965-4283
DOI 10.1108/HE-09-2019-0042

capacity to utilise resources and skills to flexibly adapt to challenges or advantages, enabling thriving" (Robinson *et al.*, 2016, p. 89). Ongoing and existent SOMI research with a selected student-athlete population deem "mental fitness" as approachable terminology, and it is specifically seen as less stigmatising for student-athletes in higher education (Breslin *et al.*, 2018). This SOMI research, specific to higher education student-athletes, determines that sport-specific mental health programmes can increase the effectiveness of mental health help-seeking behaviours, and to a lesser extent, knowledge of mental health disorders (Breslin *et al.*, 2018; Breslin *et al.*, 2017). In light of the present article, it is important to contextualise that SOMI research has since targeted the general population of higher education students in Ireland, specifically as a long-term strategy to address the mental health, and wellbeing climate of students within the higher education environment (Houghton *et al.*, 2011; Karwig *et al.*, 2015; Murphy *et al.*, 2016).

A nationwide study on young people in Ireland has previously revealed that approximately 40% of young Irish adults experience elevated levels of anxiety and depression (Dooley and Fitzgerald, 2012). Murphy *et al.* (2016) further described that the number of students in Ireland attending higher education with a formally declared mental health problem is as an "overwhelming tsunami". Higher education has significant potential to positively impact the mental health of young adults, through the provision of mental health knowledge, and the skills of wellbeing for large cohorts of young adults (Hunt and Eisenberg, 2010; Karwig *et al.*, 2015). However, academic demands have also been found to be a contributing factor to mental distress among students higher education world-wide (Thorley, 2017; Usher, 2019). Several studies show rising levels of anxiety and depression among higher education students when compared to secondary school contexts (Bewick *et al.*, 2010; Dooley and Fitzgerald, 2012). It has been proposed that Higher Education Institutions (HEI's) play an important role in responding to the mental health needs of students (Hunt and Eisenberg, 2010; Thorley, 2017).

Mental health promotion interventions for young people can have significant positive effects on students' emotional, and behavioural wellbeing, including reduced depression, anxiety and improved coping skills (Barry *et al.*, 2013; Doyle *et al.*, 2017; Winzer *et al.*, 2018). In a study investigating the recognition of depression, help-seeking intentions, beliefs about interventions and stigmatising attitudes, Reavley *et al.* (2012) highlighted that there is a need for mental health literacy interventions, specifically targeting higher education students in Australia. Low mental health knowledge and help-seeking are reported among younger age groups, with student males less likely to recognise depression and most likely to associate with stigmatising attitude to mental health problems (Reavley *et al.*, 2012). The study concludes that interventions need to address stigma and not merely educate on the symptoms of depression in order to reduce barriers to help-seeking. Other research suggests that skills orientated programmes are effective in demonstrating the benefits for wellbeing, and have successfully improved students' social and emotional skills, by enhancing their self-perceptions, and reduced subsequent levels of emotional distress, including depression, anxiety, and stress (Conley *et al.*, 2013; Karwig *et al.*, 2015). Murphy (2017) recommends that the promotion of mental health be included as part of compulsory induction programmes to higher education, while also advocating for the delivery of support services for all students be provided. In supporting research addressing the barriers to responding to students with mental health difficulties in higher education, Murphy (2017) further advocates that "whole college" approaches are required, specifically to ensure equity of participation for all students. Thorley (2017) maintains that buy-in and direction from senior leadership are a particularly integral component when considering the wellbeing and mental health needs of students in higher education.

State of Mind Ireland as a national programme recognises the well-established, and strong positive associations between mental health and physical activity (PA) (Hegberg and Tone, 2015;

Malcolm *et al.*, 2013; Mikkelsen *et al.*, 2017; Peluso and Guerra de Andrade, 2005; Portugal *et al.*, 2013). Participation in regular PA for higher education students has proven to enhance wellbeing (Malcolm *et al.*, 2013), increase resilience through protective factors (Hegberg and Tone, 2015), and alleviate symptoms of anxiety, depression and stress states (Mikkelsen *et al.*, 2017) through a number of factors, which include biological, social and physiological health improvements. The most recent Student Activity and Sports Study Ireland (SASSI) report found that 71% of males, and 58% of females, attending higher education were categorised as highly active, when compared to the 36% (29% male: 42% female) who were identified as insufficiently active in terms of meeting the recommended PA guidelines for health (Murphy *et al.*, 2016). Studies continue to show that sustained PA engagement among young adults in higher education can improve subjective wellbeing in young adulthood, despite the transitional nature of this stage of life (Cekin, 2015; Murphy *et al.*, 2018).

The purpose of this study is to provide an innovative, research-based approach in the re-design and development of an existing mental health and PA education intervention for higher education students in Ireland. This article documents the evidence-based process, and protocol associated with the Intervention Mapping (IM) technique, as used through a case-study approach in a large, higher education university context in the Republic of Ireland (Bartholomew Eldridge *et al.*, 2016). The article will guide the reader through the key features of quality associated with the revised SOMI programme for higher education students. Using IM, the programme has been designed for the general higher education population, and has been specifically developed to influence the complex determinants of mental health issues experienced by the priority population. IM may be well suited for designing higher education interventions, as the process is a multi-faceted practical approach tailored to the needs of a specific population, and has been used in similar contexts previously (Ammendolia *et al.*, 2016; Boucher *et al.*, 2015). SOMI will be referred to as SOMI-Higher Education (SOMI-HE) for the remainder of this study to distinguish the previous research undertaken in SOMI (Breslin *et al.*, 2018).

Methodology

Participants and recruitment – prior to the IM process

The ethical approval for the SOMI-HE study was obtained from the Social Research Ethics Committee (SREC) at University College Cork, in April 2017. Ninety-nine participants assisted and contributed to the IM exercise, specifically as part of the re-design process to the SOMI programme. All participants were provided with an ethics information sheet, and consent form by the Principal Investigators (PI's), prior to their participation in the research. An expert planning team was also established prior to the data collection phases, comprising of a psychiatrist, two psychologists, a mindfulness teacher, a higher education student, five clinical mental health nurses, a higher education lecturer (with PA-specific expertise), a community health project manager and two researchers.

Intervention Mapping (IM)

IM is a health promotion planning framework, comprising of several tasks (Bartholomew and Mullen, 2011). This framework ensures effective decision making, appropriate theoretical selection, and the practical application of methodological considerations during each stage of an intervention design (Bartholomew Eldridge *et al.*, 2016). There are six chronological steps associated with the IM process. Figure 1 details the specific requirements within each of the IM phases and these phases create a layered blueprint of theoretically supported components, which address the associated causes and determinants of health, and the corresponding practical mechanisms to health behaviour change (Bartholomew and Mullen, 2011). IM has

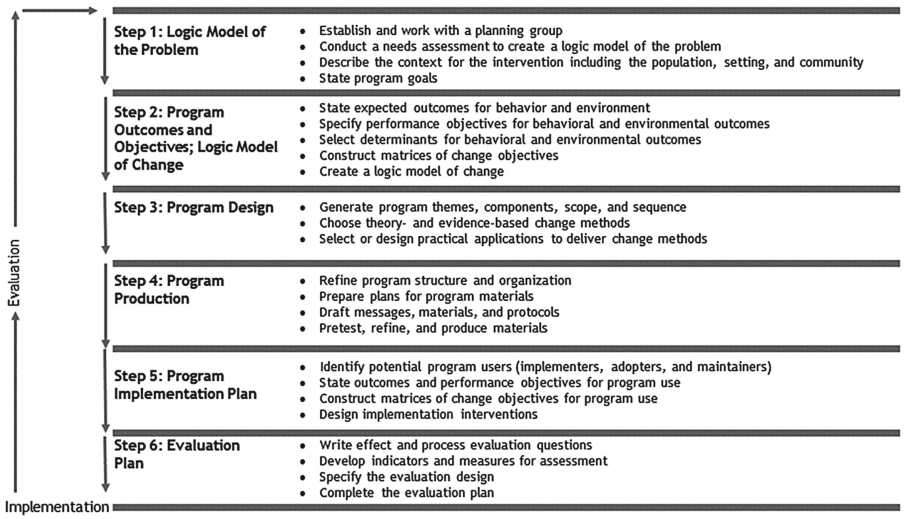

Figure 1.
The associated IM Steps (taken from Bartholemew, 2016, p. 13)

been tendered as a suitable systematic tool for developing innovative health promotion programmes for complex health problems through a comprehensive theoretical approach (Ammendolia *et al.*, 2016; Koekkoek *et al.*, 2010; Mceachan *et al.*, 2008; Van Stralen *et al.*, 2008). As part of this study's methodology, the six steps of IM will be outlined in the context of the revised SOMI-HE intervention.

IM step 1: needs assessment, and the logic model of the problem

The first step of IM, as part the revised SOMI-HE programme was to establish a planning group to work with throughout the project, and to conduct a needs assessment of the targeted cohort, as a means of creating a logic model to the identified problem. The intervention aims to address the low levels of wellbeing and high levels of mental health issues among higher education students through an educationally robust programme.

"Changing something requires understanding it first" (Kok *et al.*, 2016) Conducting a needs assessment to create a logic model of the problem for the SOMI-HE programme design included an assessment of multiple components, comprising of scientific, epidemiological, and behavioural perspectives of the at-risk group through (1) a comprehensive literature search of the mental health problem among higher education students, (2) gathering expert opinion through a Delphi-exercise on the programme content, methods to address the mental health problem and the personal determinants of risky and health-promoting behaviour (3) identifying the behavioural determinants associated with low levels of higher education students mental health through focus group discussion (4) evaluating the student feedback on the strengths and needs of a previously used SOMI programme.

(1) Literature review. The first element of the needs assessment involved a comprehensive literature review undertaken by the PI's and research team, who assessed the population, their risk, and the specific low levels of mental health among higher education students. The literature review served to understand the current national mental health and PA trends, their associated health determinants, and the barriers connected with mental health issues surrounding stigma and lack of PA among young adults. Literature was gathered from existing databases with research-informed Irish data featuring as an important part of step

one. Prevalent themes were selected and included; mental health literacy, wellbeing, resilience, help-seeking, and the PA participation of young adults.

(2) Delphi-exercise. Traditional to the Delphi method, the literature review informed the development of the Delphi-exercise (Dalkey and Helmer, 1962). The Delphi technique is a group process used to survey, and elicit the opinions of experts on a particular subject (Yousuf, 2007). In this research, the Delphi-exercise was used to formulate an empirical consensus of the SOMI-HE programme content through collating data from a panel of discipline-specific experts (n = 14) (Linstone and Turoff, 2002). The Delphi method is recognised as a suitable research and educational planning tool (OBrien, 1978). Delphi method is usually an anonymous process, however, in this study anonymity was not necessary as all stakeholders preferred to contribute to a common goal of improving higher education student mental health through open discussion. Anonymity can reduce the credibility of the study, making experts inaccessible for future consultation and research development (Green, 2014). Typically used as a quantitative technique (Rowe and Wright, 1999), this research used the Delphi methods as part of a qualitative approach to holistically engage participants (Fletcher and Marchildon, 2014). The non-anonymised Delphi process was modified through facilitating two rounds of structured panel discussions based on repeated open-ended questions within the domains of mental health and PA participation of young adults. Data collected in the literature review were presented to the panel. Stakeholder opinions were specifically collected based on five themes; including (1) mental health literacy, (2) wellbeing, (3) resilience, (4) help-seeking, and (5) the PA participation of young adults. Using an innovative method, the facilitator gathered consensus on these themes through asking the expert panel to respond to the repeated open-ended questions mapped on a KWL chart in both rounds of the Delphi exercise. KWL (Ogle, 1986) explores comprehension and activates background knowledge of a topic through investigating: What we know, want to know, and what we have learned. In other studies, a similar qualitative approach to the Delphi Method has proven to be a reliable means of hearing practitioners and the students lived experience, bringing evidence-based practice to the real world (Sharkey and Sharples, 2001). A modified Delphi exercise, adapted from Hiriscau (2016), followed six phases over a nine-month period (see Figure 2).

(3) Student focus group. The third element of the needs assessment data collection for SOMI-HE consisted of focus group (FG) interviews, with a representative sample of higher education, mixed-gender students (n = 6). Two semi-structured FG interviews were conducted on campus with students who had completed the previously established and existing SOMI programme in March 2017. The focus group aimed to (1) understand what students liked and disliked about the original SOMI and (2) what were the determinants and barriers to positive mental health behaviours, such as help-seeking and PA participation in higher education. Lasting approximately one hour in duration, the FG's were held shortly after the students received the existing SOMI programme. The first five questions were selected specifically to learn about what students wanted from a mental health education and PA promotion programme in higher education (Krueger and Casey, 2015). The remaining five questions designed by the research team aimed to further understand issues and determinants surrounding students' mental health behaviours. These questions were created based on the emergent themes from the comprehensive literature review, including mental health literacy, wellbeing, resilience, help-seeking, and the PA participation of young adults.

(4) Student evaluation questionnaire of existing SOMI programme. The final element of the SOMI-HE needs assessment included an evaluation questionnaire designed to capture higher education student feedback immediately after participants had completed the existing SOMI programme. Summary findings were sought through closed, and open-ended questions from a convenience sample (n = 99). The evaluation instrument measured participants satisfaction with the existing SOMI programme duration, location, facilities, timing, presentation style,

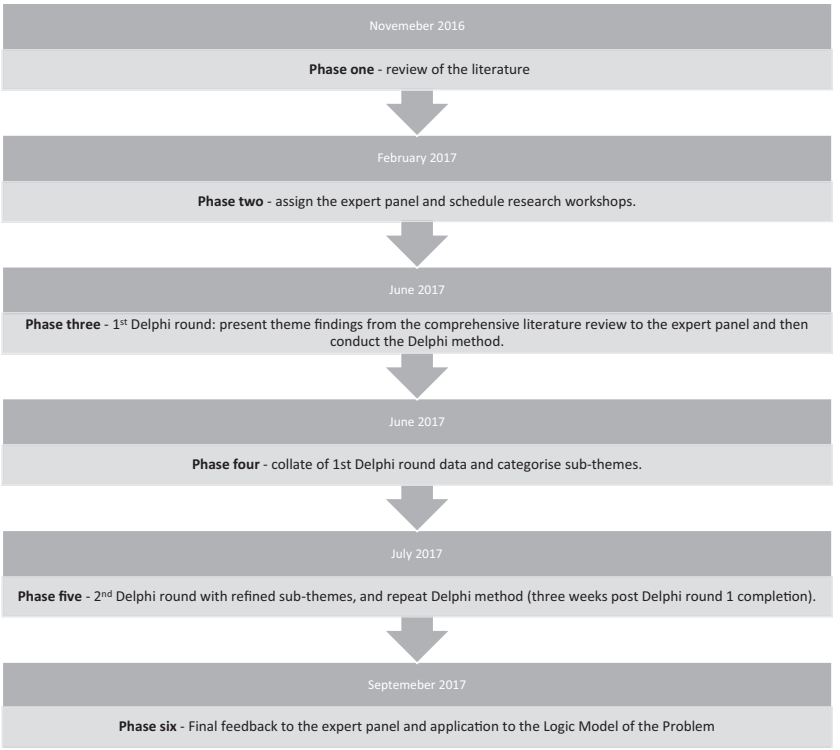

Figure 2.
Delphi exercise, adapted from Hiriscau (2016)

training aids, discussion opportunities, and training objectives through the use of a five-point rating scale (excellent, very good, good, fair, needs improvement). Three open-ended questions investigated participants' opinions on what aspects of the programme were useful, unhelpful, and needed change.

IM step two: identification of programme outcomes, performance objectives and developing a matrix of change objectives

The Logic Model of change designed in step two of the IM process for SOMI-HE provides the intervention with a solid foundation, specifying who and what will change as a result of the intervention (Bartholomew Eldridge *et al.*, 2016). In step two, the determinants of both risky and health-promoting behaviours are analysed. These behaviour determinants are understood as generic, modifiable, aggregates of beliefs' specific to the target population (Kok *et al.*, 2016). Behaviour determinants usually include cognitive process such as knowledge, beliefs, attitudes, values, self-efficacy, outcomes expectations and skills (Bartholomew Eldridge *et al.*, 2016). These determinants are matched to appropriate theories that may effectively change the behaviours identified (Kok *et al.*, 2014). The product of IM step two is a set of matrices outlining the behavioural change determinants required to achieve the desired mental health and wellbeing outcomes. These outcomes are more specific than traditional programme goals and objectives, these matrices are exact intervention foci statements of what participants should accomplish in the completion of the revised SOMI-HE programme (Bartholomew Eldridge *et al.*, 2016; Bartholomew and Mullen, 2011).

IM step three: designing the programme using theory and practical strategies

In step three of IM for SOMI-HE, the logic model of change, as created in step two informed the generation of programme ideas, themes, components, scope, and sequences for the revised SOMI programme. Behaviour change theories suitable to the target population, programme duration, and style of delivery were identified as evidence-based approaches and transformed into Behaviour Change Techniques (BCT's) to address the programme objectives (Abraham and Michie, 2008b; Bartholomew Eldridge *et al.*, 2016; Bartholomew and Mullen, 2011; Hagger *et al.*, 2014; Kok *et al.*, 2016). Conditions for the effective selection of BCTs must: (1) target a determinant that predicts behaviour; (2) be able to change that determinant; (3) be translated into a practical application tailored to the learning needs and context of the higher education student population (Kok *et al.*, 2016).

IM step four: production of the revised SOMI-HE programme

Step four of the IM process was a creative phase, in which the research team used the core BCT's, as outlined in step three to produce messages, resources, and activities. Step four's pilot testing of the SOMI-HE programme was implemented by exposing key components to a small sample of higher education students ($n = 50$), and to a selected sample from the Delphi expert panel ($n = 4$). An anonymous evaluation feedback sheet asked the participants from the pilot programme production exercise for their thoughts and recommendations.

IM step five: programme implementation plan

The fifth step of the IM process for SOMI-HE requires the implementation of another matrix development, similar to step two (Bartholomew Eldridge *et al.*, 2016). As part of this stage, the research team is advised to conduct a needs assessment for the implementation of performance objectives, with personal and external determinants. The research team accessed the students through local-level approaches, making formal links with selected academic departments and individual lecturers in the selected higher education setting. Through this collaborative and local-level approach, adoption of the programme depended on the uptake of an interested programme co-ordinator and/or lecturer within the university. The PI's refer to this as "championing" in the research.

IM step six: evaluation plan

The final step six of the IM process for SOMI-HE comprises of the evaluation plan for the revised SOMI programme. A quasi-experimental pre and post-test study was conducted with two groups of postgraduate degree student teachers, repeated over two years, specifically to determine whether the programme reached its goals in changing the behaviours associated with the determinants, using a mixed-methods research design.

Data analysis

The multi-stage, mixed methods data collection described in step one and the design of SOMI-HE (steps two to six) were completed over a fifteen-month period (November 2016 to February 2018). The first stage of data collection in the IM process as parts of the needs assessment, the literature review, was completed using empirically robust and peer-reviewed sources only. Key themes from the literature review were identified through summarising studies relative to the mental health and PA levels among higher education students. Furthermore, the data from the first and second round of the Delphi process were analysed using a thematic approach (Braun and Clarke, 2006; Maguire and Delahunt, 2017). Thematic content analysis is effective for Delphi research studies in mental health education (Sharkey and Sharples, 2001). To ensure the trustworthiness of the qualitative data in both rounds,

themes identified were reviewed by the two other senior researchers. Additionally, further validity in terms of the thematic content analysis was sought from members of the expert panel. The semi-structured FG interviews were recorded via Digital Dictaphone (Olympus Digital Voice Recorder WS-852), transcribed verbatim, and anonymised. An inductive thematic analysis was used to identify themes, organise, describe and interpret data in rich detail (Braun and Clarke, 2006). The analysis followed a six-step procedure as outlined by Maguire and Delahunt (2017). Finally, the SOMI evaluation survey was analysed descriptively using Statistical Package for the Social Sciences (SPSS). The open-ended questions from the evaluation form were analysed using similar thematic approaches, as applied in the Delphi Method and the semi-structured FG interviews. The data retrieved from step one of the IM exercise specifically informs the results for the design and implementation of the SOMI-HE programme to follow.

Results

Outcomes from the IM process for SOMI-HE are described in this section, according to the previously identified six steps of the (Bartholomew Eldridge *et al.*, 2016) protocol. Step one of the results from the IM process provides data from the needs assessments and the design of the logic model of the problem (see Figure 1). Each of the remaining IM steps (two to six), are then informed by the results from step one of the IM process for SOMI-HE.

IM step one: needs assessment, and the logic model of the problem results

(1) Logic model of the problem: literature review results for SOMI-HE. The literature review investigated the mental health and PA levels of students attending higher education. Five key themes were identified; (1) mental health literacy, (2) wellbeing, (3) resilience, (4) help-seeking, and (5) PA participation of young adults in higher education. Substance use, social support, knowledge, skills, stigma, attitudes, barriers and mental health literacy were prominent cognitive, social and behavioural determinants of positive mental health among young adults attending higher education (Davoren *et al.*, 2013; DeBate *et al.*, 2018; Reavley *et al.*, 2012; Kickbusch, 2008; Bröder *et al.*, 2017; Gulliver *et al.*, 2012). Social support, gender, sedentary behaviour, planning with others, knowledge, skills, self-efficacy, motivation, perceived barriers and substance-use were common determinants of PA engagement in the general and young adult population (Condello *et al.*, 2017; Deliens *et al.*, 2015; Rovniak *et al.*, 2002; Vainshelboim *et al.*, 2019).

(2) Logic model of the problem: Delphi Method results for SOMI-HE. The expert panel responses to the KWL activity highlighted issues of priority under the concept of mental health literacy. The expert panel emphasised how the college social system can impact low help-seeking behaviour, and low use of resilience-building strategies, asserting that mental health literacy and sign-posting are major areas of importance for early intervention. The expert panel determined that there is a need to normalise and give students the language to recognise mental health in order to raise awareness, reiterating the concept that *we all have mental health*. Under the theme of wellbeing, the expert panel discussed students experiencing high levels of stress and anxiety. They recognised PA as a method to enhance wellbeing through increased connections with others, and as a strategy to reduce stress/anxiety. Teaching students' mindfulness was another consensus strategy, which was consistently identified as a method to engage higher education students to pay attention to their own mental health and as a strategy to increase their sense of wellbeing. Under the resilience theme, the panel emphasised that during the higher education cycle, students have the absence of *one good adult*. In each round of data collection, the association between "one good adult" and higher levels of resilience were consistently outlined. The theme of resilience

overlapped with the fourth theme, help-seeking. The panel continually referred to other Irish research (Dooley and Fitzgerald, 2012) indicating the association between having one good adult and positive, protective indicators of mental health. Finally, PA for positive mental health was identified as a key area for content development in SOMI-HE. The expert panel also agreed that motivation to begin and sustain PA behaviours were problematic for many higher education students, many of which commented that in stressful times, PA was most likely to *drop off*. The emerging behaviour determinants extrapolated from these themes included the environment, knowledge, skills, self-efficacy, motivation, outcome expectations, risk perception, and perceived barriers; these themes were mapped accordingly onto the logic model of the problem (see Figure 3) and incorporated into the subsequent IM steps for SOMI-HE.

(3) Logic model of the problem: focus group results for SOMI-HE. Focus groups interviews were held to evaluate student reflections and feedback on the original SOMI. Doing so was complimentary to the above Delphi findings, offering students an opportunity to elaborate on their experience of participating in a mental health intervention programme. These findings indicate that students determine there is a need for such programmes, however, if programmes are not tailored to the needs of students, they are less likely to find the programme engaging and therefore less effective.

Provision is compassion. This first theme determined by the FG research was the students expressed the need for mental health interventions for themselves and other young adults attending higher education. Students discussed the challenges of stigma and the necessity to offer more support to students through increasing mental health literacy. One female postgraduate student highlighted what it meant to be allocated the time-out from regular lectures to learn about wellbeing. Expressing that she appreciated the priority and attention shown to the student cohort by providing them with the opportunity to complete the programme she asserted: I think a lot of us know a lot about wellbeing, but I think it is nice

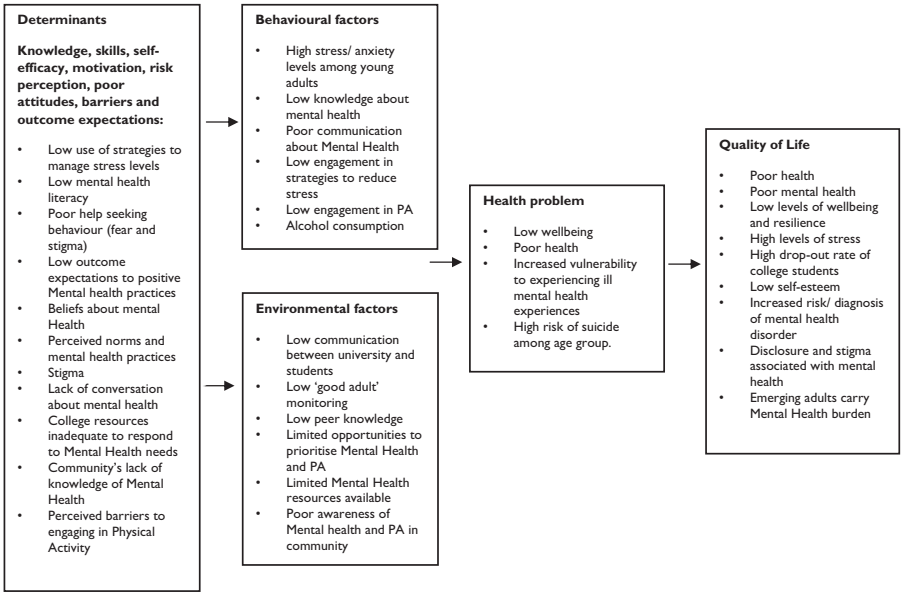

Figure 3.
SOMI-HE Logic model of the problem mapped from the data collected in step one of IM (Bartholomew Eldridge *et al.*, 2016)

actually to get the terms and get the actual information. Another female participant stated: "Yes. There could be people in our class that are struggling and do no't recognise they are struggling, but if they went to the course, they could see that they are. . ."

Reducing barriers–stigma is work in progress: When asked whether programmes can reduce mental health stigma, participants maintained they felt programmes like SOMI would be effective in reducing stigma but also felt that higher education mental health services still needed to develop this area for students. A male postgraduate participant gave his general overview of mental health stigma, expressing:

> I think they (HEI's) have got an awful lot better. . . but I think there is still a long way to go. I think mental health issues still exist. We are open to talk about it now but we weren't before.

His female postgraduate peer reiterated his point and shared a common perspective: "Something is still wrong. The stigma is still there but I think the programmes. . . are helping. It is getting there". For this reason students suggested that programmes should be mandatory for all to attend so that the reach and effect of the programme are maximised. Two female participants conversed and exchanged the view that if the programme is left voluntary for students to attend, it would not be as effective. One female postgraduate student stated if the programme was optional: "the same kind of people are going to come, the problem is the people that you are not going to be able to reach". While her undergraduate peer agreed: "I think it should be mandatory in your course, and it should be mandatory to go".

Students revealed they enjoyed learning new concepts and language, emphasising that terminology used in SOMI, such as "mental fitness" was seen as a merit of the programme as it was less stigmatising. One female undergraduate student announced: "when you say something like 'fitness' everybody knows what physical fitness is and when you say mental fitness it may prompt you more to look after yourself". Her peer concurred and responded: "It sounds nicer. When people hear the words 'mental health' they think about the negative disorders that people have. Whereas the word fitness is more positive, so people may have less stigma towards it". Participants predominantly reported that they felt "talking" was the most important factor in maintaining wellbeing. Poor communication, knowledge, skills, and access to services were seen as barriers to maintaining positive mental health.

We need to connect: This theme explored the students want for connection and active engagement with the programme material. Participants felt they had little time for discussion in the previously delivered SOMI programme stating: "we could have had more of an open discussion, more time for feedback and opinions". The students discussed at large that the programme did not help them to connect with one another and engage in a meaningful mental health discussion. A female postgraduate participant suggested: "Maybe reduce the PowerPoint's because there was a lot of slides". This theme also highlighted the necessity for relatable material and resources to be considered as relevant to the revised SOMI-HE. The previously existing SOMI programme was originally designed for sporting communities, therefore, there were many components of the programme that the selected sample of higher education students could not identify with. One undergraduate female participant reported: "I just didn't connect with it. . ."

Mindfulness: The fourth theme indicated participant enjoyment of learning about and using mindfulness. A female undergraduate student expressed how she enjoyed the effect of mindfulness:

> I think talking about the ways that you could improve your mindfulness (was interesting). I really `liked the way that you actually went through it (mindfulness) and did the exercise because I felt relaxed doing it. I was almost falling asleep; I was really relaxed.

This feedback emphasised the extent to which practical strategies and skills can enable students to experience the perceived outcomes from participating in positive health behaviours.

Exercise is good for your health. The final theme captured student recognition of the benefits of PA for wellbeing. Students described already knowing PA is good for their health, however, there are barriers to success in achieving the benefits of PA. For example, students felt they cannot prioritise PA. A postgraduate student expressed how she felt PA was another stressor that would inhibit her academic progress:

> We all know we should (exercise), but it is doing it (is the problem), We all have lessons to plan and reflections to write and they all have to be done before tomorrow, and if you go for a walk first and you do feel better when you come back but you also know that you are going to be up past 12, 1 o'clock.

In this case, there was tension between the perceived benefits and the perceived drawbacks of taking the time to be physically active. Students perceived both time limitations and a heavy workload as inhibiting factors to increasing PA, directly expressing that: "it's just finding the time to do it. . . it sounds like an excuse but it is just so hard". Social influence and appearance were seen as motivators that increase student PA, whereas limited time, fear of judgement, knowledge, access to facilities, lack of routine and motivation were seen as barriers. Behavioural determinants of positive wellbeing strategies themed from the FG discussion include the environment, knowledge, skills, motivation, self-efficacy, poor attitudes and perceived barriers.

(4) Logic model of the problem for SOMI-HE: evaluation form results. The descriptive evaluation questionnaire data from SOMI revealed that participants' had their highest satisfaction with the "SOMI presenter" ($M = 4.6$ out of a max value of 5.0, SD = 0.730) and had their lowest satisfaction with the "discussion opportunities" ($M = 3.0$ out of a max value of 5.0, SD = 1.07). The qualitative data from the open-ended questions in the SOMI evaluation questionnaire presented similar findings to the previously mentioned semi-structured SOMI FG. Data analysis suggests that higher education students were most satisfied with how the programme raised awareness of stress and the overall benefits of PA participation. Existing SOMI components, such as the "Five-ways to Wellbeing" (Aked *et al.*, 2008), mindfulness, "one good adult" (Dooley and Fitzgerald, 2012) and neuroplasticity emerged as the most helpful components of the existing SOMI programme. Participants reported an appreciation towards the friendliness of the presenter and their normalisation of attitude towards mental health. The least helpful elements of the programme included a lack of engagement and discussion, limited time and an absence of clear take-away resources. Participants reported dissatisfaction towards accessing the programme around their formal academic time-table, and the provision of unrelated sporting orientated material.

The combination of results from all four methods of the needs assessment data collection were combined and mapped to create the Logic Model of the Problem in step two of the IM process for SOMI-HE (see Figure 3). Determinants were triangulated, prioritised and matched to their changeable behaviours within the reach of the intervention programme. The final selected determinants comprised of knowledge, skills, self-efficacy, motivation, risk perception, poor attitudes, barriers and outcome expectations.

IM step two: identification of programme outcomes, performance objectives, and change objectives results

Based on the needs assessment, as carried out through the robust protocol in step one of the IM process for SOMI-HE, the overall behaviour outcomes for the students in higher education were defined as follows:

(1) Develop knowledge and application of positive mental health strategies to increase mental fitness through evidence-based practices.

(2) To reduce mental health stigma among higher education students and promote help-seeking behaviour.

(3) To increase levels of PA according to the international guidelines.

Matrices of change were designed to address the selected changeable determinants identified in the Logic Model of the Problem. Through writing specific change objectives as exemplified in Table 1, the programme designer can clarify explicitly what needs to change in both the behaviour and the environment to improve health and quality of life.

IM step three: designing the programme using theory and practical strategies results

The revised SOMI HE programme was designed to be delivered to a maximum of 150 students per sitting, with a dosage of to 2 × 90-min sessions across two weeks – this revision increased the dosage and duration of the existing SOMI programme from a standalone 75-min intervention. This revised programme duration and dosage alteration was in response to the findings of the student FG's in parallel to the advice from the expert panel as part of the Delphi-exercise. The revised SOMI-HE programme was created as an interactive learning experience in direct response to the proposals made throughout the research process in step one of the IM, i.e. the needs assessment. An additional interactive higher education student workbook was also designed to complement the revised audio-visual programme, specifically as a strategy to increase active student engagement. Some relevant components from the existing SOMI programme were maintained in the re-design phase of SOMI-HE. For example, "The Five Ways to Wellbeing" (Aked *et al.*, 2008) and "One good adult" (Dooley and Fitzgerald, 2012) were the preferred components of the existing SOMI programme, which were favoured by the students, as indicated by the results of step one's needs assessment (Aked *et al.*, 2008) Guided by the research informed data from Bartholomew and colleagues (Abraham and Michie, 2008a; Bartholomew Eldridge *et al.*, 2016; Kok *et al.*, 2016), the most suitable theoretical models were chosen to identify appropriate theoretical determinants. From the theories selected, a list of BCT's, as applicable to the SOMI-HE content were selected from the taxonomies produced by Abraham and Michie (2008b), Bartholomew Eldridge *et al.* (2016), Bartholomew and Mullen (2011), Hagger *et al.* (2014), Kok *et al.* (2016). The BCT's were

Performance/ behaviour objectives	Determinant 1 knowledge/ awareness	Determinant 2 attitudes and barriers	Determinant 3 skills	Determinant 4 self-efficacy	Determinant 5 outcome expectations/ motivation
Have increased knowledge of positive mental health, stress and resilience	Express on the concept of positive mental health and wellbeing	Understand that stress is a normal part of life	Recognise that students already maintain some positive mental health strategies and highlight the need to use other varied methods	Belief in the ability to monitor and manage stress with mindfulness	Explain that discussing mental health is important to normalise and destigmatise mental health conversations

Table 1.
Example Matrix of Change created in SOMI-HE

Note(s): Outcome 1: To gain knowledge and practical application of positive mental health strategies and increase student awareness of their mental health needs

then developed into icons as coding indicators, later used as a further strategy for the development of a facilitator's manual in the revised SOMI-HE programme. A sample taxonomy of the BCT's in SOMI-HE are exemplified in Table 2 (see below).

Theoretically sound intervention strategies to impact behaviour change were included in this stage of the programme design for SOMI-HE. Bartholomew Eldridge *et al.* (2016) assert this enables planners to develop a solid foundation in theory and evidence through ensuring that planners select methods that are congruent with scientific evidence. Each of the behaviour outcomes and the associated theoretical methods were matched with their determinant, along with an application strategy that was deemed appropriate to positively impact the determinant (See Table 3). These strategies often incorporate student-related workbook (WB) activities, completed by the participants as the SOMI-HE programme unfolds.

IM step four: programme production for the revised SOMI programme results

The interactive SOMI-HE presentation, alongside the two developed student workbooks, were piloted with a sample of $n = 30$ undergraduate university students in January 2018. Students were exposed to short segments of the SOMI-HE programme for 20 min over a six-week block, typically before the end of a weekly lecture. Student participants who completed the pilot of SOMI-HE reported enjoyment in these revised presentation and wellbeing components, however, feedback suggested that there was a mismatch between the volume of group activities between sessions one and two. The revised theoretical structure of the SOMI-HE programme appealed to the expert panel of members, and the revised interactive application strategies were seen as coherent and engaging.

Icon	Taxonomy of behaviour change techniques (methods)	Theories
 Elaboration	Elaboration–Stimulating the learner to add meaning to the information processed. Methods used to elaborate are effectively encouraged through discussion. Discussion allows for thought processing of information and may help contribute to long term recall	Social Cognitive Theory (Bandura, 1977) Operant conditioning (Skinner, 1938)
 Guided practice	Guided Practice- Prompt individuals to rehearse and repeat the behaviour various times, discuss the experience, and provide feedback	Social Cognitive Theory (Bandura, 1977)

Table 2. Taxonomy of behaviour change techniques–samples from SOMI-HE

Behavioral outcome	Determinants and change objectives	Method	Application	Slide	Workbook
Have increased knowledge of positive mental health, stress, resilience and positive mental health strategies	Knowledge on the concept of positive mental health and its impact on wellbeing	Elaboration	The word tree (group brainstorm – what is mental health). Highlight perspective of mental health can be negative	Slide 4 Slide 5	WB p. 3

Table 3. Methods and application strategies to address behavioural outcomes and their determinants in SOMI-HE

IM step five: programme implementation plan results

As this IM process for SOMI-HE was part of a single site, convenience sample, case-study approach in a higher education setting, the programme implementation plan consisted of contacting four respective academic departments within the university. E-mail correspondence comprised of contacting each department administrator and providing information about the SOMI-HE programme and research. If the department expressed interest in championing the SOMI-HE programme, and allocating provision for programme delivery to students in higher education within the formal lecture timetable, the research team proceeded to meet face-to-face with the head of department, and the teaching faculty. The research team and the department worked together to schedule advertisement visits and programme delivery days during allocated lecture time slots. Two of the four contacted academic departments successfully agreed to allocate the intended 2 x 90 min sessions of the SOMI-HE intervention to their higher education enrolled students. The research team continues to develop and amend step five's programme implementation plan, as the impact of the programme depends not only on its effectiveness of design but also the effectiveness of its dissemination (Bartholomew Eldridge *et al.*, 2016).

IM step six: evaluation plan

In the sixth step of the IM process for SOMI-HE, the evaluation and data collection plan were developed to determine the programme efficacy for the revised SOMI-HE, in an attempt to add to the body of research that defines evidence-based interventions (Bartholomew Eldridge *et al.*, 2016). The evaluation process is currently under review as part of a separate study within the SOMI-HE research.

Discussion

This study documents the research-informed IM process for the re-design and development of a mental health and PA promotion intervention programme for higher education students, known as SOMI-HE. The systematic steps of IM used as part of the SOMI-HE programme have successfully drawn on a variety of pedagogical approaches, through using evidence-based decision-making protocol, identified at each stage of the programme design (Bartholomew Eldridge *et al.*, 2016). Through the research-informed process of IM, the alignment of the SOMI-HE programme to the objectives, methods, and evaluation strategies has allowed for the creation of a rigorous and robust programme, aimed specifically at the targeted higher education student population. The research employed as part of step one in IM involved an extensive investigation into the modifiable determinants, regarding the low levels of mental health and PA participation among young adults (students) in higher education. The most prominent modifiable determinants for mental health and PA, selected as part of this study, include knowledge, attitudes, barriers, skills, motivation, outcome expectations, self-efficacy, and the perceived environment. These specific determinants concur with previously acceptable international wellbeing intervention studies (Ammendolia *et al.*, 2016).

IM as part of the revised SOMI-HE programme compelled the research team to foster innovative problem solving, however, the lengthy duration required in each of the steps in the design stage, particularly step one was of concern in terms of fluid research dissemination. The IM process, as part of the revised SOMI-HE programme, took approximately sixteen months for research design, development time, and the evaluation procedure as part of step six in the IM process is currently ongoing. This extended timeline for programme design and evaluation has been identified as a challenge by other researchers in the field, using IM (Ammendolia *et al.*, 2016; Mceachan *et al.*, 2008; Van Stralen *et al.*, 2008). In response to this lengthy duration of IM, the research team endorses that the process helped to minimise error, and fulfill a rounded, ecological perspective of the health problem, as part of the revised SOMI programme.

IM acknowledges that humans and human behaviours are part of a complex system (Kok, 2014), therefore, there are specific limitations within the environmental conditions of meaningful and sustainable behaviour change. An effective environment, or organisational level response for higher education students is to integrate the intervention within university/college courses, specifically as means of improving the outcome, as previously done within the PA-promotion construct (Plotnikoff *et al.*, 2015). In the current study, however, the research team did not have an association with the environmental agents of higher education for organisational change. In combat to this barrier, the revised SOMI-HE programme utilised an array of multi-theoretical approaches for intended personal behavioural changes (Kok, 2014), and worked locally to evaluate the programme.

In terms of sustained behavioural changes to mental health and PA participation for young adults, this IM process has found that the revised SOMI-HE programme could have been lengthened in terms of duration and dosage of frequency to improve the programme's potential impact to influence positive behavioural change. For example, within the field of mindfulness (a component of the revised SOMI programme), research suggests that even 3–4 brief sessions of mindfulness training can buffer negative mental health ill effects (Creswell, 2017). The current revised SOMI-HE intervention is only in a position to offer an experience of learning mindfulness twice, and therefore, has a low dosage of intervention exposure.

At this stage of the IM process, it is not possible to draw conclusions about the effectiveness of the revised SOMI-HE programme, however, the process is firmly rooted through a theoretically designed and research-informed approach. In terms of viability, the ratio of time spent designing the revised SOMI-HE programme, in comparison to the dosage and delivery time is exceptionally disproportionate in the context of higher education. Although the research team found the IM process to be exceptionally thorough and research-informed, specific stages, such as step three's creation of the matrices were challenging.

Conclusion

In this study, the authors provide a detailed description of how HEI's can use IM to develop a mental health, and PA programme, which specifically seeks to respond to the wellbeing needs of young adults in higher education. IM provides an opportunity to theoretically support intervention programmes for large cohorts of young adults in HEI's. This SOMI-HE three-hour programme is an innovative learning pathway for students, specifically the rigorous planning undertaken, research-derived protocol, and theoretically, novel pathways created between problems experienced by the target population, and their proposed solutions. The final product detailed in this study of the IM process is a blueprint to a programme known as SOMI-HE, which is created through intelligent design and content development, by various and relevant multi-sectoral stakeholders, invested in the wellbeing of young adults. The subsequent actions to follow include step five's implementation plan to create a method of effectively disseminating SOMI-HE, and step six's evaluation plan for examining the effectiveness of SOMI-HE. This will most likely require "buy-in" from senior leadership for the prioritisation of student wellbeing as an integral component of university strategic planning and policy, as previously flagged in the literature (Murphy, 2017; Thorley, 2017).

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Corresponding author
Niamh O' Brien can be contacted at: niamh.obrien@ucc.ie

What do parents believe are the causes of their Type 1 diabetic child's condition?

Alice Allan and Simon Rowlands
School of Health and Community Studies, Leeds Beckett University, Leeds, UK

Received 14 May 2019
Revised 22 February 2020
Accepted 22 February 2020

Abstract

Purpose – This paper aims to investigate parents' beliefs about the causes of their child's Type 1 diabetes to understand if this affects the way diagnosis is processed and if this impacts on sibling parenting.

Design/methodology/approach – Online, semi-structured qualitative interviews with nine parents of children with Type 1 diabetes who have at least one non-diabetic child. The results were analysed using interpretative phenomenological analysis (IPA).

Findings – Two interlinked themes were identified: "What ifs": parents postulated underlying genetic reasons for their child's diabetes and had working theories about the triggers of diabetes that included stress, infection, vaccination or a virus. Developing a personal aetiology of their child's condition allowed some a feeling of control, while others focused on practical ways to manage diabetes. "Having something to blame": narratives dwelt on the relationship between beliefs about causes and self-blame. Some believed that acting on an identified trigger reduced personal guilt.

Research limitations/implications – Although internet access is widespread in the UK, a limitation of this research is that it excluded those without internet access.

Practical implications – The findings of this research may provide greater depth and a more holistic perspective to the health promoter to better support parents of Type 1 diabetics.

Social implications – The analysis of illness narratives that this research provides may offer a greater understanding of the social context in which health and illness develop. This research found some examples of parental confidence about the causes and triggers of their child's diabetes being positively associated with a sense of control. This might indicate the value of a more comprehensive larger-scale study to establish whether parents who are supported to develop a personalised conception of the aetiology of their child's diabetes develop a greater sense of coherence and well-being regarding their child's condition.

Originality/value – There is very limited literature focusing on the beliefs of sufferers and their families about Type 1 diabetes causality. Of that which does exist, some research is heterogenous in its sampling of Types 1 and 2 diabetes sufferers. This study offers a rare, focused insight into the beliefs of parents about the background causes and more proximal triggers of their child's Type 1 diabetes.

Keywords Cause, Explanatory model, Type 1 diabetes, Lay belief

Paper type Research paper

Introduction

Type 1 Diabetes Mellitus (T1DM) is an incurable chronic condition that currently affects 400,000 in the UK (Diabetes UK). It can affect people at any age, but is often called juvenile diabetes. In 2016/2017, 2,807 young people aged between 0 and 15 years old were diagnosed with T1DM in the UK, an incidence rate of 25.4 per 100,000 population (National Paediatric Diabetes Audit, 2016/17).

Technology has improved psychological and health outcomes for T1DM in recent years (Kerr *et al.*, 2008; Misso *et al.*, 2010), but the condition demands extensive management, involving changes to diet and daily routine, which place considerable mental and practical burden on families (Jubber, 2013; Simms *et al.*, 2016).

Susceptibility to T1DM has an established genetic element (Bluestone *et al.*, 2010; Pociot and Lernmark, 2016), but environmental factors such as viruses, vaccine, diet and stress have all been posited as potential autoimmune triggers (Nygren *et al.*, 2015; Rewers and Ludwigsson, 2016; Rodrigues-Calvo, 2016; Knip *et al.*, 2018). As a result, causation is contested.

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Vol. 120 No. 1, 2020
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0965-4283
DOI 10.1108/HE-12-2019-0061

When disease is idiopathic, individuals are prone to personalise their own explanations (Herzlich and Pierret, 1987; Hunt and Emslie, 2001; Kangas, 2001). Bury (2001) notes that the rise of chronic diseases (such as diabetes) necessitates a re-evaluation of lay narratives to better understand these perspectives so that a more holistic form of patient care may be developed (Greenhalgh and Hurwitz, 1999).

Blaxter (2004) notes that what people believe to be the cause of their illness affects how they are likely to respond. Moreover, individuals' perceptions of the environment and themselves influence the way they act (Gana, 2001; Lezwijn *et al.*, 2011; Super *et al.*, 2016). As diagnosis of one child results in a higher risk calculation for siblings (Allen *et al.*, 1991; Harjutsalo *et al.*, 2005), it is important for the health promoter to understand whether parents' perceptions of T1DM causation impact on the way they raise other children.

At the time of their child's diagnosis, parents are susceptible to anxiety and depression (Wearden *et al.*, 2006; Cunningham *et al.*, 2010; Goldberg *et al.*, 2017). However, Antonovsky (1979, 1987, 1993) suggests that a sense of meaningfulness can be a protective factor. The way people attribute meaning to their disability/illness may also play a role in how they adjust to long-term conditions (Verhoof *et al.*, 2014; Pimentel *et al.*, 2017).

Parents' well-being is critical to the support they give as *de facto* managers of their children's diabetes (Eilander *et al.*, 2017; Johnson and Melton, 2014). Understanding parents' explanatory models about diabetes may enable the heath promoter to tailor health education and to avoid unhelpful tension in therapeutic relationships where professional and lay explanations are at odds.

Explanatory models for chronic disease

Lay beliefs about illness are often held to contradict the medical/rational view and have traditionally been derided (Furnham, 1994, p. 715) or used only as the basis for corrective education (Blaxter, 2004). The practice of seeking explanatory models was first used by medical anthropologists across various non-western cultures to understand the diversity of illness belief (Good, 1977; Helman, 1978). While lay accounts and explanatory models can differ from clinical models, Blumhagen (1980) and Kleinman (1987) note that patients' explanatory models are comparable to clinical models that explain illness. Warne and McAndrew (2007) suggest that patients are under-utilised as a resource for learning. Meetoo and Meetoo (2005) advise exploring the personal and social meaning that patients attach to their illnesses to facilitate negotiation with caregivers.

Much literature exists on lay explanatory models of Type 2 diabetes, but there is very limited literature focusing on the beliefs of sufferers and their families about T1DM causality. Some studies (Meetoo and Meetoo, 2005) heterogeneously sampled T1 and T2DM sufferers. Studies that did focus on T1DM were small scale; participants implicated genetic links, contagious illness, diet or parental error (Sunni *et al.*, 2015; Da Silva Pimental *et al.*, 2017).

Psychological responses of parents of Type 1 diabetics to diagnosis

The literature shows that mothers of children with chronic diseases are often the primary caregivers (Sherifali and Ciliska, 2006); much of the literature on parental psychological response focuses on mothers' experiences.

After diagnosis, mothers expressed disappointment, fear, anxiety, grief, injustice, shock, guilt and despair (Nelson, 2003). Whittemore *et al.* (2005) write that guilt is common to chronic illnesses. Rasmussen *et al.* (2008) suggest that mothers' feelings of guilt extend beyond diagnosis.

Loss of control is also a factor in parents' experiences of their child's diagnosis T1DM (Monahan *et al.*, 2011). Bandura (1997) writes that an imbalance between demand and a sense of control reduces the ability to cope.

Antonovsky (1979, 1987, 1993) indicates the importance of predictable and explicable internal stimuli and the availability of coping resources in developing a "sense of coherence" (SOC). Goldberg and Wiseman (2014) see this as a resource for parents at diagnosis, facilitating their journey from trauma to acceptance. However, Pianta *et al.* (1996) and Bury (2001) view diagnosis as an unpredictable experience that disrupts beliefs, emotions and perceptions of child/parent roles. Boman *et al.* (2004) report that feelings of loss of control among parents of children with T1DM are comparable with those of parents of children with cancer.

It has been shown that emotional and social support can help people deal with diabetes (Dunning, 1995; Rasmussen *et al.*, 2001; Rad, 2013). However, Rankin *et al.* (2014) found that different parents needed emotional and informational support at different times. Newell and Hahessy (2013) explored the positive impact of social support groups for diabetes, whereas Balkhi *et al.* (2014) found online forums for parents of T1DM diabetics offered support and stress in mixed measures.

Frank (1997) argues that illness narratives can be beneficial to the teller. Kangas (2001) posits that through sense-making, individuals attempt to answer questions about causation, and that giving an account of a condition can form part of how people cope with it. Park (2010) discusses meaning-making and its effect on adjusting to difficult life events. However, she concludes that more research is needed to ascertain whether those people who can provide a personal answer to questions of causation adjust better to adverse life experiences. Goldberg *et al.* (2017) also suggest a strong sense of coherence (SOC) allows parents of children with chronic conditions to perceive the disease as less menacing, their offspring as healthier and to help the child manage the condition better.

Methodology

The qualitative interviews in this study were analysed using interpretative phenomenological analysis (IPA) (Smith, 1996). IPA was deemed appropriate for eliciting and understanding psychological attitudes towards experiences among this under-researched group (Pietkiewicz and Smith, 2012). Informed consent was granted by all participants.

Sampling strategy

The research population for this study was parents of children with diabetes living in the UK, with at least one other non-diabetic child. The study sample aimed for depth and richness and consisted of seven mothers and two fathers. Participants were recruited from among the membership of a large British Facebook group called Parents of Children with type 1 Diabetes in the UK (membership 10,000). Ages ranged between 28 and 52 years. Time since diagnosis of their child varied from two weeks to 22 years.

A purposive sampling strategy was chosen based on the initial responses to a pre-questionnaire that were judged to have best addressed the study objectives. Although saturation is not normally the aim of IPA (Hale *et al.* (2007), at the individual level, saturation was determined to have been reached when the interviewer felt they had formed a full understanding of the participant's perspective (Legard *et al.*, 2003). Saturation was deemed to have occurred at a group level when the researcher observed the repetition of themes across participants' stories.

Methods

Extended, unstructured, asynchronous online interviews were conducted over instant messenger or email. This emerging method (Bowden and Galindo-Gonzales, 2015) has been

used to conduct research into hard to reach groups (Barratt, 2012; Synnot *et al.*, 2014). It is a cost- and time-efficient way of accessing views from a geographically diverse sample that met the research objectives (Opdenakker, 2006; Fontes & O'Mahony, 2008). Although it may miss those without online access (Egan *et al.*, 2006; Jowett *et al.*, 2011), internet coverage in the UK is increasingly high (Office for National Statistics, 2017). Although this method does not allow the interviewer to verify the identity of the respondent, rigour was enhanced by evaluating how consistent participants stories were to ensure trustworthiness (James and Busher, 2009). A large body of research justifies the use of email and electronic messaging (Jowett *et al.*, 2011; Hanna, 2012; Pearcea, 2014).

Reflexivity

In the case of the present study, it is acknowledged that the researcher is the parent of a T1DM sufferer with a non-diabetic sibling. It is inevitable that my own experience of exploring the many potential triggers of my daughter's diabetes has influenced my choice of questions, my development of themes and their interpretation.

Interview analysis

In keeping with the methodological need to present participants' authentic voices, transcripts were not altered, beyond removing identifying features.

Analysis consisted of five stages, as suggested by Smith *et al.* (1999). Firstly, a single transcript was read multiple times to ensure immersion, and ideas and insights were noted in the margin. Secondly, connections were made between these ideas and themes identified. Thirdly, a master list of themes was drawn up for the first case. Fourthly, all the other cases were individually analysed. Lastly, linkages were identified across the cases: for example, Emma's quote, "I wish I had listened"; Sue's, "I beat myself up for a while"; and Fiona's, "What could I have done differently?" had all been individually thematised under a title of "Feelings of blame and guilt", so these were merged together. A table of themes and sub-themes was created. All transcripts were re-read to make sure that the themes represented the original material (Ungvarsky, 2018).

Results

Two main themes were developed and are presented here.

"What ifs"

Uncertainty and working theories

A common theme was the degree of uncertainty experienced by parents around the triggers and causes of diabetes.

> With regards to not having a clear answer, it does leave a lot of what ifs, buts and maybes (Becky).

Several parents wrote of developing working theories to help them make sense of their child's condition, although all qualified them by acknowledging a lack of objective proof for their beliefs.

> . . .this is still just a hunch as there is no real clear idea about what the causes are (Simon).

Parents in this study were unanimous and explicit about the lack of agreed answers to questions about the causes and triggers of diabetes. However, they commonly wrote of developing their own way of making sense of diabetes:

> Everyone is on their own journey with T1, so everyone will have their own opinions and that's fine (Becky).

They referenced various sources for developing their own explanatory models. Some pursued systematic analysis:

> I'm a reader and have read six books about T1 to educate myself (Cynthia).

Others used different mechanisms, such as social discussion to inform their ideas:

> I also ask other parents of diabetics and weigh their experiences against my own. (Claire)

> I found a Mum of a 15-year-old boy who had been diagnosed a few years before, she's been so helpful with advice (Cynthia).

Medical staff as a source of information

Some parents predominantly based their views on information given by their hospital:

> The best info would be that provided by your own team as it's likely to be evidence based, relevant and up to date research (Sue).

However, some resentment of doctors' views of causation was expressed if it did not match parental experience:

> [I felt] surprise and then a bit of anger [about the idea that dairy consumption was linked to diabetes]. Amber was too young for diet to play any part (Malcolm).

This father concluded that *"a combination of genetics and environment"* was to blame.

Cynthia had filled in the gaps left by medical ambiguity:

> After reading up about the subject and linked viruses I'm nearly convinced [that] him having shingles before [had] something to do with it, I know there is no proof or connection! [. . .] Point I'm trying to make is that with the medical profession advice isn't always clear cut and you have to make your own decisions at times (Cynthia).

To illustrate, she mentioned having opted years previously for single doses of the MMR vaccination due to contradictory messages from doctors in the media/her own doctor about its safety.

Parents' relationships with medical staff on diagnosis were varied, and this appeared to affect the credence they gave to information coming from doctors. While most parents were relatively positive about their encounters with staff on diagnosis, of the 11 participants, four had a child who was initially misdiagnosed by general medical staff; this led to distrust in the abilities of medical staff:

> [The GP] told us to keep her topped up with Calpol to stop the temperature [. . .] We nearly lost her due to the severity of DKA [diabetic ketoacidosis] that she was in (Jackie).

Some parents were openly critical about the poor levels of knowledge and practice of general medical staff:

> GPs and hospital A and E staff often send away people displaying typical symptoms without doing a basic finger prick (Fiona).

However, parents were generally positive about care and information provided by their specialist teams:

> I had lots of opportunities to speak to doctors and consultants and the specialist diabetic team are amazing (Becky).

The majority of parents said that the triggers and causes of diabetes were only briefly discussed with medical teams.

> The professionals never mentioned the causes to me it was me saying to them what the causes or what I thought the trigger had been in this case (Emma).

Some felt that a lack of discussion was immaterial:

> Until they find a way to prevent it, recognising the cause will not help yet (Fiona).

Seeking information and sharing experiences

Some participants in this research found online diabetes forums allowed them to identify similarities with other families, which helped them to explore alternative patterned narratives beyond the medical and legitimise parental explanations:

> They highlight recurrent similarities surrounding the kids prior to diagnosis (Claire).

Some parents in the study appreciated the practical support that online groups provide, rating the experiences of living with T1DM as more meaningful than a disconnected medical perspective.

> I find a lot of time that people living with diabetes or parents of diabetic children have a wider knowledge base than the doctors as we live with the practical, and not just the theory side of it (Claire).

Fiona singled out one nurse as superior because of her personal experience of T1DM:

> The nurse used to be type 1 but had a pancreas transplant a few years ago. It's great to have someone on the team who has lived with the condition as she truly knows what we are all going through.

However, most fathers and mothers valued medical knowledge as superior, relegating lived experiences and "old wives" tales.

> Like all these sites on all topics some are legitimate and others just postulating on theories with no background (Simon).

The perceived causes of T1DM

As the early section established, the causes of T1DM are largely unknown. Parents views echoed the literature in the main, with most parents expressing the belief that an underlying susceptibility to diabetes existed before diagnosis.

Others expressed the idea that the body had attacked itself:

> T1 is an autoimmune disease, so her genetic makeup meant a predisposition to self-attack when fighting a foreign virus (Malcolm).

Several parents put forward the idea of an overloaded immune system:

> I think it was a culmination of Tilly having slapped cheek and scarlet fever over such a short period of time which was just too much for her immune system to cope with (Becky).

Becky cited her consultant and corroboration on forums for this belief.

One mother pointed to medical intervention as exacerbating immune overload. Emma's son had an infected finger, and when she took him for treatment, she was persuaded to also get him vaccinated with the MMR.

> . . .she told me there was no risk and my thoughts were incorrect [...] By pushing his immune system, I believe we pushed his system over.

Interestingly, it was a video about the possible viral triggers of T1DM shown at her hospital that led her to draw a link to vaccinations. Like Cynthia, Emma mentioned having previously opted for individual vaccinations for her eldest son, indicating that lack of faith in one area of health information may lead to a greater tendency to be critical.

Across the rest of the parent group, the condition was attributed to a variety of triggers. Some postulated a combination of a virus or infection, a vaccination or stress caused by the death of a relative. Jackie believed her second daughter's trigger to be a wasp sting.

> She was violently sick in the car after a nice day out [. . .] We then went to the local GP surgery, and from there we were sent straight to hospital.

Parents narratives showed them to be extremely alert to changes in their child's behaviour:

> The first symptom I saw was in behaviour [. . .] then he got boils on his legs [. . .] Then he became incontinent. . . (Emma).

Several parents provided evidence that was based on personal knowledge of their child's behaviour for the beliefs they held that questioned medical rationale. Simon rejected one of the theories his hospital provided based on his personal observation of his daughter:

> In terms of a virus we thought this unlikely as we had no evidence that she had a virus around that time.

He identified instead a period of stress due to bereavement and changing schools, which he felt may have acted on his daughter's weakened immune system.

Overall, there was no consensus on causation. Some views aligned with medical explanations, but some responses challenged doctors' views and even implicated medical intervention (vaccination) as part of the problem. These respondents cited multiple sources of information, ranging from the internet to parent forums, which they corroborated with reference to personalised factors.

Finding a way of coping

Parents talked about a loss of control and normality on diagnosis:

> . . .the bottom had fallen out of my world (Claire).

> Life would never be the same again (Malcolm).

Most parents reported that in time, diabetes had become normalised:

> In terms of how we feel now compared to diagnosis it has obviously become part of our lives... (Simon).

However, in this study, two mothers reported feeling continually overwhelmed and exhausted by the condition:

> . . .with diabetes it's a life sentence, there is no end to it (Fiona).

> "I thought it was going to be hard, but manageable. Now, I feel like they have a life sentence (Claire).

Both these mothers expressed fatalism about causation and were pessimistic about their inability protect their other children.

Several others preferred to focus on managing the condition with technology or a pragmatic approach rather than think about causation:

> It would be great to have some answers in years to come as to why, but thinking about it too much is a head f..k to be honest, so I donate each month to JDRF UK . . .[it] helps me deal with it and process it all (Cynthia).

In contrast, others believed that having a sense of what caused T1DM can help parents:

> I think it helps some people process the diagnosis and make sense of it [. . .] It can help you "grieve" the loss of your healthy child and provide closure (Sue).

Others thought that parents were driven to understand the triggers of diagnosis from a drive to protect their other children:

> I feel parents want to know what may have triggered their children's diabetes so they can keep a check on their other children (Claire).

However, despite having working theories about the triggers of their children's diabetes, the majority of parents believed there was nothing they could do to prevent their non-diabetic children getting the condition:

> I do not do anything differently to prevent the other 2 from getting it because I do not know how! (Fiona).

She echoed medical explanations by identifying her son's many viral infections as a trigger. However, both respondents who postulated vaccinations as a trigger acted to reduce the perceived effect on their other children, showing that beliefs about the triggers of T1DM have the potential to impact on behaviour:

> We consulted with both our GP and our diabetes team and agreed that we could delay the [MMR] injection until she was older so that we were mentally and emotionally prepared to take on another child with diabetes (Jackie).

Emma's belief in viral overload led to her attempting to mitigate this perceived risk, using her intimate knowledge of her children as a guide:

> If going through puberty I am not going to vaccinate you and further compromise your system. If you are unwell I will not vaccinate you and I will not allow for multiple vaccinations at a time, vaccinations will only occur if the child is well.

Emma stated that her identification of her son's trigger (she perceived viral overload from vaccinations to have triggered her son's diabetes) was fundamental to her coping strategy; it allowed her to feel she could mitigate a situation that others saw as unpredictable or inevitable:

> Understanding the condition means I have less fear for my other children. . .I can actively try and reduce the chances of them overloading their system.

Interestingly, while Jackie believed that her second child's diabetes was triggered by a wasp sting, she was unconcerned when her non-diabetic was later stung, suggesting that beliefs do not consistently influence actions, or that certain beliefs are contextual:

> we didn't do anything about wasps, and she did get stung but it didn't even cross my mind when it happened.

"Something to blame"

Self-blame

In this study, parents articulated mild levels of self-blame that focused on the period surrounding diagnosis. Some expressed regret about not picking up on the symptoms more quickly:

> I beat myself up for a while after diagnosis for not taking him to the GP sooner (Sue).

Fiona blamed herself for having a genetic predisposition to autoimmune conditions:

> I do shoulder some blame for it, as I too have an auto immune disease.

A recognition of a hereditary susceptibility to T1 was linked to a sense of fatalism, with varying levels of personal guilt felt across the sample. Most parents saw diabetes as unpreventable:

> You cannot lessen a chance of an autoimmune condition like T1, you can stop smoking to lessen your chances of cancer. . .but there is nothing to lessen with T1! (Cynthia).

Blame of medical staff

While many praised the quick responses and support of their specialists, several participants blamed medical staff, either for poor management of the diabetic child's condition or for their attitude towards the parent.

> I told my husband he had to take her to the GP as the Dr had upset me last time I saw him (Claire).

Although Jackie's doctors negotiated a revised schedule for her daughter's MMR vaccination that reflected her beliefs (and associated anxiety) about T1DM causation, Emma expressed transactional frustration with medical staff who would not corroborate her beliefs about the trigger of her child's diabetes:

> . . .they make me feel like I'm stupid for considering trying to reduce my children's exposure to possible triggers (Emma).

Lifting of blame

Some parents indicated that identifying a trigger was an important step in removing self-blame:

> I think people want to know what caused it so they do not blame themselves (Fiona).

> I'm not sure how we would feel not having something to blame! (Jackie).

Emma found that acting on her identified trigger reduced her feeling of blame:

> The guilt when you find that a genetic factor is a major reason is terrible but having information to possibly stop, reduce or prevent it in my other children is empowering.

Some participants indicated that having a personal sense of what triggered their child's T1DM helped them to counter public ignorance:

> I'm not sure I've properly started processing the diagnosis yet, but when clueless people ask if it's from eating too many sweets I generally fire back about the scarlet fever (Becky).

Discussion

Bury (1982) notes that while medical conceptions of chronic disease are expected to give certainty during times of disruptions, they often turn out to be limited, creating uncertainty about causes and scepticism of medical expertise (see also Calnan and Williams (1996)). In this study, while it was evident that lay belief is heavily influenced by medical rationale (Bury, 2001; Shaw, 2002), it was also clear that, due to incomplete medical explanation, parents not only evaluated medical advice in the light of their personal understandings and interpretations of the aetiology of their child's condition, but that these personal "sense-makings" were infrequently discussed with medical staff. Continued frank and non-judgemental discussion with parents could lead to greater understanding of the

parent's perspective, greater integration of the child's condition into the family narrative and potentially greater well-being.

In the case of this study, the two mothers who altered their behaviour towards their non-diabetic child did so on the basis of their beliefs about the dangers of the combined MMR injection. Contradictory information about vaccination also contributed to other parents' scepticism of medical views. While accepted medical practice is that vaccinations and their timing are not linked to developing T1DM (DeStefano *et al.*, 2001; Beyerlein *et al.*, 2017), some authors (Classen, 2008) posit a link. Although this is disputed, concerns about "viral overload" from vaccinations are still widely held (Hilton *et al.*, 2006; Pearce *et al.*, 2008), suggesting that greater public education and efforts to build trust in medical opinion are needed to dispel fears. Although Good and Good (1982) recognise that if a medical practitioner is able to validate a patient's explanatory model, it enables them to better negotiate a care plan, there is a clear tension between corroborating patient's explanatory models and potentially validating harmful belief or encouraging unnecessary, costly or harmful behaviour.

Poor communication with medical staff exacerbated the difficulty of caring for a diabetic child for several of the parents, confirming that for some, physician-related distress is a key element of diabetes burden (Polonsky, 2005). The study suggests that respectful communication and an open and trusting relationship with medical staff are critical to the reception of messages and to the development of practical and emotional coping skills among parents (Watzlawick *et al.* (1967).

In this study, several mothers expressed feeling trapped and exhausted. Sullivan-Bolyai *et al.* (2004) identify that many experience a state of constant vigilance following their child's diagnosis, and Lindström *et al.* (2017) reported that it is mothers who are most likely to experience "burn-out". Although Dashiff *et al.* (2008) reported that, typically, fathers use the coping strategy of distancing more than mothers, and Mitchell *et al.* (2009) found that many fathers self-report that they are only mildly affected by their child's condition, in this study, parents of both genders were both emotionally affected and actively engaged in practical management and information seeking around diabetes.

Wennick *et al.* (2009) write that after three years, families in their study had mostly normalised the role of diabetes in their lives. However, while they acknowledged a degree of normalisation, parents in this study expressed enduring elements of anger, guilt and grief relating to the T1DM diagnosis. Caregivers should be cautious, therefore, about assuming that duration since diagnosis, or ability to practically manage diabetes equates to parental equanimity.

Feelings of guilt in the aftermath of diagnosis of a child with a chronic illness are common (Whittemore *et al.*, 2005), and Betschart (1987) points to particular parental guilt about their children's blood sugar control. In this study, several mothers indicated lasting feelings of guilt around the causation of their child's condition, particularly if there was an inherited genetic disposition to T1DM. This could indicate more need for counselling, akin to genetic counselling, when a child is diagnosed. This study had limited access to the views of fathers, and the results echo the view of Dashiff *et al.*'s (2008) that the voices of fathers in relation to chronic illness have not yet been adequately studied.

Conclusion

The diagnosis of a child with T1DM is a disruptive life event. When illness interrupts individuals' life stories, Bury (1982) notes that their material and cognitive resources are highlighted. This research sheds light on the way that individuals incorporate medical belief and more personal, contextually derived perceptions to explain the aetiology of their child's diabetes. It adds to the limited literature exploring parents' beliefs about T1DM's causation and underscores the importance of investigating lay belief, not least because these beliefs

often have psychological or behavioural ramifications. Thus, while the medical model can offer (some) biological explanation of T1DM, the analysis of illness narratives that this research provides may offer a greater understanding of the social context in which health and illness develop and may provide greater depth and a more holistic perspective to the health promoter to better support parents of T1DM sufferers (Rose and Gidman, 2010).

This research found that parents' explanatory models of their child's diabetes were based predominantly on medically derived theories, particularly in relation to background-level causation, which was viewed to be caused by genetics. However, in relation to more proximal triggers, although these beliefs were heavily qualified, the parents in this study personalised the aetiology of their child's illness with information based on their intimate knowledge of their child. All parents in this study found the medical uncertainty around causes and triggers frustrating or stressful, and in the light of the absence of concrete answers, had developed working models to theorise about their child's situation, some of which challenged the views of their medical caregivers. For some, the ability to attribute the condition to a particular event proved psychologically helpful, while for others, it felt immaterial in the face of the absence of a cure. While most parents' beliefs about causation had no impact on the way they raised other children, two mothers reported changing immunisation scheduling to reflect their causation beliefs.

Recommendations

(1) More research is needed into what parents (including fathers) and sufferers believe are the causes of T1DM and how this affects their processing of diagnosis.

(2) This research found some examples of parental confidence about the causes and triggers of their child's T1DM being positively associated with a sense of control. This might indicate the value of a more comprehensive larger-scale study to establish whether parents who are supported to develop a personalised conception of the aetiology of their child's diabetes develop a greater sense of coherence and well-being regarding their child's condition.

(3) Diagnosis of a child with T1DM is a time of transition. More psychological support for parents of children who are diagnosed with T1DM, with an emphasis on listening to their intimate knowledge of their child, would engender stronger relationships with caregivers, helping parents mediate stress, facilitating better acceptance of the health condition.

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Corresponding author
Alice Allan can be contacted at: amehackett@hotmail.com

Sexual and reproductive health in schools in Fiji: a qualitative study of teachers' perceptions

Sharan Ram and Masoud Mohammadenzhad
School of Public Health and Primary Care, Fiji National University, Suva, Fiji

Received 4 February 2019
Revised 15 August 2019
16 December 2019
Accepted 10 February 2020

Abstract

Purpose – Teachers are a key to success for school-based sex health education programmes; however, they may not be able to consistently implement it due to a myriad of reasons. This study aimed to explore the perceptions of teachers regarding the delivery of sexual and reproductive health (SRH) education in secondary schools in Fiji.

Design/methodology/approach – A qualitative study design was used to collect the data from SRH education teachers in Suva, Fiji between July and August 2018. This study included teachers who taught sex education for at least two years. Five focus group discussions (FGDs) were run using a semi-structure questionnaire among groups stratified by gender. Data collected were transcribed verbatim and thematically analyzed.

Findings – The study findings reveal that implementation of SRH education is vague, not mandatory and not comprehensive. Teachers acknowledged that SRH was not adequately covered in homes and underscored its importance for young people. Teachers viewed schools as ideal place for delivering sex education, however, could not consistently implement due to a lack of adequate information and skills, feared negative parental reaction, felt uncomfortable delivering sensitive topics and in most cases felt apprehensive to discuss sexuality issues in light of lack of training and resources.

Originality/value – To improve SRH education delivery, there need to be a focus on strengthening capacity building of teachers through pre-service and in-service health education, improved monitoring, evaluation and context–specific resource development and allocation.

Keywords Sexual and reproductive health (SRH), Sexuality and relationship education (SRE), Qualitative study, Secondary schools, Teachers, Fiji

Paper type Research paper

Introduction

Worldwide, adolescent sexual and reproductive health (SRH) remains a challenge. Key SRH issues that affect young people are puberty, pregnancy, access to modern contraceptives, unsafe abortions and violence including gender-based violence (UNESCO, 2018). SRH can be taught as part of sex education (Fentahun *et al.*, 2012). Comprehensive sex education (CSE) leads to improved SRH, resulting in the reduction of sexually transmitted infections (STIs), human immunodeficiency virus (HIV), and unintended pregnancy. It also promotes gender equality and equitable social norms and has a positive impact on safer sexual behaviors, delaying sexual initiation and increasing condom use (Chin *et al.*, 2012; UNESCO, 2015c). However, despite clear and compelling evidence for the benefits of high-quality, curriculum-based CSE, few children and young people receive preparation for their lives that empowers them to take control and make informed decisions about their sexuality and relationships freely and responsibly (UNESCO, 2018).

Schools are one of the best avenues to reach adolescents with SRH information and where sexuality and relationship education (SRE) can be taught systematically and comprehensively (Ellington, 2016; Fentahun *et al.*, 2012; Hettiarachchi *et al.*, 2009). Teachers

The authors would like to thank all the teachers who voluntarily participated in the study. We would also like to thank Dr. Sari Andajani for her advisory input and encouragement.

Health Education
Vol. 120 No. 1, 2020
pp. 57-71

0965-4283
DOI 10.1108/HE-02-2019-0005

are the key to the success of school-based sex-education programmes (Ahmed *et al.*, 2006). However, the literature suggests that teachers may not be able to consistently implement this because of a myriad of reasons. This includes lack of adequate knowledge about SRE, the values, beliefs and culture which shapes the attitudes of the teachers toward sex education and the type of sexuality education that needs to be talked about, whether it is comprehensive, abstinence-only sex education or mixed, poor attitude toward sex education and teachers not being confident and comfortable to teach sex education (Westwood and Mullan, 2007). Due to these reasons, teachers have difficulty implementing SRE programmes. Equipping them with the knowledge and skills to effectively teach a sensitive range of topics necessitates emphasis on specialized and effective training (Alldred *et al.*, 2003; Helleve *et al.*, 2009; Iyaniwura, 2003; UNESCO, 2015a). Studies in the USA have shown benefits of CSE over abstinence-only education. Abstinence-only education has failed to prevent teenage pregnancies, and it is positively correlated with increases in teenage pregnancies and STIs and is considered highest in the USA amongst the developed countries (Carter, 2012) thus there is an emphasis on CSE (Weiser and Miller, 2010).

In the Fijian education system, SRE is offered to students from Years 9–13 (aged 14–18) to prepare students to make informed decisions regarding sex and relationships (Fiji Islands Education Commission/Panel and Fiji Ministry of Education, 2000). It was implemented by the Ministry of Education (MoE) in response to high teenage pregnancies and STIs and the subject was named family life education (FLE) as the term "sex education" was deemed sensitive by the stakeholders (Kondo, 1985). Among the different sectors of schools in Fiji such as government, faith-based schools (example Catholic, Methodist) and private schools, SRE promoted but is not mandatory across all sectors. The key focus of the SRE curriculum is the names and functions of sexual and reproductive body parts; Reproduction (babies, pregnancy and birth); Contraception and family planning methods; HIV and AIDS and sexually transmitted infections; safe sex practices; relationships and feelings; managing peer influences; sexual decision-making and sexuality and gender.

The implementation of SRE as part of the national health curricula in Fiji has led to improved adolescents SRH outcomes. Because of the intimate and personal aspects that are involved, sex education has a reputation as a sensitive subject (UNESCO, 2015a). In addition, this subject is considered taboo in both the iTaukei and Indian (Indo-Fijian) culture and rarely discussed at home. Thus, the responsibility of providing SRE is shifted to schools and teachers. Educational training on sexual health topics has been identified as the main prevention strategy (Mohammadnezhad *et al.*, 2017).

Research has shown that Pacific Island Countries (PICs) students generally viewed school programmes as important sources of information about SRE. It also showed that teachers were skeptical about what content to teach due to sensitivities surrounding the topic and were uncomfortable in content delivery; however, students insisted that they are provided CSE. This also received approval from the parents (UNESCO, 2015a).

A UNESCO study conducted among four PICs prior to the implementation of the SRE in 2008 provided data on HIV and SRH knowledge and behavior of 13–15-year olds identified significant gaps in the knowledge of SRH of students. The study showed that SRE teachers known as FLE teachers in these countries were neither specialists nor trained teachers to deliver the SRE curriculum. As such they are usually skeptical about what (content) to teach due to culturally sensitive topics or were uncomfortable to teach certain content due to lack of appropriate training (UNESCO, 2015a, 2015b).

Since SRE has been in implementation for a decade with limited success in many PICs (UNESCO, 2015a), it is imperative to investigate its status and facilitate improved delivery. Thus, this study was designed to explore the perceptions of sex education teachers regarding the delivery of SRE to students in Years 9–13 (aged 14–18) and inform strategies for improvement in Fiji.

Methods

Study design and sample

This study utilized qualitative research methods to collect data using focus group discussions (FGDs) in Suva, Fiji between July and August 2018. The target population was FLE teachers in Suva, Fiji teaching SRE in mainstream public secondary schools irrespective of their gender and age. The study excluded all other teachers or any FLE teacher not willing to participate in the study.

Sample recruitment

A list of schools was obtained from MoE and schools with equal ethnic mix were selected to ensure equal representation from the two major ethnicities. A total of 12 schools were approached of which eight allowed the study to be conducted. However, data were collected from only five schools. To recruit the teachers, the school principal's permission was first sought. Following this, the researcher met the FLE subject coordinator who organized a small meeting of the FLE teachers. A brief oral presentation on the rationale and significance of the study and its potential benefits was done to the teachers At the end of the presentation, those willing to voluntarily participate were provided with a consent form and information sheet. A suitable time was agreed for the FGD with the FLE teachers.

Data collection tool

A semi-structured open-ended questionnaire was used to guide the FGD. The data collection tool (semi-structured questionnaire) was adapted from a similar study conducted in four PICs in 2015 (UNESCO, 2015a). The FGD guides were piloted in Fiji and as such, it was accepted as a validated tool. As the guides have been slightly amended by removing questions directed to primary school teachers (such as contents taught in primary school), it was post piloted with a group of four high school teachers, however, no amendment was made post piloting.

FGD procedure

Five FGDs were conducted amongst the FLE teachers. The number of participants in each group varied as shown in Table 1. For instance, one school had only three teachers to deliver FLE who formed a FGD. In total 21 teachers participated out of which five were males. FGD amongst the mixed-gender group was facilitated by a male research facilitator whilst a female research facilitator facilitated groups with two female-only groups. Both the male and female researchers were bilingual and had previous experience in conducting FGD.

The researcher strived to ensure that the room was a quiet, cool and non-threatening environment conducive for discussion with the group. It was acknowledged that issues about SRH are sensitive, in view of which the privacy of the respondents was given serious consideration. In this regard, the researcher strived to stratify the FGDs by gender to encourage openness and gendered–specific sensitive responses from the participants,

Focus group number	Gender and ethnicity	No. of participants
Focus group 1	Mixed gender and ethnicity	3
Focus group 2	Mixed gender and ethnicity	5
Focus group 3	Females and mixed ethnicity	4
Focus group 4	Females and mixed ethnicity	4
Focus group 5	Mixed gender and ethnicity	5
Total		21

Table 1. Demographic characteristic of participants of the FGD

however, teachers welcomed the mixed group and only two single-gender groups were possible. Each FGD lasted approximately 40 min and was recorded using a digital audio recorder. FGDs were terminated once there was data saturation.

Trustworthiness was incorporated in this study by using Lincoln and Guba's (1985) strategies. For instance, creditability was ensured through peer scrutiny, providing thick descriptions of the phenomenon under study and ethical approvals; transferability was ensured by providing detailed descriptions to allow comparisons to be made with similar studies; dependability was ensured by using in-depth methodological descriptions to allow the study to be repeated while conformability was ensured by avoiding investigator bias by creating an audit trail (Anney, 2014).

Data analysis

Audio-recorded FGDs were first transcribed into English verbatim. The transcribed data were read and re-read to identify key categories/ themes and data were summarized under appropriate categories (Green *et al.*, 2007).

Ethics approval

Ethical approval was sought and granted by Fiji National Universities' College Health Research and Ethics Committee; the Fiji National Research Ethics Committee of the Ministry of Health and from the Fiji Ministry of Education, Fiji. Due consent was obtained from the participant regarding the audio recording of FGD and they were assured anonymity.

Results

Sample characteristics

A total of 21 teachers (five males) participated in the FGDs. Due to lesser male FLE teachers, three mixed-gender FGD was conducted while two females only FGDs were conducted. A breakdown of the demographic characteristic is shown in Table 1.

The subheadings in this section are as thematic areas deduced from the analysis with teachers' voices captured under relevant themes. The results showcase the current status of SRE in secondary schools in terms of curriculum content, teacher training and provision of SRE in same-sex classes. The findings highlight the grave importance of CSE and the role of ministry in providing and supporting SRE. It briefly touches on the level of parental involvement and ends with how teachers feel SRE can be delivered.

Current HIV and SRE in selected public secondary schools

The study found that SRE in public Fijian secondary schools is not implemented in a mandatory fashion. There are varying methods/models of implementation. In the majority of the schools, SRE classes featured once a week in the timetable of the students of all the levels (Y9-Y13) and the duration of the session ranged from 40 to 60 min. In a few schools, the weekly SRE class alternated with the "Careers" class. In some schools, it is offered to Y9 students only. In one school where it was offered to year nine students only, the school principal stated the following:

> We only offer SRE in Y9 because we have too many activities in the school. From Y10 onwards, we have to give priority to vernacular language classes as well as religious classes and as such we cannot accommodate SRE classes at all the levels. [Principal, Interview. 18 July 2018]

Even in schools where SRE class featured once a week and were offered at all levels, implementation depended on teacher's availability and other school activities. For example, in an event, the SRE teacher was absent, there was no replacement teacher to facilitate the session even though currently teachers did not have to be specialist to be able to teach SRE

and whenever exams were close, teachers mentioned that SRE classes were used as revision classes to prepare students for the exams. For instance, one female teacher stated:

> When we have exams or other programmes like religious activities the SRE class is forfeited. [iTaukei female teacher]

There is no special teacher training for FLE teachers thus any teacher can be given charge for the SRE classes. In the majority of the schools, the SRE classes were delegated to biology (life science) teachers since biology dealt with topics such as human anatomy, reproductive system, conception, contraception, teenage pregnancy and drug use. In most of the schools, SRE was assigned to teachers based on a teachers' workload (number of classes per week). For instance, if a teacher is required to teach 36 h in a week and had only 32 h of academic teaching load, then s/he was given 4 h of co-curricular classes such as SRE, careers or physical education. Teacher's academic/subject expertise was not considered when delegating them SRE classes. In one school, all SRE classes were given to their two social science teachers so that these two teachers, apart from teaching social sciences could focus solely on SRE. Some SRE teachers were also found to be from commerce background and claimed to be least knowledgeable of the subject.

Of all the schools that participated (five), only one school offered SRE separately to male and female students. This was because of the religious/conservative nature of the school. This was a Muslim school and the principal mentioned that due to the sensitive nature of the subject in Islamic society, separate classes were being convened for males and females. Other schools had SRE classes conducted together for both male and female students at all levels (Y9-13).

In schools co-educational SRE classes, teachers preferred that certain lessons, such as those that dealt with reproduction and the reproductive system, conception and contraception be conducted separately as it was deemed sensitive in nature.

Teachers also mentioned that they would feel more comfortable to discuss openly on SRE if they had to teach students of their own gender. One female teacher expressed that:

> It would be better if we females teach females and the male teachers teach males, and then we will be more open to the females. [Indo-Fijian female teacher]

Female teachers said that they found it difficult to open up to the male students. Teachers felt that having a one-hour per week SRE class is sufficient if it is used for the purpose it is allocated. In schools where SRE was being offered in alternative weeks, teachers felt little more time was needed for the subject given that sometimes the classes were forfeited to accommodate other activities. Teachers mentioned that there has been a high interest among students regarding SRE.

Across all focus groups, all teachers were in favor of the provision of SRE in schools and said that it was crucial to have SRE in schools as they acknowledged that SRE was not discussed openly in the majority of the homes as it is still considered a taboo.

Need for sexuality and relationship education

All teachers agreed that teenage pregnancies and STIs have become a very serious social and health concern in Fijian communities and said that SRE must be provided in schools. One male teacher, justifying the importance of SRE said:

> It is important to enlighten students on SRE so that they are aware of bodily changes going on and understand any problems associated with it in future [iTaukei male teacher]

Although teachers agreed on the importance of the need for SRE, the majority said they were not comfortable discussing sensitive topics (such as conception, contraception and STIs) with students and when they did, they thought students might take it as a joke, as embarrassing or

inappropriate. One male teacher stated that he did not feel comfortable to talk about SRE subjects with girls in his class as he did not want the girls to take it wrongly:

> In my Y11, there are plenty of girls, so I do not touch on those sensitive topics. The girls can take it wrongly, so we just discuss other topics such as drugs and peer pressure. [Indo-Fijian Male teacher]

Majority of the teachers, both male and female, mentioned difficulty teaching contraceptive topics. All the teachers said that it would be difficult or impossible to bring into a classroom any contraceptives (example condom) and have a demonstration on how it is used. SRE teachers with science backgrounds were able to teach concepts on reproductive systems, conception and contraception better than teachers from other disciplines. Some teachers said that the reasons for feeling uncomfortable in delivering sensitive SRE topics such as contraception were related to personal or religious beliefs and gender differences between teachers and students and fear of potential negative reactions from parents. A female *iTaukei* teacher, who said that she had strong Christian beliefs, stated that:

> When it comes to contraceptives, according to my Christian beliefs is like promoting [encouraging] sex before marriage and it is not allowed. Therefore, I am uncomfortable teaching the types of contraceptives and how it is used. It is against my belief. [iTaukei Female Teacher]

Another female teacher noted that:

> We only teach those topics which we are comfortable with. When we see some topics we are not comfortable with, we do not teach. I particularly find teaching reproduction uncomfortable. [Y12 iTaukei Female Teacher]

Another female teacher found it hard to engage male students on SRE topics, as they would feel embarrassed to participate.

> I feel that when I teach Sexual Reproduction topics to Y13, the boys are particularly shy. [Y13 Female Teacher]

Teachers said that although they felt uncomfortable delivering SRE, they unanimously, across all five focus groups, agreed that it must be taught in schools to address unplanned teenage pregnancies, STIs and HIV prevention. All teachers mentioned that they understood such topics including monogamous relationships and the effects of having multiple sex partners were rarely talked at homes. One teacher said:

> All the topics should be discussed thoroughly with both males and females. Only in school, children can be made aware of those things. I think families hardly talk on sex-related topics at home, so it's good to create awareness at an early stage in school. [Indo-Fijian male teacher]

Some teachers expressed that some students were not very serious on the topic because they knew that the knowledge about SRE would not be examined and they could do away with it as a female teacher stated:

> Last year in my class when I mentioned the concept that would be discussed at the beginning of the SRE session, one student commented, "Madam this topic is not tested, we do not have to sit for the exam." Therefore, when the students have that kind of attitude about a particular subject then it becomes very hard for us to motivate them to learn. [Indo-Fijian female teacher]

All teachers believed that the information students received during SRE were very useful and that the students were particularly keen to know the life experiences of the teachers as one Indo-Fijian male teachers stated:

> I think the information we provide during the class is very useful to the students. Some topics are well received by students however they do not pay a lot of attention to other topics. For example, students seem to eagerly await to hear on topics such as "relationships", and what we (teachers) are

> going to say and they hope we are going to give them something extra so they always looking forward to those types of topics. They are keen to hear our experiences, like what we teachers did or did not do when we were their age. [Indo-Fijian male teacher]

Support from the Ministry of Education

According to the teachers, they have only one SRE guidebook for teaching SRE for all the levels i.e. for Y9-13 in secondary schools provided by the MoE. There are no other resources published by the MoE to help teachers for instance regarding the methods of delivery. All teachers agreed that there was a "scheme of work" (SoW) for each subject which is a detailed plan, usually in a tabular form that defines *work* to be done/concepts to be covered in the classroom on a weekly basis; however, it did not exist or developed for SRE. Thus, teachers used their personal judgment on what was suitable for a level in choosing the study topics or key concepts in their teaching.

Of the 21 teachers that participated in the study, only two female teachers (one with seven years' experience while the other had 27 years of teaching experience) mentioned ever attending a workshop on SRE. Teachers mentioned that they did not receive any pre-service or in-service training on how to facilitate SRE classes resulting in teachers skipping sensitive topics as they were not comfortable delivering it. The majority of the teachers felt that they were being forced to teach a subject they were not comfortable teaching in an absence of lack of specialized training. All teachers were critical that the MoE has not been convening frequent workshops for SRE teachers where they could upskill themselves and teach better. Some teachers mentioned that in the absence of any training they had to spend a great deal of time preparing to teach just a single SRE session.

One Indo-Fijian female teacher, who had difficulty facilitating SRE sessions shared:

> In SRE, there are sensitive topics and sometimes I stress myself thinking about all that I have to teach because of having both genders in the class. Sometimes I feel restricted from speaking out whatever we have in the syllabus. We do not have that much confidence to deliver the content. I have also seen my other female colleagues stressing themselves about the (sensitive) content that they have to teach. [Indo-Fijian female teacher 1]

In terms of the support from the MoE, teachers made several remarks as follows:

> The MoE only provided SRE textbooks and leave everything on us. SRE started in the 1990s and still, not much progress has been made by MoE regarding training and resources in this subject. [Female Indo-Fijian Teacher 2]

> I think its high time ministry should organize workshops which will equip us to teach the subject better and teachers can take turns in attending the workshops. [Female Indo-Fijian Teacher 3]

> I think SRE should be taught by one person in the school so that the designated teachers can focus on just one subject. He/she can attend the workshops and would know what to teach and how to teach. We are just given these topics suddenly and a lot is being expected from us. [Female Indo-Fijian Teacher 4]

All teachers felt that specialist teachers or those who are trained should deliver the SRE then only they feel justice will be done to the SRE classes. One teacher stated that:

> I think if specialized teachers teach SRE, the delivery of the lesson will be very good compared to what we are doing. [Indo-Fijian male teacher]

All teachers mentioned that they need more support and resources or teaching aids from MoE (such as charts, pamphlets, video clips and short movies) and teacher training and refresher course. Some teachers said that some NGOs visited and provided some appropriate videos on

SRE, but the schools did not have a multi-media equipment has to show the videos to the students.

Parental involvement in SRE delivered schools

All teachers mentioned that currently there was no opportunity for parents to be involved or have a say regarding the teaching of SRE. All teachers, however, were in favor of involving parents to make them aware of SRE and how they could contribute as one teacher stated

> It will be good if parents are involved with us so that they can reinforce what is discussed in school. [Indo-Fijian female teacher]

Age-appropriate incremental sexual and relationship education

All teachers agreed that sex education content should be incremental beginning at the primary school level with some basic health education and the content should be more in-depth (age-relevant) and gender-sensitive as students progress up the levels. Teachers mentioned that some topics are introduced to students from Y3 under the subject of family health. Teachers felt that sensitive components of SRE should start at Year 7 (age 12) or at the onset of puberty.

> It is important that parents provide some education at home and when children enter primary school, they get basic health education and as the children move to the upper level more and more information is taught to them. [Indo-Fijian Male teacher]

The sensitive component of SRE was topics that needed to refer to the genitalia/ reproductive system such while discussing reproduction and using contractive methods.

Barriers and facilitators for the delivery of SRE

Findings demonstrate that there are fewer facilitating factors for the delivery of SRE as opposed to the barriers. The facilitating factors include the availability of syllabus to provide direction and the content to teachers and some schools having Internet for the teachers to research to help in lesson preparation.

In terms of the barriers, although there are few these can be considered as major barriers. First, all teachers felt ill-equipped to teach the subject due to a lack of pre-service and in-service training. Second, there is a lack of resources in schools and teachers feared negative reactions from parents when teaching sensitive topics. Third, teachers did not feel motivated to teach the subject as it is not examinable. One female teacher mentioned that:

> In terms of the improvement in sex education, I think more resources are needed. For example, currently, we are just relying on one textbook for all the levels. If there are some charts, pamphlets and educational videos provided by the ministry that would be helpful. [iTaukei female teacher]

Fourth, most teachers do not consider themselves knowledgeable enough to teach and thus spent a great deal of time and energy researching what and how to teach in a comfortable and effective manner. This was mostly articulated by teachers of commerce background.

One male teacher shared that:

> Being a Commerce teacher, I have to prepare well to be able to teach well and maintain student's attention during the class. I have to do a lot of research and search for videos to make my presentation lively to get students attracted to my teaching. [Indo-Fijian male teacher]

Although the syllabus is available, teachers are required to use the Internet and other references to gather materials to teach, and few teachers had access to the free Internet at their schools. Finally, there is also a lack of other media such as multi-media for teaching purposes.

Discussion

The purpose of this qualitative study was to explore the perceptions of SRE teachers regarding the delivery of SRE to students in mainstream public secondary schools in Fiji and suggest solutions and strategies for improvement. This section presents an interpretation of the findings of this study.

Current status of HIV and SRE in selected secondary schools

This study showed that currently, the implementation of SRE is not mandatory in mainstream public secondary schools in Fiji. It suffers a rather vague implementation in schools that attempt to do so. This is really a surprising finding considering that SRE was introduced back in 1985 to address sexual health problems amongst adolescents, including teenage pregnancy and STIs (Kondo, 1985). Yet over three decades later, and despite the efforts to resurrect SRE in 2007–2008 (UNICEF, 2013), the implementation of the SRE has been haphazard and lacks clear guidance and strategic discussion. For example, there has been no teacher training in place to prepare teachers with the skills, knowledge, and hands-on strategies for SRE delivery. Teachers in this study often feel uncomfortable, unsafe, and apprehensive when they were assigned to teach and are consistent with other studies (Buston, 2002; Mkumbo, 2012). Other key issues related to SRE are associated with gender-responsive sexual health education. For example, teachers prefer separate sessions for males and females when discussing topics on sexuality and SRH, and It is an aspect of this study not sighted in any previous studies.

The lack of robust implementation of SRE can be attributed to various challenges and these challenges are interlinked, as discussed below.

First, there is an absence of a comprehensive year or level-specific guidebooks and schemes of work for teachers. There is currently only one guidebook for SRE for levels Year 9-Y13. Although teachers have a syllabus from MoE, teachers did not have a SoW which detailed what (concept) they planned to discuss and when. The guidebook is developed at the national level by a team consisting of education advisors and with inputs from experienced SRE teachers and is sent to schools by the MoE. On the other hand, the development of SoW is the responsibility of the SRE teacher. A generalized guidebook and no thorough SoW could be the reason for haphazard implementation. Lack of year/level–specific guidebooks leaves teachers to make their own individual judgment on what to teach. A year/level-specific guidebook would go a long way in helping teachers make thorough lesson plans including additional recommended reference books and access to the Internet for the teachers for lesson preparation.

Second, teachers lack professional qualifications and training in the delivery of SRE. There is no pre-service or in-service (on the job training) such as a workshop or a refresher course on the subject for the teachers. In Fiji, there is no professional qualification (available) for a teacher to teach SRE, therefore any teacher can be appointed by the school administrator to teach the subject and in most cases, teachers are not at liberty to refuse to teach and so they are compelled to do so. The development of SoW mentioned earlier is the responsibility of teachers. However, in the absence of relevant training, teachers find it challenging to develop a thorough SoW and would rather just pick and teach what they like because they are not qualified to teach what they do or they do not have the right skill set for the job.

The teacher training institutions in Fiji do not provide any pre-service training for SRE and this might be because they do not see it as a lucrative course to offer or MoE may not be advocating enough with the universities for it to be offered.

Acknowledging that there is no pre-service training, the MoE has also not placed adequate emphasis on in-service training such as convening a workshop or refresher training on the

subject that would bring together the experienced and new teachers for sharing knowledge and practices.

Studies have shown that in-service teacher training can greatly help teachers, for example, an evaluation of a six-day teacher training for an AIDS prevention programme as part of school-based sexuality education showed that at the end of the training, teachers reported increased confidence and comfort in teaching the sexuality curriculum (Ahmed *et al.*, 2006; Burns and Hendriks, 2018).

Apart from the training, it is also important that teachers have the content knowledge to comfortably and confidently deliver SRE. However, if they are lacking in content knowledge then it is futile to help them deliver what they do not know. For instance, the same study also showed that despite attending the training, many teachers struggled with the transfer of sexual reproductive knowledge and facilitative teaching methods into the classroom context. In the Fijian context, the study showed that teachers of commerce background had greater difficulty in teaching concepts due to lack of content knowledge. This has implications for the current study. A study in Tanzania showed that teachers supported teaching sexuality education in schools and inclusion of a wide range of topics in the SRE curriculum showing that they have a positive attitude toward delivery SRE, however, the study suggested that there was a need to facilitating teachers with knowledge, skills and confidence to teach various sexuality education topics (Kasonde, 2013; Mkumbo, 2012; Westwood and Mullan, 2007).

Third this study has shown an absence of monitoring and evaluation concerning the delivery of sex education while other academic subjects were closely monitored internally (by the school) and externally by the educational ministry.

The purpose of the inspection, apart from the syllabus coverage, is to look for evidence that teachers are in turn monitoring student's notes and students' notebooks are signed off by the teachers. Clearly, this is lacking when it comes to SRE and this might be because the subject is not examinable, and teachers may not see that as important this not giving equal importance to the subject like any other academic subject. A review of studies on implementing the national CSE curriculum in low and middle-income countries showed that one of the key challenges is inadequate systems for monitoring and evaluating teachers and students on CSE (Keogh *et al.*, 2018). A study on teachers' attitudes toward physical education (PE) showed that teachers needed a conducive, teaching and learning environment as well as resources for effective teaching of PE in educational institutions and that PE should be made an examinable subject in Kenyan secondary schools. This will facilitate compliance with statutory requirements and promote the status of PE in Kenyan schools (Gitonga and Bailasha, 2012). Drawings from this study, the same could be done in Fiji to promote the status of SRE. Additionally, Fiji could potentially consider making SRE mandatory part of the National Curriculum like most countries of Europe and the United Kingdom although the state of implementation various between the countries (Ketting and Ivanova, 2018).

Finally, there are conflicting religious ideologies amongst teachers which hinders the effective delivery of sex education. Teachers picked topics that they judged were important and not what needed to be taught. Some teachers avoided teaching concepts such as contraception because it was against their religious beliefs (Das, 2014; Ghule *et al.*, 2015). This can be linked to a previous challenge, which is that they are not being trained and training may influence what is required to be delivered.

Apart from the challenges mentioned above, this study also showed that there was a consistent emphasis from the teacher of both genders to have sex education in single-sex classes, particularly on the topics that dealt with conception, contraception and STIs. This is because these topics referred to the anatomy of the male and female reproductive organs and opposite genders find it uncomfortable to either teach or ask questions. Further, any

discussion related to sex is taboo in both iTaukei and Indo-Fijian culture, and this might be another reason why the discussion around this topic is not found comfortable by the teachers (Naz, 2014).

Support from the Ministry of Education

The study showed that teachers desired a much greater level of support for the delivery of sex education from the MoE as well as MoHMS as key stakeholders. There is a number of support required. First, teachers currently have had a single guide to assist them in lesson preparation and it is considered inadequate. Second, teachers need formal training to deliver the subject. In terms of the training, an earlier study by the United Nations Educational, Scientific and Cultural Organization (UNESCO) mentioned that the Fiji MoE had planned to have the FLE programme at the Fiji National University (FNU) and integrate it into teacher training; however, this has yet to materialize (UNESCO, 2015a).

Lack of training of teachers in the subject compels the teachers to invest in a great deal of time preparing for the lesson by reviewing and familiarizing themselves with the content. To top that off, some teachers do not know what concepts or the level of detail that needs to be taught to students of a particular level. Teachers felt nervous, shy and uncomfortable many times (Wangige, 2012).

Third, teachers do not have the liberty to invite guest speakers on specific topics, such as a medical or health professional to speak on subjects such as contraceptive use. Guest speakers have been invited in to teach HIV/AIDS, but there is limited literature that evaluates the usefulness of such guest speakers. Finally, teachers found delivering certain topics very challenging. Alldred (2003) showed that in terms of delivering SRE, teachers report considerable anxieties about SRE as a subject and its low status in the school curriculum, committed though many of them are to teaching it (Alldred *et al.*, 2003; Wangige, 2012). This study showed that teachers did not have a choice and felt that they were pressured to contribute to sex education since they did not have any training on pedagogy for the delivery of sex education. Teachers felt they were not doing justice to the children and they felt their teaching was ineffective. As teachers are not comfortable with sensitive topics, they pick and teach what they find comfortable.

This study reinforces other studies that teacher capacity building to deliver sex education is important, as the effectiveness of these programmes is dependent on the professional development of those responsible for SRE implementation (Westwood and Mullan, 2007). The current study can draw from an earlier study focusing on teachers readiness in delivering sex education suggesting that both pre-service and in-service teacher training in sexuality can be a game-changer and points out that such training should seek to not only furnish teachers with theoretical knowledge but also positively shaping their attitudes toward sexuality education so that they do not devalue sexuality education by positing sexuality as taboo, exclusively bio-medical and inappropriate for young people (Wahlström, 2013).

Parental involvement in SRE delivered at schools

Teachers in this study desired partnership with the parents in delivering SREas such partnership would go a long way in reinforcing whatever is taught in the school; however, such a partnership is currently non-existent. It is inferred that some parents would be knowledgeable of sex education being delivered in schools. Although there are studies that encourage parents to talk to their children about sex education at home (Shiferaw *et al.*, 2014; Wilson *et al.*, 2018), this study shows that a teacher-parents partnership approach would be better in Fijian context.

Age-appropriate SRE

There was a consensus amongst all study participants for SRE to commence early, both at home and in schools. This was because teachers acknowledge an increase in teenage pregnancy, as well as rape, and it was felt that early education was needed to reduce the vulnerability of children, particularly females as discussed above. A review of reviews of SRE education has shown that good SRE starts at primary schools (Pound *et al.*, 2017).

Barriers and facilitators for the delivery of SRE

Overall, the study described more barriers in the delivery of SRE than facilitating factors. The key facilitating factor was the availability of guidebooks and syllabus for teaching SRE. The barriers in the delivery of SRE education include the subject not being compulsory; discomfort in delivery SRE education due to lack of training of teachers; lack of resources, fear of negative reaction from parents and the subject is not examinable. These barriers are similar to those that are found in other low and middle-income countries (Keogh *et al.*, 2018).

Strengths and limitations

This qualitative study regarding the perception of the teachers concerning SRE is a first in Fiji and it presents new arguments for SRE advocacy. The study reports findings from primary data-as such the research data includes the views of teachers involved in delivering sex education in mainstream secondary schools. This study can serve as a baseline to assess changes in teacher's perceptions toward SRE over time or when implementation is mandatory. The study was limited in not including the views of personnel from educational ministry or civil society organization. An ideal direction for further studies would be knowledge, attitude and practices of SRE teachers which will potentially help strengthen teachers' own knowledge, shape attitude positively and improved practices while delivering SRE.

Some key recommendations

Key recommendations suggested include in-service teacher training (on the job training) as well as pre-service training for future teachers. The relevant authorities such as health and education ministries should encourage support group formation or such group creation can be led by teachers. Members of support groups can work together to develop instruments such as the SoW and help each other on how best to approach/ teach various topics. Educationists within the group can also share SRE related materials appropriate for teaching and learning. The ministry should consult these teachers and how they can support it. Online learning platforms may be useful for further upskilling the teachers.

Conclusion

The study shows that currently, sex education is neither mandatory nor comprehensive. Implementation has been affected by a lack of support from the ministry, lack of training for teachers and resources constraint among others. Rigorous efforts are needed in order to offer compulsory and truly CSE programme to improve adolescence SRH outcomes in Fiji.

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Corresponding author
Masoud Mohammadenzhad can be contacted at: masraqo@hotmail.com

Community-based occupational health promotion programme: an initiative project for Indonesian agricultural farmers

Tantut Susanto
Department of Community, Family and Geriatric Nursing, Universitas Jember, Jember, Indonesia
Iis Rahmawati
Department of Maternity Nursing, Universitas Jember, Jember, Indonesia, and
Wantiyah
Department of Adults Nursing, Universitas Jember, Jember, Indonesia

Received 20 December 2018
Revised 2 September 2019
31 January 2020
Accepted 6 March 2020

Abstract

Purpose – Occupational health promotion programmes targeting the Indonesian agricultural farmers (AFs) are limited. This action research aimed to involve the AFs in the research and development of community-based occupational health promotion (COHP) programme, which is tailored to meet their perceived needs for preventing health problems related to occupational workplace.

Design/methodology/approach – This study employed the qualitative action research approach. The participants (n = 136) were farmers from seven regions in the rural areas of East Java, Indonesia. The COHP was examined from public health centres (PHCs) in seven regions through eight steps, including recognition, analyses, planning, communication, preparation, implementation, evaluation and continuity of programme, for eight weeks. Data were collected through focus group interviews and examined using qualitative content analysis.

Findings – The findings revealed that the participants not only lacked health status but were also required to promote a comprehensive programme for occupational health and safety. The health problems of AFs were identified as the lack of nutrition and high blood pressure, which are related to un-ergonomic condition during work, limited use of personal protective equipment, high stress and workload. The lack of support for AF groups to prevent health problems and to access health services was a key theme for all the participants. Therefore, self-help group as social support was designed to solve the health problems among AFs.

Originality/value – The COHP, through action research, provided a change strategy for AFs to manage and promote occupational health and safety within their practice. The study findings could be used in the development of a framework for PHCs in delivering occupational health and safety practices in the agricultural sectors.

Keywords Occupational health, Agricultural farmers, Public health centre, Focus group, Action research

Paper type Research paper

The author(s) would like to thank the grant is provided by the Minishtry of Research, Technology, and Higher Education (Kementerian Riset, Teknologi, dan Pendidikan Tinggi/KEMENRISTEK-DIKTI), School of Nursing, University of Jember, and Lembaga Pengabdian Masyarakat (LPM) University of Jember.

Conflicts of interests statement: The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding: The author(s) received financial support for the research from Ministry of Research, Technology, and Higher Education (Kementerian Riset, Teknologi, dan Pendidikan Tinggi/KEMENRISTEK-DIKTI) with No. 2855/UN25/KP/2015 as at the expense of Kuliah Kerja Nyata Program Pemberdayaan Masyarakat (KKN-PPM) through Lembaga Pengabdian Masyarakat (LPM) University of Jember.

Health Education
Vol. 120 No. 1, 2020
pp. 73-85

0965-4283
DOI 10.1108/HE-12-2018-0065

Background

Indonesia's economic performance in 2011–2015 showed an increasing pattern, particularly the agricultural sector which exhibited a positive growth of 3.31% per year. In 2015, the contribution of agricultural sector to the total gross domestic products of Indonesia was 10.28% (Ministry of Agriculure Center for Agricultural Data and Information System, 2016). The majority of Indonesia's labour force work is found in informal sectors in rural areas, particularly in the agricultural sector (Susanto *et al.*, 2017). In addition, agricultural farmers (AFs) face a high risk of health problems, which is caused by the interaction between the farmers and their work environment (Susanto *et al.*, 2016). As the population of agricultural sectors plays a key role in Indonesia's economic performance, the AFs need treatment to maintain health and overcome lifestyle-related health problems (Smigielski *et al.*, 2013). Public health nurses (PHNs) have the responsibility to conduct health promotion, disease prevention and control, wellness and workplace health risk programmes (Anderson and McFarlane, 2011). Therefore, PHNs could design community-based occupational health promotion (COHP) programmes at the worksite. They are excellent resource persons for establishing community partnership to promote the quality of life of AFs through their public health centres (PHCs).

The Indonesian Ministry of Health implements a programme in PHCs to empower labour in informal sectors through preventive and promotive intervention (Ministry of Health Indonesia, 2008), which is known as post-occupational health services to protect the labourers' healthy life problems caused by factors in the workplace environment (Ministry of Health Indonesia, 2006). However, during the implementation, the programme features a limitation in conducting a partnership intervention in the community, particularly the partnership between the PHNs, the AFs groups, community health volunteers and the agriculture department, resulting in health problems among AFs.

The prevalence of various health problems among AFs in Indonesia, which include underweight (28.5%), overweight (10.6%), anaemia (62.6%) and joint and bone pain (50.3%) conditions (Susanto *et al.*, 2017), is related to the sociodemographic environment, biological and psychological conditions and workload. Meanwhile, an agricultural nursing model could be developed to reduce the factors affecting farmers in rural areas (Susanto *et al.*, 2016). In this study, we designed a modified programme for AFs, known as the COHP programme, through action research approach.

According to a systematic review, COHP could improve the quality of community life and engagement with communities in an ongoing process of social change (Merzel and Afflitti, 2003). Active participation in the community development and mental health promotion process enhances health and empowers the community (Trentham *et al.*, 2007). Meanwhile, community-based programming promotes childhood health with collaboration between occupational therapy and community partners (Kugel *et al.*, 2017). Therefore, the COPH programme in this study should be implemented for AFs.

The COHP programme is designed based on health promotion in the workplace and typically falls within three basic programme types: awareness programmes which increase the employees' level of knowledge and interest, behavioural change activities that help participants develop healthier behaviours and supportive environments that create work opportunities to encourage healthy lifestyles (Anderson and McFarlane, 2011). Through action research, the COHP was implemented between the PHNs and AFs in the PHC areas (Vanderwal *et al.*, 2011). The COHP was examined from seven regions of PHCs through eight steps: recognition, analyses, planning, communication, preparation, implementation, evaluation and continuity to promote the occupational health promotion programme (Ministry of Health Indonesia, 2012). The AFs recognise the need to improve their knowledge, attitudes and skills related to maintain health and overcome life-related health problems in the agricultural sectors. The healthy life of AFs was determined by the work environment,

which impacts their quality of life (Kowalska *et al.*, 2013). On the other hand, the AFs have limited access to health services and community-based prevention and promotion services as a strategy to achieve the equality of care in this population (Low *et al.*, 2015).

Furthermore, PHNs should work together with AFs to promote a healthy life and environment for the AF populations. To our knowledge, no study focused on the COHP among AFs by employing action research approach. Thus, this study aimed to explore how AFs can be engaged to create a promotion programme (COHP) to identify and reduce health problems and their impacts on agricultural sectors through eight steps: recognition, analyses, planning, communication, preparation, implementation, evaluation and continuity. In this study, we sought to help AFs articulate and critically reflect on their experiences, meaning and values around the issue of health problems in occupational workplace. Therefore, they could use their learning in each step of COHP to guide the development of prevention strategies in their own workplace.

Methods

Design and sample

This study employed a qualitative participatory action research approach. This work also used focus group interviews and involved AFs in the research and development of COHP programme, which was tailored to meet their perceived needs for preventing health problems related to occupational workplace, for eight weeks. This method was designed to facilitate the emergent processes of collaboration and dialogue that can motivate, increase self-esteem and generate community solidarity (Polit and Beck, 2010). We selected action research as a method of inquiry because it offers a dynamic process for joint learning and problem solving. Action research as a form of inquiry is comparable to the participants' experience of the nursing process, which is a systematic sequence of assessment, planning, implementation and evaluation (Wepa, 2003). The experiences, meaning and values around the issue of health problems, which were determined by strategic selection, were explored through eight steps: recognition, analyses, planning, communication, preparation, implementation, evaluation and continuity during the COHP.

We contacted the managers (PHNs) of PHCs with high proportions of the AFs in seven regions in East Java, Indonesia. All managers permitted the researchers to conduct the study in their areas. Then, the PHC managers invited the AFs through flyers, which were distributed to seven regions, to participate in this study. In total, 136 AFs agreed to participate in this study. From the 136 AFs who participated in this study, 11–25 AFs were from the seven regions described in Table 1. Participants were recruited for four focus group interviews in each region with three to six individuals per group. Participants and their managers received oral and written information concerning the study. Participation was voluntary. This study was approved by the Ethical Committee of Research Center Department in Indonesia.

Measures

This study was conducted through eight steps for eight weeks. The duration of programme activities differed depending on the AFs before moving on to the next activities. Figure 1 illustrates the conceptualisation of the programme. The programme activities were used based on the guidelines of health promotion programme in occupational workplace (Ministry of Health Indonesia, 2012).

The participants and the researchers collaborated to follow each step. In each step, we conducted a farmer group meeting (FGM) in the PHCs. In the meeting, we invited 136 AFs for the focus group discussion. In this meeting, we discussed with the participants how to explore

Characteristic of participant	Region A	Region B	Region C	Region D	Region E	Region F	Region G
Number of participant (*n*)	16 (11.8)	11 (8.1)	26 (19.1)	14 (10.3)	20 (14.7)	24 (17.6)	25 (18.4)
Age							
Median (years)	48	50	48	50	52	48	50
Gender (n / %)							
Male	11 (68.8)	8 (72.7)	20 (76.9)	9 (64.3)	18 (90.0)	20 (83.3)	19 (76.0)
Female	5 (31.2)	3 (27.3)	6 (23.1)	5 (35.7)	2 (10.0)	4 (16.7)	6 (24.0)
Length of works							
Median (years)	8	11	9	12	11	10	8
Education level (n / %)							
Elementary school	7 (43.7)	4 (36.4)	8 (30.8)	5 (35.7)	4 (20.0)	3 (12.5)	8 (32.0)
Junior high school	7 (43.7)	6 (54.5)	10 (38.4)	5 (35.7)	9 (45.0)	12 (50.0)	6 (24.0)
Senior high school	2 (12.6)	1 (9.1)	8 (30.8)	4 (28.6)	7 (35.0)	9 (37.5)	11 (44.0)

Table 1. Characteristic of participants that attended COPH programme ($n = 136$)

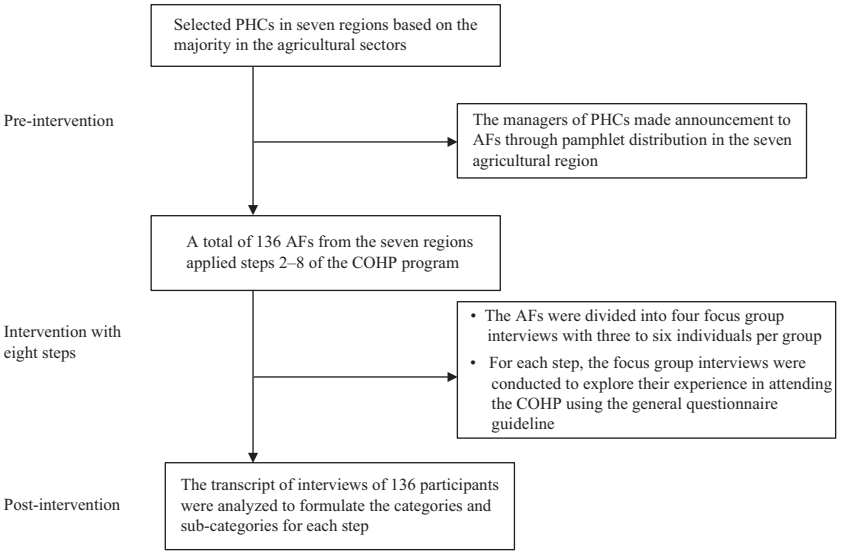

Figure 1. Conceptualised COHP program including steps one to step eight

their experience, meaning and values during the steps. The authors led the discussion processed in this study. Table 2 illustrates the programme activities of this study. The discussion guide for the investigation of the AFs during the COHP programme was based on the following questions: What are your health and life-related health problems in agricultural sectors? What do you do to solve such problems? What are your barriers or limitations to achieve a healthy life in agricultural sectors? What is your experience during follow-up of the COPH programme? What is your need or expectation based on your experience to continue the programme? The meeting lasted from 60 min to 90 min.

Steps	Activity	Weeks	Description
Step 1	Recognition	1	This activity was conducted to identify the health status, health conditions, overview of the disease and work behaviour of farmers
Step 2	Analyses	1	This activity aimed to determine the relationship between the risk factors of knowledge and behaviour of farmers to formulate a structured intervention for corrective actions regarding their health, the magnitude of their health problems, the amount of losses incurred by farmers owing to their health problems and the funds available for farmer groups
Step 3	Planning	2	These planning activities were carried out to set together with the representatives of farmers and FGM their targets, to develop a process for achieving the targets and to establish the indicators of success of farmer group activities
Step 4	Communication	3	Plans have been drawn up to communicate with the management of farmer groups and farmers involved in FGM and to support high-level management of farmer groups to achieve the goals set.
Step 5	Preparation	3	Prior to the program, the farmer groups performed several steps to prepare for the smooth implementation of COHP. These steps included the following: supporting the management in writing to farmer groups and individual farmers, establishing farmer groups along with the description of their duties and responsibilities, coordinating the relevant components, developing a plan of action, preparing materials, facilities and infrastructure COHP and setting up a reporting format and documentation
Step 6	Implementation	4–7	COHP was implemented through the combination of various means of health education, training and work in a healthy behavioural intervention, individual or group sessions (counselling, discussions, simulations and games), consultation/facilitation of farmer groups, practice of healthy behaviours (performing physical activity in agriculture, consumption of healthy food, the use of personal protective equipment and stretching) and assuming an ergonomic position for when at the farm
Step 7	Evaluation	8	This activity aimed to identify the predetermined objectives of COHP to successfully fund and support the programme and effectively and efficiently set the pace/next short-term and long-term phases of the program
Step 8	Continuity	8	The COHP program was continually developed based on the needs of AFs, and the unsuccessful programmes were re-analysed for existing problems and improved

Table 2.
Description of steps on COPH programme

Analytic strategy

The characteristics of participants were analysed using descriptive statistic. A qualitative content analysis was conducted based on the semantic relationships between the variables, particularly the association of each meaning and the significance of each phenomenon experienced by the participants (Streubert and Carpenter, 2011). The recordings from the interviews were transcribed verbatim, but the sentence construction and grammar were subsequently modified to improve readability. Three authors were involved in analysing the interviews to achieve a common understanding and reinforce the level trust and credibility (Graneheim and Lundman, 2004).

Textual descriptions used in the qualitative study included the use of categories listed by each participant, transcripts of the interview, the use of the results which vary from each participant, a narrative or story and establishing the keywords found by the interpretation of the researchers and participants (Wood and Hendricks, 2017). After the transcribed manuscripts were read several times, they were then sorted into units of meanings. The

scripts were then sorted into the units followed by a deep-sense abstraction and encoding. Various codes were then investigated into the same or different meanings and then organised into categories and sub-categories. The categories identified in this study reflect the contents of the study and the categories that have been identified from each stage of the COHP programme. The validity of research data is based on the principle of credibility, transferability, dependability and confirmability (Streubert and Carpenter, 2011) of the AFs that were involved in the eight steps of the COHP programme.

Results

The results from focus discussion in seven regions were analysed and divided into categories and sub-categories. The analyses were performed based on the eight steps of COHP programme in this study. Each step generated categories and sub-categories related to the AFs' experiences in following the COHP programme (Table 3).

At each stage in the programme implementation activities, which were facilitated by the research team as leaders in FGM, the AFs independently identified their health problems. Each phase in this programme occurs in a series, where farmers begin to identify health problems. Then, they formulated an action plan to solve the problem, take action together in their groups, and evaluate the activities that have been carried out. Therefore, each phase of this programme is an activity carried out from, by and for farmer groups as a form of partnership in a COHP programme. The success of each activity phase in this programme was assessed from the readiness of each programme activity through a joint meeting forum.

This section presents the categories and quotations from the interviews to illustrate the findings in each step.

Recognition

According to the informants, they understand that they are experiencing health problems caused by the work environment on the farm. Therefore, several diseases that are often experienced by farmers in the agricultural environment occur. The informants realise that the health problems which arise are related to unhealthy behaviour.

> We realised over time and age. . . our sick condition and its severity depending on the problem and the type of work.
>
> . . . that many experienced diseases, such as joint pain or gout, occasionally through pain in the spine, resulting in their poor work performance.
>
> . . . high blood pressure, weakness and occasional exhaustion also occur due to the lack of adequate nutrition.
>
> . . . become sick because of work and the high workload, especially in the case of crop failure, which causes stress. However, if we do not work, we cannot earn money for our family.

Analyses

The analysis of the interviews indicated that the AFs perceived four health problems related to agricultural sectors: low health status, lack of awareness to maintain ergonomic conditions, less use of personal protective equipment and stress and workload. These problems are related to their low knowledge and limited resources to protect the problems.

> We experience health problems, including malnutrition, high blood pressure or pain in the bones and joints, because of daily work that lasts the whole day and occasionally continues until late at night.

Steps of COHP	Categories	Sub-categories
Recognition		
	Understanding to solve health problems in the workplace	
		(1) Awareness of the low health status
		(2) Incidence of diseases related the workplace environment
		(3) Lack of healthy life behaviours
Analyses		
	Low health status of the farmers	
		(1) Inadequate nutrition and irregular mealtimes
		(2) An increase in blood pressure with specific symptoms
		(3) Pain on the bone and joints
		(4) Limited access to healthcare services
	Lack of awareness to maintain ergonomic condition	
		(1) Lack of knowledge to maintain the health position during work
		(2) Imbalance in constant stretching and relaxation during work
	Rare use of personal protective equipment	
		(1) Limited resources for personal protective equipment
		(2) Limited socialisation for discussing the use of personal protective equipment in informal agricultural sectors
		(3) Lack of knowledge on the use of personal protective equipment for pesticides
	Stress and workload of the farmers	
		(1) Imbalance between rest, sleep and workload
		(2) Excessive work days
		(3) Limitation of farmer groups to support member activities
Planning		
	Maintaining the health condition	
		(1) Providing health education to improve the healthy lifestyle for farmers
		(2) Conducting meetings to discuss the use of personal protective equipment
		(3) Setting a programme to address the physical and psychological needs of farmers
	Access to healthcare services	
		(1) Screening programme in primary health centres
		(2) Diagnoses of health diseases related to the occupational workplace
		(3) Treatment of the diseases occurring in the occupational workplace
	Continuity of treatment	
		(1) Rehabilitation of farmers suffering from occupational diseases
		(2) Return to work of farmers after rehabilitation
Communication		
	Communication and coordination between the programme and the department	
		(1) The cooperation between occupational health programme and the others programme in PHCs related to agricultural sectors
		(2) Inter-sectoral coordination between the health department and agriculture department to maintain farmer group activities
Preparation		
	Organising the occupational health programme	
		(1) Developing a comprehensive management system for the programme
		(2) Preparation of material, equipment and infrastructure of the programme
		(3) Preparation of the format of reporting and documentation of the programme
Implementation		
	Activities to support and reduce health problems in the agricultural workplace	

(*continued*)

Table 3.
Main categories based on the eight steps of COHP programme

Steps of COHP	Categories	Sub-categories
		(1) Providing health education to farmers with topics focussing on nutrition, ergonomic condition, the use of personal protective equipment, sleep, rest and management of stress workload
		(2) Formation of health occupational post among farmer groups
		(3) Teaching and recruitment of health volunteers in informal agricultural sectors
		(4) Consultation about health problems among agricultural farmers
Evaluation		
	Analysis of the progress of occupational health promotion	
		(1) Identifying the achievement of occupational health services goals
		(2) Assessment of programme benefits for the farmers
Continuity		
	Maintaining the continuity of COHP programme	
		(1) Programme development based on community needs
		(2) Re-analyses of health problems and implementation of new activities to solve such problems

Table 3.

> We need to use special work clothes, but we lack the money for purchasing shoes, gloves, gowns, goggles and protective headgear.
>
> We cannot conduct meetings to discuss the use of personal protective equipment in our work in clinics given the time of fertilisation and spraying of pesticides. Meanwhile, our traditional farmers have limited funds for the procurement of these tools.
>
> When working in the fields. . . the tools used, such as manual hoe, are simple and traditional. From time to time, we carry the harvest in our head, bending our shoulder or back. . . thus, we occasionally experience spinal pain.
>
> We start working in the fields before sunrise, continue until breakfast, take a brief lunch break in a paddy hut and then continue working until the afternoon. We perform the same routine every day.
>
> When we arrive at home, we must prepare for our activities for the next day, including feeding the cattle and cleaning the stables. As a result, we sleep late but wake up early for work. . .
>
> A group of farmers is present in each area, but they rarely solve health problems. Instead, they focus on agricultural issues. Thus, developments in the field of health are needed.

Planning

The informants began planning to address the health problems identified in the analysis. The farmers wanted to achieve health education and prevention of health problems, address the need for periodic inspection of health centres on their health status and provide ongoing services which should be referred to a hospital or nursing home.

> Health education and training activities regarding the healthy lifestyle of farmers are needed in health centres to avoid the diseases caused by agricultural farming.
>
> Periodic socialisation and assistance on personal protective equipment and healthy lifestyle are needed by farmers working in the fields.
>
> PHCs, through village health posts, should provide periodic inspections to detect health problems among farmers and seek for their treatment and referral to hospitals if necessary.

> Several farmers who suffer from accidents while working require a long treatment period. Thus, they contemplate about how soon they can complete their rehabilitation in order for them to return to work.

Communication

Health promotion programmes for farmers, according to the informants before the programme was implemented, should involve communication with the various parties in the community. Cooperation and coordination between departments and between programmes in the clinic need to be developed.

> In numerous health centres implementing a health care plan, the programme for solving health problems of farmers should be coordinated.

> PHCs can cooperate and coordinate with the Department of Agriculture in developing farmers' health posts in every area. Thus, primary care health could be equitable and sustainable for farmers.

Preparation

According to the informants, farmers need well-planned and thorough preparation in implementing health promotion programmes.

> I felt that a number of programmes were implemented, but they could not be sustained due to the lack of a mature management system.

> Resources and infrastructure in the management of funds and programmes should be prepared, and how the programme system is reported in health centres must be regulated.

Implementation

The informants felt that in implementing the COHP programme, several activities need to be conducted, such as health education involving participation in the intervention group activities, thus indicating the need for empowerment of groups and partnership among farmer groups. In this study, we identified the need for health education of AFs. The topic of health education for the AFs was nutrition, ergonomic situation, the use of personal protective equipment, sleep and rest and management of stress workload. Therefore, in the agricultural sectors of rural areas, the AFs are supported with post-health occupational programme among farmer groups. These groups are facilitated by health volunteers in informal agricultural sectors who teach and offer consultation for health problems among the AFs.

> Socialisation and health education at the village or community level will help farmers in the prevention of occupational diseases that can be acquired in farms.

> Event group processes, such as social support groups or self-help groups, need to be established between farmers to help them overcome the problems among their groups.

> Farming communities need to be empowered as a training cadre to recruit agricultural health volunteers who can help farmers.

> A partnership must be established between clinics, the Department of Agriculture and farming communities in terms of various targeted, efficient and effective health activities.

Evaluation

According to the informants, health promotion programmes that have been implemented should be evaluated in terms of the achievement of the work programme and benefits for farmers. Through programme evaluation, farmers evaluate health promotion activities through self-awareness and self-acceptance related to health problems related to the work

environment of farmers. In addition, satisfaction with programme implementation is evaluated through group meeting activities.

After attending the programme, the AFs maintained their health related to agricultural environment. They managed their nutrition to maintain their body mass index. During their work, the AFs maintained ergonomic position and used personal protective equipment to prevent injury. Then, after working for a long day, the AFs attempted to balance their sleep and rest and manage their stress workload.

> After following this COHP programme, I experienced a number of benefits although the programme implemented was short. These programme resulted in impacts that improved the farmers' knowledge and understanding of healthy living in the interests of the farming community.

> We could maintain our health based on agricultural activities for farmers, including how to acquire adequate amounts of nutrition, how I must work with the right condition and the use of specific equipment to protect ourselves.

> We attempt to sleep right after working for a long day and reduce our stress before sleeping. If we become exhausted while working in the farm, we also take a rest or a nap.

Continuity

The COHP programme which has been running for eight weeks, according to the informants, must be followed up and developed to address the public health problems of farmers.

> I feel that such a programme must be continually developed, because the farmer community becomes actively involved in projects ranging from excavation problems, plan development and solving problems together with other groups of farmers. Thus, this programme is of, by and for the farmers themselves.

Discussions

In the present study, the occupational health promotion programme aided AFs in the rural areas. The findings indicate that the COPH programme was used to assess the health problems, formulate the occupational health diseases related to the workplace, plan interventions and implement activities and was evaluated by the farmers. This programme used the resources from farmer groups to conduct self-assessment and further develop the programme. The COPH is effective and efficient in solving the health problems related to the agricultural workplace and environment. This result is consistent with the findings of a previous study in the context of health promotion programme for farmers and fishermen with type-2 diabetes in Taiwan (Chen *et al.*, 2011).

In this study, the participants were encouraged to recognise the health problems related to agricultural workplace. The informants were aware that health problems were onset because of the lack of knowledge and limited resources. The farmers identified the problems through self-assessment and analysed them. These findings are consistent with those of previous studies indicating that farmers are self-confident and have self-efficacy to improve their health (Syson-Nibbs *et al.*, 2009). These results indicated that the AFs need a supporting system to identify their health problems through self-reflection in their workplace environment. Self-help group could be designed as a primary strategy to identify health and life problems related to the agricultural workplace and environment.

Participants perceived that the common health problems in agricultural sectors include malnutrition, high blood pressure and low back pain. This finding is consistent with that of previous studies in the context of agriculture in Indonesia (Susanto *et al.*, 2017). These findings may explain the relation of the AFs' health problems to the knowledge on the management of stress and workload, maintenance of ergonomic position, the use of personal protective equipment and limited nutritional intake. These findings are consistent with those

of a previous study suggesting that problems in the workplace are related to stress in workplace (Das, 2014), ergonomic position (Padmanathan *et al.*, 2016) and safety in workplace (Vanderwal *et al.*, 2011). This finding suggests that health education related to diseases in the agricultural sectors should be disseminated among the farmers.

The activities of COPH programme in this study have improved the AFs' self-care to manage their health problems through promotive, preventive and protection activities. These findings are consistent with those of previous studies in the context of the community health promotion project for garlic farmers, which are effective and can be recommended as a nursing intervention for health promotion of garlic farmers (Kim and Ock, 2011). The AFs are involved in the empowerment and partnership programme to maintain the sustainability of the programme. Community-based education could promote the health status of country market farmers (Jones and Siegrist, 1999). This result suggests that health promotion programme should be implemented in the community of farmers to improve their quality of life.

Furthermore, the implementation of COHP requires coordination and cooperation to ensure its continuity. This finding is consistent with that of a previous study indicating that assisting with farm tasks as a method of health promotion effectively sustains the programme (Aizaki *et al.*, 2016). The AFs need to communicate their problems through inter-sector and inter-programme between the agriculture department and primary healthcare centres in their areas. These findings indicate that post-healthcare services should be established to serve healthcare in agricultural areas.

Implication for practices

The COPH programme can increase the awareness and participation of farmers in health promotion programmes. Therefore, this model can be developed in increasing participation and community empowerment in occupational safety and health programmes in agriculture. Health education related to farmer health and the environment of agricultural work can provide the knowledge, attitudes and life skills in farmer occupational health. Meanwhile, providing support through monitoring and evaluating activities in the community needs to be achieved continuously and sustainably for PHCs to improve the quality of life AFs (Susanto and Widayati, 2018).

Limitation

This study features certain limitations. Firstly, the action research approach impedes the foregrounding of participants' experience and their full participation. Therefore, a mixed method approach should be used for the future research to identify the prevalence of health problems and the experience of farmers during the health promotion programme to solve their problems. Secondly, this study was conducted in rural agricultural sectors in which the participants are known as informal workers. Thus, the findings could not be generalised or applied to others formal workplace environments. The structure of the steps of the COPH programme in this study presents a potential threat. Therefore, the future research should be mixed with theoretical framework models of health promotion to guide to the next project.

Conclusion

The findings indicate that the COHP through action research provides a change strategy for AFs to manage and promote of occupational health and safety within their practice. The AFs assessed their health problems and become aware of their occupational health issues, including malnutrition, high blood pressure, low back pain, non-ergonomic condition, stress and workload. Therefore, in the implementation of the COPH programme, the AFs are involved in community activities, including health education, groups processes, empowerment and partnership to access comprehensive healthcare services in PHCs. These findings could be used to develop a framework for PHCs in delivering occupational health and safety practices in the

agricultural sectors. We suggest that further studies should focus on the continuing structural steps used to blend a framework model on health promotional programme with mixed method approach to solve the agricultural health problems.

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Corresponding author
Tantut Susanto can be contacted at: tantut_s.psik@unej.ac.id

Food and cultural norms: rural mothers' selection of nutrition intake for their young children

Fozia Ahmed Baloch, Nazir Ahmed Jogezai and Shaik Abul Malik Mohamad Ismail
School of Educational Studies, Universiti Sains Malaysia, George Town, Malaysia

Received 23 September 2019
Revised 5 December 2019
Accepted 6 March 2020

Abstract

Purpose – This study aimed at exploring food related cultural norms that influence rural mothers' food selection for their primary school aged children (aged 4–7 years).

Design/methodology/approach – This is a qualitative study conducted in northern parts of Balochistan province of Pakistan. The Theory of Planned Behaviour (TPB) was applied as the theoretical framework of the study. Within a qualitative research method four focused group interviews with 30 rural mothers were employed to generate data.

Findings – The study found that mothers' food selection for their children was heavily influenced by certain cultural norms that have become taboos with the passage of time. It is evident through findings that subjective norms have a greater influence on mothers' behaviour than their attitude and perceived behavioural control (PBC).

Originality/value – We ensure originality of this research paper as fewer researches have been conducted to further elaborate the link between socio-cultural norms and food selection. In particular, the influence of this close relationship on child health has been of limited consideration in a developing context. This paper has neither been published elsewhere, nor it is currently under consideration for publication in any other journal.

Keywords Cultural norms, Nutrition, Food selection, Mothers, Behaviour, Qualitative research

Paper type Research paper

1. Introduction

Food and food habits are the basic components of a culture. It, therefore, remains among the oldest and most deeply entrenched aspects of many cultures. As a basic principle of culture, food habits provide a focus of association, a channel of love, discrimination and disapproval and usually have symbolic references (Reddy and Anitha, 2015). The sharing of food symbolizes a high degree of social intimacy and acceptance (Mellor *et al.*, 2010; Nizel, 1969; Stajcic, 2013) and hence communities keep attached to food-related cultural norms and values (He *et al.*, 2005; Green *et al.*, 2003).

Malinowski's (1931) definition of culture includes those aspects which comprise of inherited artefacts, goods, technical processes, ideas, habits and values as well as ways of satisfying basic needs, such as food. Food as a basic human need is highly embodied in a community's social fabric. In the same pattern, the contemporary research (e.g. Cook *et al.*, 2006; Davis *et al.*, 2003; Fisher *et al.*, 2015; Lee, 2015; Lee, 2007; Melgar-Quinonez and Kaiser, 2004; Neuman *et al.*, 2019; Novilla *et al.*, 2006; Reddy and Anitha, 2015; Rosegrant and Cline, 2003; Scaglioni *et al*, 2018) identifies a close association between one's culture and food selection. Lee (2015, p. 2) argues that '. . .eating and our food choices extend well beyond the pedestrian informing more than individual identity, that it is also a cultural

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sector.

Declaration of conflicting interests: The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

0965-4283
DOI 10.1108/HE-09-2019-0040

and social signifier'. Similarly, Pakistan is a multi-cultural society with different cultural identities in terms of food choices; however, foods that are generally common amongst Pakistani societies include pulses, vegetable and meat (Khan *et al.*, 2019) along with rice or roti (bread) as an essential course of meal. People in Pakistan are fond of eating traditional foods, the cultural diversity of spices and other ingredients used in cooking (Nastasi and Schensul, 2005), thus specify the taste accordingly. Food patterns in Pakistan, however, keep changing across the seasons, resulting in dietary diversity as well as calorie intake (Kassam-Khamis *et al.*, 2000).

The current study was conducted in Balochistan, province of Pakistan. Balochistan, like the other provinces of Pakistan, consists of a multicultural and multilingual society divided into three main ethnic groups including Baloch, Brahvi and Pashtoons (Hashmi, 2015). This study was, however, conducted in northern parts of Balochistan, located near the Afghanistan boarder, and the population of the region are Pashto speaking and in the range from middle to lower middle class. Farming remains the key source of income of these communities. Joint family system is a prominent way of living based on family solidarity and welfare. In joint social structure composed with a male dominant feature is led by elder males. Women are solely responsible for home-related chores (Lindsay *et al.*, 2011) while men execute the matters of earning and social interaction amongst the communities. Similarly, these women are solely responsible for food preparation for all the family members including children (Anving and Sellerberg, 2010; Holm *et al.*, 2015).

Hence, food and eating habits are culturally defined behaviours that individuals acquire in order to become a part of that particular society (Mellor *et al.*, 2010). The Theory of Planned Behaviour (TPB) was therefore deemed most appropriate in order to understand mothers' behaviours in a particular context. TPB is a social psychological theory most commonly used to study human behaviour (Ajzen, 1991; Ajzen and Madden, 1986; Ajzen and Timko, 1986). A number of researchers have used TPB to understand a variety of food and diet related behaviours (Branscum *et al.*, 2016; Cook and Frank *et al.*, 2006; Lindsay *et al.*, 2008; Macy *et al.*, 2012; Nerud and Steiner, 2019).

TPB is the theory most researchers use to study human behaviours at all levels (from behavioural intent to the actual behaviour). The theory assumes that attitude, subjective norms and perceived behavioural control influence behaviour through intentions (Chan and Tsang, 2011; Fila and Smith, 2006). However, in this study, direct constructs of intention were not included because the study aims at exploring factors that influence mothers' existing behaviours towards their food selection for their children.

Attitudes according to Fishbein and Ajzen (2010) are a person's positive or negative beliefs about an act or a behaviour that have been formed on the basis of perceived behavioural outcomes, subjective norms are the normative beliefs that represent how much a person is concerned about whether or not to perform the behaviour in a particular social context. Further, perceived behavioural control refers to a person's perception of how easy or difficult the underlying task or behaviour could be in the given circumstances (McDermott *et al.*, 2015; Topa and Moriano, 2010). This study thus considered TPB well appropriate to serve its purpose of exploring cultural norms that influence mothers' behaviours towards selecting food for their children.

2. Method

The purpose of the study guided the researchers to use the Theory of Planned Behaviour as the theoretical framework. Literature reveals that most of the behavioural studies using TPB as a theoretical framework are quantitative and cross-sectional in design (Armitage and Conner, 2001; Esfandiar *et al.*, 2018; Swanson *et al.*, 2011; Topa and Moriano, 2010). TPB is rarely used to conduct formative studies. In fact, there are very few qualitative studies that

have applied TPB to explore food related behaviours (Lindsay *et al.*, 2008; Seo *et al.*, 2011). Researchers, therefore, recommend that qualitative data can provide information needed to understand cultural perspectives (Bisogni *et al.*, 2012). This study, therefore, found it appropriate to use a phenomenological approach to qualitative research. Phenomenology in research is commonly illustrated as the study of a phenomenon through participants' personal experiences and perceptions (Neubauer, Witkop and Varpio, 2019: Tuffour, 2017). Phenomenology, according to Merriam (2002) is an effort to investigate unprobed experiences of participants' daily lives and ascribe meaning out of those experiences in a particular context. The phenomenon of interest in this study was the food related cultural norms that influenced mothers' behaviours towards selecting food for their children. This research method through focus group discussions, thus helped in investigating and understanding of the meaning being ascribed by mothers about their children's daily nutrition intake (Johnson and Christensen, 2004). Qualitative method generally provided insight into mothers' experiences which could not be easily and accurately gathered through other methods (Creswell, 2009; Lichtman, 2006; Sarantakos, 2005).

No doubt, there is large amount of research that has used a TPB questionnaire to predict the behavioural intention. However, the theory still stands unique as the items employed in prior research may not be appropriate for a different behaviour, population or time period (Ajzen, 2013). It is therefore, recommended to form questions suitable for the behaviour under study and population of interest each time TPB is used. To serve the purpose of this study, guiding questions were developed based on TPB constructs of attitude, subjective norms and PBC (perceived behavioural control) as recommended by Ajzen (2006a, 2006b). The data were collected through open ended questions as open ended questioning provides the opportunity to 'dig deeper' with help of probing questions (Oppenheim, 1992).

The sample for the study consisted of 30 mothers (having children aged 4–7 years) as they are directly involved in maintaining nutrition of their children at home (Lindsay *et al.*, 2006). In this study focused group discussion based on Ajzen's (2006a, 2006b) and Francis *et al.* (2004) recommendations, remained the only data collection method. Prior to proceeding with each focused group discussion participants were oriented with the study procedures via sharing a written information sheet through the schoolteachers. The participants were also introduced to the notion of the study which helped the respondents to comprehend the questions to fully contribute. The written consent was earned, and the participants were contacted two days before the group interview enabling them to participate in the focus group.

The interview guide was developed with reviewing the relevant concepts and was shared for review with nutrition experts and, in particular, those having expertise of studying cultures and its impacts on nutrition and overall living. The guide included semi-structured questions structured around the related aspects of mothers' selection of nutrition intake for their children in the cultural context of the community being studied. Interview questions were translated into Pashto being the native language to gather accurate data. Accuracy, however, according to Halai (2007), is hard to achieve, when responses are translated from one language to the other, 'as each language is different' (p. 351). In order to cope with the challenges of translation, researchers did not use word by word translation approach, because few words have their own contextual connotation and cannot be translated as it is. In the context of this study, for example the word 'Landhi' [dry meat] in Pashto language does not have an exact synonym in English language. The word was, therefore, translated into its closest possible meaning in English language, with the original word in brackets, as recommended by Halai (2007).

The demographic information including age and highest level of education was obtained on the day of focused group interviews. Each of the focus group discussion involved seven to eight participants. All responses were recorded in Pashto language and manuscripts were

jotted down simultaneously (Krueger and Casey, 2000). In total, four focus group discussions were held, each for approximately 01:30 min with each group having one focus group per day during school hours. School premises were chosen as the location for data collection for the participants' convenience and ease of access. Focus groups were facilitated by the researchers in person. Data was collected through the semi-structured interview guide containing open-ended questions accompanied with probing questions. All the interview questions and statements were derived from the TPB constructs (i.e. attitudes, subjective norms and PBC).

The interview outline was defined on the basis of the TPB adopted for this study. Three main questions were developed to address each element of the theory (attitudes, subjective norms and PBC). To explore mothers' attitudes in relation to selecting food for their children, they were asked to mention what they considered to be positive and negative outcomes of selecting food for their children. Subjective norms were identified by asking questions about the influence of people and culture (expectations and common practices). Perceived control factors came from questions about perceived ease or difficulties mothers' thought they would face while selecting food for their children.

The data were analysed after the recorded data had been transcribed verbatim. The data were first translated into English and then analysed through inductive analysis (Neuman, 2014). Similar or identical data were removed in the data reduction phase. The transcribed data was coded, and data of similar codes were grouped to generate themes (Creswell, 2013; Marshall and Rossman, 1999). These themes and sub-themes were reviewed several times by the researchers and the nutrition experts who were engaged in reviewing the discussion guide and semi structured interviews.

The data revealed several factors against each element of TPB, having direct or indirect influence on mothers' selection of food for their children. Table 1 below contains examples of participants' responses to the questions, in relation to attitudes, subjective norms and PBC. The first column contains the list of TPB elements (attitude, subjective norms and PBC) followed by a list of general and specific aspects that were explored in focus groups.

In order to look for common data patterns, the researchers decided to avoid using any data analysis software. The idea is also supported by the researchers who think that the use of software for qualitative data analysis makes the researcher distant from data, makes data fragmented, and forces the researcher to make the data homogeneous for computer coding needs (Vidovich, 2003). Thus, this study used simple interpretive data analysis strategy to analyse the qualitative data collected through focus group discussions.

Although the presentation of qualitative data usually encompasses the narrative mode or is perceived as qualitative narrative by Creswell (2009), the process involved a chronology of events, description of themes and quoting the respondents. The approach of mixing both narration and visuals are perceived to be more informative and comprehensive. The presentation of the data was adapted from Creswell (2013) and Thomas (2006). The format of presentation involved reporting the data in narration along with summarizing the themes and sub themes in the table through descriptive presentation. Following the said adapted approach, the data is presented in Table 1 encompassing the precise yet comprehensive explanation of themes, sub themes with evidences of codes along with the frequency and percentages of sub themes. The frequency and percentage are presented to provide additional information that display the intensity of each category or themes that number of participants mostly quoted. Frequency and percentage refer to the number and percentage of participants who pointed out the same category or sub theme. For example, if two out of four respondents reported the similar views generating a theme then it was shown with two in frequency and 50% in the percentage column.

Responses against TPB elements		Frequency	Per cent
Mothers' attitude towards selecting food for their children			
Positive attitude	I think I should select food for my children because I know what my children like to eat	23	77%
	Because I serve, I know what foods my children enjoy eating	22	73%
	As a mother I should know about my child's food choices	24	80%
	Food should be selected according to children's taste so that they will eat better	25	83%
	If I prepare their favourite food, they will eat more	19	63%
	Eating more food is good for my children	17	57%
Negative attitude	It does not make a difference who selects food for my children	6	20%
	After all I am the one who cooks, no matter I select or not	4	13%
	I do not have enough experience regarding food selection	9	30%
	I may not choose the right food	16	53%
	I usually consult my mother or mother-in-law because they know better about food for children	17	57%
	There are certain foods that are not suitable for young children	15	50%
	Children may get sick if we give them the food, they cannot digest	16	53%
Subjective norms related to mothers' selection of food for their children			
Expectations	I am expected to consult elders (mother or mother-in -law) when selecting food for my child	22	73%
	My job is to cook food	26	87%
	My mother-in-law decides what to prepare for child's meal	25	83%
	Elderly women know better what is good for my children and what is not	27	90%
	My grandmother advises what young children should eat	26	87%
	She has learned it through her own experiences	27	90%
	I am not supposed to interfere in these matters [child's food selection]	20	67%
	Any interference in household matters is considered as disrespect to elders	21	70%
	As a good wife and a good daughter-in-law, I must obey what my in-laws say	22	73%
	My mother and other family members also except me to be obedient to in-laws	20	67%
	I am not supposed to argue even if I know what food is better for my children	21	70%
	My mother guides me all the time what food is good for children according to age	24	80%
	My mother and mother-in law prohibit me from selecting food for my child because they think I cannot choose the right food which may harm my child	20	67%
	I am afraid if my child gets sick because of the food I select	25	83%
	My husband will get angry	28	93%
	No one of the young mothers in the community decide food for their children	21	70%
Common practice	Every family that I know have the same custom that elderly women decide what children should eat	21	70%
	They also want cultural foods to be given to children such as dried meat, so they are acquainted with their culture	25	83%
	In every family that I know meat is dried in winter seasons	26	87%

(*continued*)

Table 1. Participants' responses

Responses against TPB elements			Frequency	Per cent
		I know fresh meat has more benefits, but dry meat is our tradition through generations	19	63%
		Those who have Landhi [dried meat] throughout the year are known to be well off families of the community	23	77%
		We rarely drink milk	20	67%
		Milk are heavy for children; we do no't prefer for them	19	63%
		Children hardly drink a glass of milk in a year, they take milk when get sick and doctor advises to drink	20	67%
		Milk butter is better in summer but in winter it produces sore throats	23	77%
		Butter is only good in breakfast	22	73%
		Apple is always gastric, and eggs cause constipation to children	21	70%
Perceived behavioural control				
Perceived ease		We have locally available foods such as vegetables, fruits and nuts	25	83%
		Foods that are produced at home including milk, butter, yogurt, eggs are easily available	24	80%
		Children like eating potatoes	25	83%
		My children usually eat potatoes, rice, yogurt because they like them	24	80%
		Elders also suggest these foods as they are soft to digest for young children	22	73%
		Many of the elderly people consider yogurt causing sour throat	26	87%
Perceived difficulty		Milk and eggs are usually a source of earning, so, our children hardly get any of them	22	73%
		If some milk remains it is preferred to be used in tea	21	70%
		Lack of knowledge about good food and bad food	22	73%
		Lack of skills related to modern food preservation techniques	18	60%
		Access to marketplace in order to purchase food	16	53%
		Low economic conditions to purchase food for children	18	60%

Table 1.

As the focus of this paper is to present a detailed description of the qualitative data in relation to cultural norms that influence mothers' selection of food for their children, data are presented textually with quotes to illustrate findings.

3. Results

Analysis of focus group data revealed several factors related to cultural norms that influence mothers' selection of food for their children. The results obtained from the data were clustered by attitudes, subjective norms, and perceived behavioural control being the three elements or variables under the frame of TPB.

The study finds that all three variables of TPB, be it attitude, subjective norms or perceived behavioural control have certain influence on mother's behaviours toward selecting food for their children. However, the nature of influence may vary from weak to strong, direct to indirect or positive to negative, which is not the focus of this particular study. This study talks about the factors influencing mothers' such behaviours in general.

3.1 Mothers' attitudes towards selecting food for their children

Findings of the study divulge various positive and negative attitudes related to mothers' food selection for their children. In response to the advantages of mothers' food selection for their

children, the majority of the participants (i.e. more than 70%) showed positive attitude. Amongst the positive behavioural outcomes, the most frequently identified statement was the selection of food based on taste rather than its nutritious benefits. Around 80% mothers believed that food should be selected according to the children's taste. They considered it beneficial to select food for their children themselves only because they would choose the food children enjoyed eating. Consequently, children would consume more food. Quantity of food really seemed to matter a lot (Johnson *et al.*, 2015).

3.1.1 Food selection based on taste. Most of the mothers were of the opinion that it was important, in particular for children, that the food was tasty. They also shared their selection of food, for their children, was based on how that particular food tasted. A mother in this regard shared that:

> There is a strong need for mothers to have cooked delicious and tasty food for our children otherwise they will not eat. They [children] even avoid eating meat if it is not cooked well or in less oil...it must be fried deep with variety of spices added . . . my children usually like to eat fried meat.

In addition to their belief of tasty food either being deep fried or with enough spices and oil, they also shared that their children liked food that was cooked well, rather overcooked. For example, if children preferred eating fried potatoes over boiled or mashed potatoes, mothers would also consider taste rather than health benefits of food. They did so because they wanted their children to eat sufficient food, so they did not feel hungry before the next meal. Similarly, certain vegetables such as squash, spinach, cauliflower, etc., were ignored by the mothers due to their taste or they could not cook them well as their children wanted. On probing further, the mothers shared that their children would never eat half cooked food. One of the mothers stated:

> Our children and even the elders do not like half-cooked vegetables; they want it to be well-cooked to the extent that there is oil visible otherwise they would refuse eating because it tastes awkward to them . . . we consider half cooked or boiled vegetables as for those being ill.

Food taste was considered as pivotal in selection of food for their children and this was quite evident among all the mothers. A mother shared that she herself preferred and also advised her children to avoid half cooked food or raw vegetables being not good for health. She perceived raw vegetables to cause constipation while half-cooked food in her opinion would detach children more from having vegetable if even they need to have it. 'We give boiled vegetable to those who get sick and have stomach problems and cannot digest other food. These patients after having such vegetable for quite few days' hate eating the same, once they get well', she said. Taste related other aspects such as boiled vegetables associated with certain diseases, providing them to sick ones appeared to be one of the key factors that influenced mothers' selection of food for their children. Such attitude of mothers ultimately impacted child nutrition in these communities.

However, the data also revealed several negative thoughts associated with mothers' food selection for their children. These statements included lack of knowledge and experience regarding good and bad food for young children and the fear of not choosing the right food, with frequency ranging from 50–57%. While mentioning the negative behavioural outcomes of mothers selecting food for their children, a mother sharing her fear stated: 'there are certain foods that are not suitable for young children. Children may get sick if we give them the food they cannot digest'.

Besides, the positive and negative attitudes, there were few mothers who were not concerned about the issue as one of them mentioned 'It doesn't make a difference who selects food for my children'. Few mothers also shared that they came from families

where children are not provided special meals, but they eat whatever is cooked for other family members.

3.2 Subjective norms related to food selection for young children

Subjective norms were found to be the most influential in relation to mothers' food selection for their children. Participants' responses established that cultural values associated with food were so strictly entrenched in the communities that it was hard to avoid them. Around 70% of the mothers in all focus groups mentioned that they were not expected to refuse or ask questions; they do whatever is expected of them by their families and communities. When considering normative beliefs, many factors emerged that directly or indirectly influenced mothers' food selection for their children. Among these, the most commonly identified factors included the beliefs regarding several locally available foods to be harmful for children, at young age; old age adults being decisive authorities; and traditional food preservation methods.

3.2.1 Beliefs regarding several foods being harmful for children. The findings demonstrate that there exist certain beliefs about several locally available foods being unhealthy and causing physical disorders. Such beliefs amongst the communities heavily influenced mothers' selection of food for their children. Locally available fruit and other nutrient rich foods like milk, eggs and apples were ignored due to the misperceptions associated with its negative impacts on digestive health. Apple, for example, is a fruit that is easily available at every other home in the given context, yet totally ignored in children's daily food intake because it was perceived to cause gastric upsets. The same features were associated with milk and egg. The available milk was used to either make tea or produce other dairy products like butter and desi ghee. Butter was however, the most consumable dairy product in the breakfast. Likewise, eggs being rich in protein were not preferred to be used in summer as considered heavy for children to digest and hence created digestive disorders as per their perceptions.

A participant shared that their family had apple orchids, but their children hardly tasted an apple throughout its harvesting season. The reason she gave was that apples were so hard and difficult to digest for kids. Another participant was also of the view that eating apple caused gastric issues and they therefore asked their children to avoid eating apples. According to her, she believed more in her cultural values in relation to their food choices because they are based on experiences. She continued, 'I always find issues with eating apple and so do my children... despite my doctor advising me to give apple to my daughter because of her iron deficiency after suffering from typhoid'.

The majority of the participants (70%) shared almost the same opinion about their children's daily food intake. They were of the view that the eggs and milk were gastric and caused digestive disorders. These participants shared that their school aged children hardly had a glass of milk all year. They only took milk when they got sick. Some of the mothers also shared that they used milk during sickness for making certain cereals or taking certain medicines as prescribed by their doctors. One of the mothers stated clearly:

> Milk has never been a part of our [they themselves and their children] diet. I think it is good during illness as children get weak. Children also do not like drinking milk. Sometimes when my mother in law forces my kids to drink milk [while they are sick], they drink a glass in one go in order to avoid its unpleasant taste. We have sufficient milk from our cows ... that we sell to earn some money.

The results indicate that mothers themselves did not understand nutritious value of foods like apple and milk that were easily available to them, but rather in excess. They sold most of it to earn money. The key aspects related to its disassociation with young children because they perceived it to be gastric. They appeared to be strictly attached to their cultural norms that prevented them to encourage their children to have these important nutrients. It is also evident

that there is lack of knowledge regarding good foods and their nutritious benefits for children. Everything they tend to know about food, comes from the experiences of their ancestors.

3.2.2 Old age adults being the decisive authority. Old age adults, in particular grandmothers are found to take the ultimate decision about what children ought to eat. More aged people were considered more experienced and thus performed as home-based nutritionists. Most of the participants asserted that their elders (mothers and mother-in-laws) had a very influential role in selecting food for their children. Amongst the participants, mothers who were of greater age, were more in favour of the role of grand elders as it allowed these women to exercise more power over other family members.

However, younger mothers were of the view that every mother should be able to know about good and healthy food for their children. Yet these mothers had to follow what was a common practice at home and in community at large. This seemed that despite having a sense of selecting good food for their children they were unable to avoid the established social norms. As many as 73% mothers expressed that even if they had some knowledge of what was good for their children, they could not argue with elders because it showed disrespect.

A mother shared her experience that whenever her child got sick, she was blamed for having something wrong to eat. Consequently, her mother-in-law would not allow her to feed her own child for days and that, according to her, was the biggest punishment for a mother. She continued:

> I understand that a child needs good food and I try to give my daughter some fruits, but a sense of fear follows all the time. I have to hide what I feed to my daughter. . . when she [her grandmother] sees me then she always scolds me.

In addition, the male counterparts, i.e. the fathers, who are comparatively more educated and do have a greater say at home in such a male dominated society, preferred to keep silent. They did not want to disturb the status quo. Moreover, 93% mothers said that their husbands would expect them to quietly obey what their elders asked them to do. They would otherwise get angry with their wives.

The study also reveals that these elderly women are believed to be more skilled and knowledgeable than certified paediatricians in the area. They would not only decide what the children ate but also cured young children with certain homemade self-medication recipes. Even among the participants, the elderly females were also found to be well-skilled in using various foods as medication and homemade dairy products, like butter and ghee, were used to treat children with abdominal issues. A mother expressed, 'She [her grandmother] has made us learn to use butter and ghee when our children have certain abdominal disorders. We use them [ghee and butter] orally and for the massage on their abdomen'. Another mother shared almost the same views. She stated:

> I mostly use ghee and butter to cure my 6 years old child from abdominal pain. . .. This is very much effective and even far better than the medicine that the doctor prescribes. . .. It is low cost, easily available and effective. . . I always suggest my neighbours to try the same.

3.2.3 Traditional food preservation methods. The study found that most of the families continued to use dried meat, despite fresh meat being available, as they wanted to carry out their long tradition of preserving meat for winters. In order to do so, they would dry the available fresh meat and store in a dry place. This practice was very common in these communities. A participant stated that:

> Landhi [traditional name of dried meat] has been our favourite food. Our kids love winters because of Landhi. That meat is so delicious. . . it also reminds us of our forefathers who would do the same. . . we [themselves and their children] therefore love to carry out this practice. The children would always ask for Landhi in winters because it is their favourite food.

More than 80% participants were of the view that their cultural practice of dried meat was vital for their cultural identity. They encouraged their children to continue the same. They felt it to be more associated with their traditional values than being food only. They gave young children Landhi instead of fresh meat to get them acquainted with their culture. A mother openly expressed:

> I know fresh meat is better for health, but I have no other option. We keep the meat to dry for several days or sometimes for months and then cook it. It is not because we think it is better for health but only because we want to keep our tradition through generations.

Participants shared that it was not merely a traditional food but more than that. It was taken as symbol of high status on a serious note. Those who had Landhi [dried meat] throughout the year, were known to be well off families of the community. A participant was of the opinion that in their communities it was not viewed well or even dishonourable if someone did not have dried meat at home. She continued to narrate with a sense of pride:

> My father in law always makes dried meat available for our kids in the winters... we cannot think of eating vegetables in winters. He [her father in law] thinks, and rightly so, that we cannot see our children looking at others [neighbours] dried meat rather than having their own. He [her father in law] always manages it even though it costs enough money as lambs are so expensive these days.

These participants perceived the availability of dried meat in their homes with so much worth with relation to following their cultural values. Their strong attachment with their cultural values had made them believe that making dry meat available in winter was one of the key elements of their food and without this, their meal was incomplete. As a consequence, they would leave their children with having no vegetables in winter, thus missing out important nutrients.

3.3 Perceived behavioural control

When asked about the supporting and hindering factors related to mothers' selection of food for the children, participants provided numerous obstacles for limiting them to do so. These factors include, lack of knowledge and skills about how to prepare tasty, yet nutritious food, and economic constraints. However, they could figure out fewer factors that were supportive to their such behaviour. When discussing what makes it easy for them to select food for their children, the availability of foods such as apples, eggs, milk and other related products at home was highly appreciated.

3.3.1 Availability of local foods at home. The availability of certain local foods such as vegetables, fruits and nuts at the household level according to mothers had made it quite easy for them to select food for their children. Around 80% participants considered themselves fortunate to have foods like milk, butter, yogurt, and eggs easily available at home. Children, according to them, enjoyed eating fried potatoes that are easily available and not so costly. Mothers also appreciated that their children enjoyed eating apple and raw vegetables such as cucumber and carrots, but they perceived these to be hard for children to digest and caused abdominal disorders.

In addition, there were foods that were produced at home including milk, butter, yogurt, etc. For example, as a part of their tradition, they kept cows and goats at household level and the women were found to be the in-charge for milking them as well as for proper utilization of that milk. While sharing her responsibilities in this regard a mother said, 'We use the milk to make many other dairy products. We turn milk into yogurt, make lassi, and extract butter. Our children enjoy eating butter in breakfast. They also like eating yogurt during lunch and dinner'.

However, 87% mothers, had different views and experiences in this regard. They agreed that they were also engaged in the same activities, but they could not make use of these products for their children. Amongst them a mother shared:

> My children usually eat potatoes, rice and yogurt because they like them. Our elders also suggest these foods to be soft to digest for young children. Even then, we are not allowed to add yogurt in children's meal throughout the winter because they [grandmothers] consider yogurt to cause sour throat in winter.

Similarly, most of the households in those communities kept hens to use the eggs for several purposes. When it came to utilizing those eggs to improve child nutrition, they were again faced with several misconceptions. Where yogurt was perceived to cause sore throat in winter; eggs were notorious for causing skin rashes in summer.

Results also showed an overlapping between perceived behaviour control and other variables of Theory of Planned Behaviour. These factors could make it easy for mothers to select better food for their children if the socio-cultural norms were not more suppressing and influential in the given context. However, mothers were generous enough to highlight factors that were making it difficult for them to select better food for their children in the current scenario. They were open to talk about their own lack of knowledge and skills related to food and cooking, as well as the other barriers for them to selecting food for their children.

3.3.2 Mothers' lack of knowledge and skills. Most of the participants (i.e. 73%), and young mothers in particular, emphasized that their lack of knowledge about good and bad food was a barrier for them to select food for their children. They said that they were not aware of what young children required to eat for a better health, they could not make bold decisions and ultimately depended on their mothers or other elderly women in family. A mother stated:

> I think if I had some knowledge about what food was good and what was not; it would be easier for me to select food for my children. There are many foods available at home, but I cannot decide which ones to select.

Participants realized that the lack of sufficient knowledge about healthy food had shattered their level of confidence. They found that they were unable to make the right decisions about the best foods for their children. Being mothers, they were also surrounded by fear; the fear of harming their children, the fear of being blamed for doing so and the harsh reaction received from other family members. A mother narrated:

> Even if I know that food such as milk, yogurt and eggs are essential for child nutrition, I cannot argue with elders because they have lots of personal experiences to share. And I do not have the basic knowledge of why these foods are necessary in children's daily meals.

In addition to the lack of required knowledge of healthy food, mothers were unskilled with various ways of cooking that could appeal to children's taste and provide required nutrients as well. They had only learnt few traditional dishes and they continued to cook the same because the adults liked them. Most of the mothers said that they did not cook anything special for children. Children ate whatever was cooked. They also shared that they lived in joint families consisting of more than ten to twelve members and they were responsible for cooking for the entire family so they would hardly cook vegetables because it is time consuming.

> We usually cook meat adding enough gravy so that everyone eats well. We do not get time to cook several dishes. Children also eat what is cooked. All my children have grown eating the same and there is nothing special about children, (mother of four).

Findings of the study exhibited some differences in the views of the mothers with three to four children and of those with their first or second child. The mothers with more children

considered themselves more experienced than the young mothers but they were also more rigid towards changing their views or accepting ideas other than their own.

The young mothers on the contrary, showed more enthusiasm towards the art of cooking tasty food and providing nutritional benefits to their children. While describing the likes and dislikes of young children, many of them shared that their children loved eating sauces and fruit jams, but they did not know how to prepare them at home from fresh fruits and vegetables. They said that they had heard about some modern food preservation techniques, but they have never learnt them. A mother in this regard said that they usually had lots of tomatoes, apricots and apples at home, but no one ate them raw. After they rotted, they were used to feed cattle. She wished she had known how to make fruit jams and tomato sauces for her children because they enjoyed eating them. These foods, although, may not be as nutritious as the fresh fruits and vegetables, but doing so according to her would not only restrain kids from canned jams and sauces but it would also save money.

3.3.3 Economic constraints. The study also revealed that many families had healthy foods available at home. They produced foods like e.g. milk and other dairy products, and various types of vegetables at household level. Agriculture as the main source of earning in those areas, meant that prosperous families had their own orchids of apple and they also grew their own vegetables. Others kept cattle to produce milk and other dairy products. Even then, children did not get enough of these foods such as milk and egg as they were usually a source of earning for poor families, as apples and vegetables were grown and supplied for business purposes. According to mothers, they sold these foods to fulfil other needs. Sharing the same, a mother said:

> We work hard all day to get that milk and produce yogurt and butter, but our children hardly get any of that. We sell most of the milk to earn a living. If some milk remains, it is preferred to be used in tea than giving fresh milk to kids because of it being gastric.

In addition to that, mothers shared that they had nothing in hand, no power, no decision-making, and no money. Few mothers elaborated upon their role in selecting food for their children as they had no say in anything. They could neither decide what to eat for their children nor they could purchase food they considered good for them. Reacting to the current scenario a mother said:

> We work hard all day to enable milk and eggs to be sold but then we do not get money in return. Money automatically belongs to the men. So, we as mothers cannot buy food for our children even if we know it is healthier for them.

According to participants it was not a single issue to be solved but there were several routine hurdles to overcome. Findings of the study revealed that the mothers' behaviours towards selecting food for their children were influenced by several factors. Among them as the results show few factors had a positive impact on their given behaviour and the others negatively influenced mothers' behaviour towards selecting food for their children.

Findings of the study present it clearly that the three TPB elements, the attitudes, subjective norms, and PBC do influence mothers behaviours towards selecting food for their children one way or the other. However, there are differences in the levels and patterns of influence each element has on mothers' such behaviour. In fact, most of the mothers who participated in the study had a positive attitude towards selecting food for their children, but they were unable to behave accordingly due to direct or indirect influence of other factors deriving from subjective norms and perceived behaviour control. Results also show an overlapping among the three variables. The variables of attitude and PBC are strongly governed and directed by the subjective norms.

4. Discussion

This study aimed to explore factors that influenced mothers' behaviours towards selecting food for their children. In order to have an in-depth understanding of mothers' such behaviours, Ajzen's Theory of Planned Behaviour (TPB) was employed using a qualitative approach. Theory-driven qualitative approaches according to Lindsay *et al.* (2006) are extremely important while studying human behaviours. As a means to gather essential data, proper discussion guides were developed to facilitate the discussions. Mothers of children aged 4–7 years were purposively invited to participate in the study to specifically focus on mothers' selection of food for their primary school age children. Findings from the focus group discussions reflected the socio-cultural context with certain food related norms that had heavily influenced mothers' selection of food for their children.

Studies exploring the causes for poor nutrition among school age children in Pakistan and other parts of the world, mostly found non-availability of food as the main problem (Arif, 2004; Cook and Dahdah *et al.*, 2006; Esfandiari *et al.*, 2018; Fisher *et al.*, 2015; Melgar-Quinonez and Kaiser, 2004; Rosegrant and Cline, 2003). Arif *et al.* (2014) on the contrary, found that the poverty status of a household was not significantly associated with childhood malnutrition. They rather found that the nutritional status of children in Pakistan was due to illness, health care services and other environmental factors, such as unavailability of flush toilet system at village level. However, this study being conducted in agriculturally rich areas of Balochistan identifies certain cultural norms and behaviours that discourage the use of important locally available nutrients. In the current study, for example, two of the important nutrients iron and calcium were not sufficiently taken due to avoidance of their key sources like apple and milk. The same norms abide these communities to consume dried meat in winter rather than available fresh meat. In addition, avoiding vegetables either for the whole winter season or due to its taste had left their children missing out other nutrients required for healthy bodies. These cultural norms thus prohibit mothers from feeding their children with healthy and nutritious food already available at home.

Moreover, from a theoretical perspective, the findings of the study provide empirical evidence of the application of the Theory of Planned Behaviour in exploring factors that influence mothers' behaviours towards selecting food for the children. TPB within its three main elements that is to say attitudes, subjective norms and PBC, was able to identify multiple factors with subjective norms being highly influential while attitude was found to have minimum influence one mothers' such behaviour. Though attitude usually has a significant influence on one's behaviour (Chan and Tsang, 2011; Fila and Smith, 2006), it was found to be the least influential in this study. PBC on the other hand was found to have moderate association with mothers' behaviours towards selecting food for their children. This finding stands in contrast with previous research that has reported negative PBC-behaviour associations with health compromising behaviours (McDermott *et al.*, 2015; Topa and Moriano, 2010).

Although each element in its place has some kind of direct or indirect association with mothers' behaviour, it is evident from the participants own words that thoughts and behaviours are more controlled by the surrounding social norms. For example, mothers' beliefs about easily available foods such as apple, milk and eggs associated with causing physical disorders, was highly considered by majority of the participants. In addition, milk and eggs were considered merely to cure certain disease, such as egg was for patients affected by cough and cold. These are few of the food related cultural norms that are not only believed but strictly practiced in almost every family by the virtue of elderly people. Such findings correspond with other qualitative research emphasizing the central importance of family as the unit of change (Neuman *et al.*, 2019). This also suggests that any interventions to scaling up child nutrition will not be successful without considering grand-parents or elders, parents and children as a complete unit (Novilla *et al.*, 2006), rather than viewing the child in isolation.

More aged female members in family or community being considered authoritative in food selection for children, was also a prominent factor. The words of older individuals (grandmothers) for selecting food for young children were found as final and accurate. This is almost similar to the precious studies (Cook and Dahdah *et al.*, 2006; Davis *et al.*, 2003) in terms of elders' selection of food for their grandchildren (Black *et al.*, 2007). Neuman *et al.* (2019) also identified grandmothers as sources of knowledge and support in terms of child nutrition. Their findings also put strong emphasis on the influential role of grandmothers and other women of earlier generations described as role models for good parenting. In the current study however, there appeared to be an additional aspect related to their authority to cure young children with using certain homemade dairy products. This aspect may seem to be positively related to child health but considering nutrients just when one gets sick could not be deemed as a positive perspective towards child nutrition. As results indicate, some mothers, mostly young ones, thought that food selection should be their domain, however, elder mothers being culturally so dominant, could not pursue the food choices for their children. This transpires a sense of realization at the end of young mothers to have inclined towards changing the cultural norms that negatively influence healthy food selection for their children. Some support from the family may be helpful in this regard but there is a dire need for more awareness at the community level with targeting both male and female members (He *et al.*, 2005; Green *et al.*, 2003).

It was found that most of the families despite living in cities and having fresh meat available, preferred to opt for their long historical culture of eating dry meat in winters. Long ago when there were less means of communication available and food would become scarce in winter then these communities would dry meat in the beginning of winter and would keep eating it throughout the season. This was quite interesting that they still felt associated with the practices of their forefathers despite considering the changes in lifestyles and realizing the importance of fresh meat. More importantly, this exercise being less economical has still remained intact in these communities. Participants mentioned that they dried and used lamb meat, despite being so expensive because it was the culture of their forefathers that they proudly followed. These findings are similar to a US study (Cook and Frank *et al.*, 2006) that found an ethnic group being so strongly associated with their previous food related practices. It transpires that people around the world, be developed or developing countries, do have strong ties with their cultural norms related to food selection in particular. Mothers in the current study were inclined towards selecting food on the basis of taste rather than food ingredients. It was the factor associated with mothers' attitude towards selecting food for their children. They were confident in saying that they ate for taste and not for health, while half cooked or boiled food according to them was only for those suffering from certain physical illness. Avoiding certain vegetables like squash, eggplant, cauliflower and boiled potatoes, seem to have causing malnutrition in their children due to these cultural norms.

The findings of this study support previous studies conducted to explore factors influencing middle school student's fast food consumption behaviour (Seo *et al.*, 2011). They also found the 'important others' (subjective norms) such as friends and companions to be the major source of motivation towards the given behaviours (Mellor *et al.*, 2010). However, in this study, the participants were neither motivated nor influenced by their companions, rather there was a sense of fear and control. Findings suggest that mothers perceived more pressure from the people around them, than their own beliefs and the perceived ease or difficulty to do so. Subjective norms were found to be more influential than attitudes, which is contrary to many TPB studies that find subjective norms to be the weakest predictor of people's intentions or behaviours (Armitage and Conner, 2001).

5. Implications

This study explored the influence of socio-cultural norms of a particular ethnic group on nutrition of their primary school going children. The study makes an important contribution to understanding the factors that influence mothers' decision-making processes to select food for their children. The findings being limited to only certain available foods in a particular context and norms limited to a specific ethnic group may not be generalizable to all settings. Yet, they provide a deeper understanding of the factors influencing mothers' behaviours towards selecting food for their children. The findings are qualitative and are thus not intended to be generalized but they generate insights about considering the importance of cultural norms that may be associated with certain food across the globe and need to be investigated from the perspective of findings its roots in cultures of a particular ethnic community.

The findings reveal that subjective norms are the strongest factors in association with mothers' food selection for their children. Socio-cultural norms in relation with child nutrition have significant implications for academia, researchers, health professionals and practitioners, and schools. All of them need to consider the importance of cultural norms while planning to scale up child nutrition. For the school and school policy makers the findings clearly draw upon a close relationship between school and community and most importantly between cultural values and nutrition. The finding may help design culturally appropriate nutrition education programs (Davis *et al.*, 2003). The results also suggest the need to focus on how to enable communities to effectively use easily available resources as rich source of nutrients for their children and the same may also imply future research.

6. Recommendations

It is evident that subjective norms have a greater influence on mothers' behaviours than their attitude and PBC. With relation to its implications there is a need for more close coordination with mothers to reach community. The establishment of close and meaningful relationships between school and community can define and inform more effective nutritional practices. More importantly schools need to look at the issue of how mothers could be made more aware of the balanced diet for their children. In particular, realizing their cultural food landscape and integrating it with the modern child nutrition strategies. Future research may consider exploring about factors associated with behavioural changes amongst the rural women with relation to food selection for their children. An investigation about the indirect influence of mothers' food selection on their children's physical and academic development could also be an area of interest. Schools' role also becomes pivotal in enhancing community understanding about child nutrition and in particular regarding the credibility of their misconceived cultural norms. These socio-cultural norms need to be replaced with realistic and supportive ones to achieve better child nutrition.

Future research may focus on school community relationship regarding child nutrition and in particular the role of school management or parent school associations, if there is any, to be explored through future research in this regard. In addition, further studies may encompass the exploration of other cultural aspects that my support child nutrition because there might be certain cultural norms and values that have a positive influence on child nutrition. Finally, further explorations as already proposed by (Cook and Frank *et al.*, 2006) bonding and bridging of social and cultural capitals associated with family eating practices and behaviour among different ethnic groups may contribute to theorization of interethnic communities and countries and may lead to culturally appropriate nutrition education programs in schools (Davis *et al.*, 2003).

7. Conclusion

Results showed that the mothers' behaviours towards selecting food for their children is influenced by their own beliefs based on the evaluation of the expected behavioural outcomes, social pressure from the people important to them and perceived behavioural control. This study enabled identification of mothers' attitude to food selection based on taste rather than its nutritious value and perceived ease or difficulty to select food for their children. Certain factors within PBC element could be supportive to mothers' such behaviour if not suppressed by the subjective norms. The pressure from family or other community elders appeared to be influencing mothers' attitudes and perceived behavioural control. These findings are therefore vital in providing a foundation for health care professionals, educators and policy-makers to raise awareness among young mothers to improve the health of school aged children. Specific theoretically based educational interventions (e.g. based on the TPB) designed to change behaviours should target these factors and evaluate subsequent changes in behaviour.

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Corresponding author
Fozia Ahmed Baloch can be contacted at: foziaahmed4@yahoo.com

Malaria classroom corner: a school-based intervention to promote basic malaria awareness and common control practices among school-age children

Received 7 November 2019
Revised 6 February 2020
25 March 2020
Accepted 26 April 2020

Uchechukwu M. Chukwuocha, Greg N. Iwuoha, Chisom M. Ogara and Ikechukwu N.S. Dozie

Department of Public Health, Federal University of Technology Owerri, Owerri, Nigeria

Abstract

Purpose – This study assessed the effectiveness of malaria classroom corner (MCC), school-based intervention in the promotion of basic malaria awareness and common control practices among children of primary school age.

Design/methodology/approach – A quasi-experimental design was employed, involving 206 children of primary 5 and 6 classes from two randomly selected public primary schools in Owerri, South Eastern Nigeria. The MCC was designed and set up in the intervention school (with 103 children) while the control school (with 103 children) was offered malaria health talk. Structured pre-tested questionnaire was used to collect data pre- and post-intervention in both schools. Data was analysed using Statistical Package – Stata version 14.1 (Stata Corp, College Station, TX, USA).

Findings – Results show that there was a significant enhancement of basic malaria awareness ($p = 0.0003$) and common preventive and management practices ($p = 0.0202$) among children in the intervention primary school compared to those in the control primary school.

Research limitations/implications – The study did not account for actual behaviour change, as its scope was within basic malaria awareness and common control practices.

Practical implications – This approach could enhance awareness and proactiveness of school children towards malaria prevention and overall health consciousness.

Social implications – This could help in achieving a healthy population of school children with a positive effect on their school performance.

Originality/value – The MCC could provide a simple, participatory and effective approach for the promotion of basic malaria awareness and common control practices among primary school-age children in malaria endemic areas. Such children could, in turn, become malaria conversation drivers and behaviour change agents in their homes and communities, thereby contributing to the malaria elimination efforts.

Keywords Malaria, Primary school-age children, Awareness, Control practices, Malaria classroom corner

Paper type Research paper

Introduction

Malaria is a very devastating parasitic disease that is well known and endemic in the tropical regions of the world (WHO, 2019). Efforts are ongoing towards its control and eventual elimination, involving mainly preventing transmission through vector mosquito bites and

The authors acknowledge the administration of the Community primary school, Umuguma and Model Primary School, World Bank area, Owerri, Nigeria, for the permission they granted them to carry out this study in their schools. The authors appreciate the classroom teachers of the primary 5 and 6 classes of these schools for participating as facilitators. The authors also appreciate the parents who gave consent as well as all the children who participated in this study.

Competing interests: The authors declare that they have no competing interests.

Funding: No funding was received for this study.

Health Education
Vol. 120 No. 1, 2020
pp. 107-119

0965-4283
DOI 10.1108/HE-11-2019-0050

effective management of infections. Common malaria preventive practices include environmental management, use of insecticide-treated bed nets (ITNs), indoor residual spraying (IRS) and intermittent preventive treatment (IPT), promoted through social as well as behaviour change communication. Practices for the management of infections, on the other hand, include prompt recognition and diagnosis by microscopy or rapid diagnostic tests (RDTs) and appropriate treatment with the recommended artemisinin-based combination therapies (ACTs). Irrespective of the fact that these measures are proven to be effective in reducing malaria incidence (Sumari *et al.*, 2016; WHO, 2016), the rate of malaria mortality and morbidity is still high in most poor endemic areas in sub-Saharan Africa (WHO, 2019). Countries in sub-Saharan Africa such as Nigeria bear the highest global burden of the disease. Nigeria is reported to account for 25% of global malaria burden and 19% of globally estimated deaths from the disease (WHO, 2018).

Malaria is a common disease among school pupils in Nigeria and other tropical endemic countries. In fact, a previous study in Imo State, South Eastern Nigeria, had encountered as high as 83.1% rate of malaria parasitemia among children above six years of age (Austin *et al.*, 2014). It is quite common for primary schools to record absenteeism of pupils and loss of school days due to malaria (Vorasan *et al.*, 2015; Okwa and Ibidabo, 2010). However, malaria prevention and treatment intervention programmes at present less commonly focus on children of primary school age (those between the ages of 6 and 13 years). Most malaria control interventions for children only focus on the under-five children. This is despite the fact that children of primary school age are an important group that should also be essentially given priority attention in malaria control interventions (Walldorf *et al.*, 2015).

Evidence has shown that school pupils are powerful carriers of messages taught in schools (Vorasan *et al.*, 2015). They openly share experiences and materials with their families, peers and the surrounding community. They serve as a medium of communication to their respective households and communities including health messages (WHO, 2014; Bobek and Tversky, 2016). They also tend to influence activities at home by practicing what they learnt at school.

There are very limited studies accounting for malaria awareness, attitudes, behaviour and practices among children of this age group (Sumari *et al.*, 2016). There are also no specific and deliberate strategies and programmes in primary schools in Nigeria and probably in other malaria endemic areas focussed on promoting basic malaria awareness and control practices among children of primary school age. This is despite the fact that a previous WHO report had observed that malaria education on knowledge communicated in schools has the potentials of permeating the community from pupils (WHO, 2014). Furthermore, school-based interventions have been used and judged successfully in child nutrition improvements (Maryam *et al.*, 2015). It has been suggested that equipping children with appropriate basic awareness about health issues and common ways to control them could translate to getting them empowered to promote community healthy life using the approach they learned in schools (Makoge *et al.*, 2013).

This study therefore aimed to design and assess the effectiveness of a school-based intervention named malaria classroom corner (MCC) in promoting basic malaria awareness and common control practices among children of primary school age in Owerri, South Eastern Nigeria.

Methods

Study design

This is a quasi-experimental study assessing the effectiveness of the MCC in promoting basic malaria awareness and common control practices among children of primary school age in Owerri, South Eastern Nigeria. Two primary schools were involved in this study, of which MCC was introduced in one school (intervention) while health talk was offered to the other

primary school (control). These two schools were randomly selected from the register of public primary schools in Owerri after stratification into Owerri Municipality and Owerri West. This was done to avoid contact between pupils of the respective schools, preventing exchange of experience or ideas concerning the project. Only the pupils in the primary 5 and 6 classes were included in the study due to their abilities to read, comprehend and draw more than pupils in the other classes.

Study setting

The study was carried out in two primary schools in Owerri Capital Territory, South Eastern Nigeria. Owerri has a typical tropical rain forest vegetation with two seasons, the rainy season (February/March–October) and the dry season (October–March). The temperature is 30°C and the humidity is 81%. These conditions are typical for malaria endemicity.

The two primary schools involved in the study were the Model Primary School, World Bank, Owerri (intervention primary school), located in Owerri Municipality and the Community Primary School, Umuguma (control primary school), located in Owerri West. These areas are all within the Owerri Capital Territory, South Eastern Nigeria. Both schools are managed by the Imo State Universal Basic Education Board.

Study population and sample size

There were a total of 1,135 pupils at Community Primary School, Umuguma and 1,156 pupils in Model Primary School, World Bank. Since the study design required pupils that could read and understand the displays, only the pupils at primary 5 and 6 classes were included in the study comprising 164 pupils from the Model Primary School, World Bank and 140 pupils from the Community Primary School, Umuguma.

To determine the study sample size, we assumed 50% malaria incidence and targeted a 10-percentage point increase in knowledge about malaria among the pupils over the period of three months, with 5% level of statistical significance (α) and 80% statistical power of the study ($1-\beta$), leading to sample size of 103 for each group.

Sampling technique

At first, schools in Owerri were stratified into those located in Owerri Municipality and those located in Owerri West as captured in the register of primary schools in Owerri Capital territory, South Eastern Nigeria. One school was then randomly selected in each group through balloting, leading to the selection of Community Primary School, Umuguma and Model Primary School, World Bank, all in Owerri, South Eastern Nigeria.

The intervention (malaria classroom corner)

The MCC was designed and introduced only in the primary 5 and 6 classes of Model Primary School, World Bank, Owerri, Nigeria, selected as the intervention school. The MCC was set up in a convenient corner at the back of the selected classrooms with a height of 4ft from the floor. In this corner, simple posters, messages and drawings about malaria were arranged and displayed for easy access for the pupils. Prior to setting up the MCC, an oral assessment was first conducted on the pupils to ascertain their attractions and how they wanted the corner to be. This helped inform the design and materials used for the MCC. The messages displayed include those on the causes, symptoms, treatment and prevention of malaria in very simple and plain language. Other materials displayed include rapid diagnostic test (RDT) kits, ACT drug packs and ITN hung on the wall within the corner. The pupils were allowed access to read and experience the MCC at designated periods and during their free periods, with their classroom teachers giving explanations when necessary. Each pupil who had read and understood the messages wrote about or made their own drawing on the malaria message

and the best ones went to the MCC. This also made the pupils to exhibit creativity through this process. The MCC was displayed for a period of three months (3 months) and was followed by post-intervention data collection, two weeks later.

Control

The control group comprised of primary 5 and 6 class pupils at Community Primary School, Umuguma, Owerri, Nigeria. They only received the health talks on malaria on their moral instruction days. The health talk was delivered by trained community health officers.

Data collection

Data was collected pre- and post-intervention using a structured pre-tested questionnaire. Initially, self-administration of the questionnaire to the pupils was a challenge. However, the respective classroom teachers were trained and involved as facilitators in this process. They helped in distributing as well as clearly and slowly reading out the questions and options to the pupils for them to tick their preferred options. Explanations were made to the pupils including using the local language where and when necessary. Completed questionnaires were checked and collected immediately after completion by the classroom teachers who properly arranged and transmitted them to the researchers who closely supervised the entire process.

Data analysis method

Data was analysed using the Statistical Package for Social Sciences version 14.1 (*Stata Corp, College Station, TX, USA*). Initial data analysis included construction of frequency distribution based on responses to questions. Data was carefully examined and non-parametric method was used to test differences in the data after normality assumption could not be guaranteed with Kolmogorov–Smirnov test. Hence, Wilcoxon signed-rank test was used to test for paired differences between the pre- and post-intervention responses for the intervention and control schools, respectively. Wilcoxon rank-sum test (Mann–Whitney U test) was also used to compare post-intervention scores in the two primary schools of study, so as to establish the effect of MCC intervention. Statistical analysis was performed at 5% significant level.

Ethical considerations

Permission for this study was obtained from the heads of the two primary schools involved. Informed consent was sought and obtained from the parents or guardians of the participating school children. Ethical approval was given by the Ethical Committee of the School of Health Technology, Federal University of Technology, Owerri, Nigeria.

Results

Characteristics of study pupils

A total of 206 pupils were included in the study with 103 each for the MCC intervention school (Model Primary School, World Bank) and the control school (Community Primary School, Umuguma) where health talk on malaria was offered. The basic characteristics of the pupils (Table 1) were such that 83 (40.3%) were 8–10 years, [43 (41.7%) in the control primary school and 40 (38.8%) in the intervention primary school]; 123 (59.7) were between 11 and 13 years with 60 (58.3%) in the control and 63 (61.2%) in the intervention school.

The females were altogether 132 (64.1%), comprising 67 (65.1%) from Community Primary School, Umuguma and 65 (63.1%) from Model Primary School, World Bank area. The pupils in primary 5 and 6 classes were 44.2 and 55.8%, respectively. The primary 6 class

Characteristics	Control: Community Primary School, Umuguma (n = 103) Freq	%	Intervention: Model Primary School, World Bank (n = 103) Freq	%	Total (n = 206) Freq	%
Age						
8–10	43	41.7	40	38.8	83	40.3
11–12	60	58.3	63	61.2	123	59.7
Gender						
Male	36	34.9	38	38.9	74	35.9
Female	67	65.1	65	63.1	132	64.1
Class						
Primary 5	48	46.6	43	41.8	91	44.2
Primary 6	55	53.4	60	58.2	115	55.8
Person residing with						
Parents	59	57.3	57	55.3	116	56.3
Guardian	44	42.7	46	44.7	90	43.7
Family religion						
Christianity	94	91.3	92	89.3	186	90.3
Islam	9	8.7	11	10.7	20	9.7

Note(s): Freq – Frequency, % – Percentage

Table 1. Characteristics of study pupils

pupils were 53.4% in Community Primary School, Umuguma and 58.2% in Model Primary School, World Bank area.

About 56.3% of the study pupils resided with their parents, comprising 57.3% at Community Primary School, Umuguma and 55.3% at Model Primary School, World Bank. The pupils were predominantly from Christian families (90.3%), with 91.3% at Community Primary School, Umuguma and 89.3% at Model Primary School, World Bank area.

Malaria awareness and experience

Malaria awareness was high among the pupils. Table 2 shows that all the study pupils knew about malaria and the major sources of information include parents and guardians at home (33.0%) and school (30.6%). About 73.8 and 76.7% of the pupils from the intervention and control primary schools, respectively, had also experienced malaria in the past.

Awareness about the causes, symptoms and transmissibility of malaria

Table 3 indicates the pre- and post-intervention awareness about the causes, symptoms and transmissibility of malaria among the study school children. At baseline, only 42.7% of the pupils at the control school were able to identify "bite from infected female anopheles mosquitoes" as the cause of malaria but that increased to 64.1% at post-intervention. At the intervention school, however, the results were 45.6% at pre-intervention and 92.2% at post-intervention, respectively. Headache, fever and weakness were identified more as symptoms of malaria at pre-intervention (41.8% at control school and 48.5% at intervention school) and post-intervention (60.2% at control school and 81.6% at intervention school). In terms of knowledge on whether malaria is transmissible from one person to another, the pupils that responded "no" were 40.8% (pre-intervention) and 66% (post-intervention) at control school and 44.7% (pre-intervention) and 98.1% (post-intervention) at intervention school.

Variables	Control: Community Primary School, Umuguma (n = 103) Freq	%	Intervention: Model Primary School, World Bank (n = 103) Freq	%	Total (n = 206) Freq	%
Knowledge about malaria						
Yes	103	100	103	100	206	100
No	–	–	–	–	–	–
Total	103	100	103	100	206	100
Source of information about malaria						
Parents/guardian	36	34.9	43	41.8	68	33.0
School	41	39.8	39	37.9	63	30.6
Friends	12	11.7	7	6.8	42	20.4
Radio/television	9	8.7	11	10.7	30	14.6
Other (e.g. health centre, hospitals, etc.)	5	4.9	3	2.9	4	1.9
Total	103	100.0	103	100.0	206	100.0
Previous experience of malaria						
Yes	79	76.7	81	73.8	160	71.8
No	13	12.6	11	10.7	24	14.7
Not sure	11	10.7	11	10.7	22	10.7
Total	103	100.0	103	100.0	206	100.0

Note(s): Freq – Frequency, % – Percentage

Table 2. Knowledge and previous experience of malaria

Awareness about malaria prevention and management

The pre- and post-intervention awareness about the prevention and management of malaria is shown in Table 4. The pre- and post-intervention responses on malaria prevention awareness by pupils in the control school were as follows: indoor residual spraying (25.2% pre-intervention vs 31.1% post-intervention) and sleeping under ITN (33% pre-intervention vs 38.8% post-intervention). Whereas at the intervention school, the responses were as follows: IRS (24.3% pre-intervention vs 40.8% post-intervention) and sleeping under ITN (34.9% pre-intervention vs 54.4% post-intervention).

Furthermore, the responses on awareness about RDT for malaria RDT were 38.8% (pre-intervention) versus 56.3% (post-intervention) at the control school and 33% (pre-intervention) versus 97.1% (post-intervention) at the intervention school. The awareness about ACTs as drugs for malaria treatment was 35.9% (pre-intervention) versus 57.3% (post-intervention) at the control school and 35% (pre-intervention) versus 98.1% (post-intervention) at intervention school.

Effect of MCC on basic malaria awareness among study school children

Table 5 depicts the effect of MCC on overall basic malaria awareness among the study school children. At the control school, overall basic knowledge about malaria increased from 39.8% at pre-intervention to 61% at post-intervention while at the intervention school, it increased from 44% at pre-intervention to 91.9% at post-intervention. Significant difference (p = 0.0077) was obtained between scores at pre- and post-intervention in both schools. Significant difference (p = 0.0003) was obtained for post-intervention scores between the two primary schools studied, indicating the positive effect of the intervention (Table 5).

Variables	Control: Community Primary School, Umuguma (n = 103)				Intervention: Model Primary School, World Bank (n = 103)			
	Pre-test		Post-test		Pre-test		Post-test	
	Freq	%	Freq	%	Freq	%	Freq	%
Cause of malaria								
Dirty environment	28	27.2	23	22.3	34	33.0	4	3.9
Bite of an infected female anopheles mosquito	44	42.7	66	64.1	47	45.6	95	92.2
Exposure to hot sun	20	19.4	9	8.7	13	12.6	3	2.9
Bite by a cockroach	11	10.7	5	4.9	9	8.7	2	1.0
Mosquito breeding site								
Stagnant/dirty water	42	40.8	69	67.0	39	38.8	89	86.4
Waste bin/dust bin	28	27.2	17	16.5	29	28.2	8	7.8
Air/wind	17	16.5	9	8.7	19	18.5	2	1.9
Toilet/human excreta	16	15.5	8	7.8	15	14.6	4	3.9
Symptoms of malaria								
Body pain and sweating	38	36.9	26	25.2	36	35.0	14	13.6
Headache, fever, weakness	43	41.8	62	60.2	50	48.5	84	81.6
Excessive sleeping and eating	9	8.7	7	6.9	8	7.8	3	2.9
No idea	13	12.6	8	7.9	9	8.7	2	1.9
Malaria transmissibility from one person to another (placental transmissibility not included)								
Yes	61	59.2	35	34.0	57	55.3	5	4.9
No	42	40.8	68	66.0	46	44.7	98	95.1
Time mosquitoes usually bite most								
Day time	44	42.7	30	29.1	28	27.2	5	4.8
Night time	38	36.9	59	57.4	59	57.3	92	89.3
Every time	13	12.6	10	9.9	12	11.7	4	4.8
No idea	8	7.8	4	4.0	4	3.9	1	1.0
Those at greater risk of malaria								
Pregnant women and children	29	28.2	52	50.5	34	33.0	95	92.2
Old people	32	31.1	24	23.3	36	35.0	2	3.9
Young people	15	14.6	11	10.7	15	14.6	1	1.0
Everybody	27	26.2	16	15.5	18	17.5	3	2.9

Note(s): Freq – Frequency, % – Percentage

Table 3. Pre- and post-intervention responses on awareness about malaria causes, symptoms and transmissibility

Common practices to prevent and manage malaria

The responses of the study school children on common practices to prevent malaria are presented in Table 6. At the control school, the pupils who responded that they wore trousers and long sleeves to sleep at night to prevent mosquito bites were 33% (pre-intervention) and 38.8% (post-intervention) while at the intervention school, they were 31.1% (pre-intervention) and 39.8% (post-intervention). Closing of doors and windows was reported by 26.2% (pre-intervention) and 41.7% (post-intervention) at the control school and 27.2% (pre-intervention) and 55.3% (post-intervention) at the intervention school.

On notice of malaria symptoms, 40.8 versus 63.1% (pre- and post-intervention) would report immediately to their parents while at the intervention school, 41.7 versus 92.2% (pre- and post-intervention) will do so. Similarly, those that would adhere to instructions given to them regarding antimalarial drug treatment (including taking full prescribed dose) were 34 versus 52.4% (pre- and post-intervention) at the control school and 35.9 versus 80.6% (pre- and post-intervention) at the intervention school. The responses for sleeping under ITNs also followed the same patterns pre- and post-intervention for both schools.

Variables	Control: Community Primary School, Umuguma (n = 103) Pre test Freq	%	Post test Freq	%	Intervention: Model Primary School, World Bank (n = 103) Pre test Freq	%	Post test Freq	%
Malaria preventive practices								
Avoiding oily food	35	34.0	25	24.3	33	32.0	3	2.9
Using indoor residual spraying	26	25.2	32	31.1	25	24.3	42	40.8
Sleeping under an insecticide-treated net	34	33.0	40	38.8	37	35.9	56	54.4
Eating good food	8	7.8	6	5.8	8	7.8	2	1.9
Total	103	100	103	100	103	100	103	100
Malaria diagnostic methods								
Rapid diagnostic test for malaria (RDT)	40	38.8	58	56.3	34	33.0	100	97.1
Microscopic test	34	33.0	31	30.1	36	35.0	3	2.9
Thermometer	27	26.2	13	12.6	31	30.1	0	0.0
No idea	2	1.9	1	1.0	2	1.9	0	0.0
Total	103	100	103	100	103	100	103	100
Medicine for malaria treatment								
ACTs	37	35.9	58	57.3	36	35.0	101	98.1
Paracetamol	45	43.7	25	24.3	46	44.7	2	1.9
No idea	21	20.4	19	18.4	21	20.4	0	0.0
Total	103	100	103	100	103	100	103	100

Note(s): ACTs – Artemisinin-Based Combination Therapies
Freq – Frequency, % – Percentage

Table 4.
Pre- and post-intervention responses on awareness about malaria prevention and management

Description	Mean score (S.D)	Rank sum	p-value
Control			
Community School, Umuguma			
Pre-intervention	39.789 (6.397)		
Post-intervention	60.967 (6.219)		
Wilcoxon signed-rank test		45	0.0077
Intervention			
Model Primary School, World Bank area			
Pre-intervention	44.011 (10.079)		
Post-intervention	91.911 (5.361)		
Wilcoxon signed-rank test		45	0.0077
Control versus intervention			
(At Post-intervention)			
Wilcoxon signed-rank test		171	0.0003

Note(s): SD – standard deviation

Table 5.
Effect of MCC on basic malaria awareness among study school children

Effect of MCC on common malaria prevention and management practices among the study children

Table 7 shows that in summary, the pupils who reported common good malaria prevention and management practices increased from 46.4 to 64.8% at the control school and from 48.1 to 87.4% at the intervention school after the introduction of the MCC. Significant statistical difference was found between the mean pre-intervention score and post-intervention score (p = 0.0042) in each of the two primary schools. Significant difference (p = 0.0202) was also

Common practices to prevent malaria	Community Primary School, Umuguma				Model Primary School, World Bank area			
	Pre test		Post test		Pre test		Post test	
	Freq	%	Freq	%	Freq	%	Freq	%
Personal protection practices to prevent mosquito bites								
Staying indoors	38	36.9	17	16.5	37	35.9	3	2.9
Wearing trousers and long sleeves to sleep at night	34	33.0	40	38.8	32	31.1	41	39.8
Closing doors and windows	27	26.2	43	41.7	28	27.2	57	55.3
Does nothing	4	3.9	3	2.9	6	5.8	2	1.9
Total	103	100.0	103	100.0	103	100.0	103	100.0
Reaction on notice of symptoms of malaria								
Immediate self-report to parents	42	40.8	65	63.1	43	41.7	95	92.2
Report only when illness is serious	41	39.8	29	28.2	41	39.8	8	7.8
Does not report until noticed	20	19.4	9	8.7	19	18.4	0	0.0
Total	103	100.0	103	100.0	103	100.0	103	
Adherence to instructions on antimalarial drug treatment (including taking full prescribed dose)								
Yes	35	34.0	54	52.4	38	36.9	83	80.6
No	41	39.8	34	33.0	42	40.8	8	7.8
Sometimes	27	26.2	15	14.6	23	22.3	12	11.7
Total	103	100.0	103	100.0	103	100.0	103	100.0
Sleeping under an insecticide-treated net								
Yes	53	51.5	65	63.1	57	55.3	84	81.6
No	50	48.5	38	36.9	46	44.7	19	18.4
Total	103	100.0	103	100.0	103	100.0	103	100.0

Note(s): Freq – Frequency, % – Percentage

Table 6. Pre- and post-intervention responses on common malaria prevention and management practices

Description	Mean score (SD)	Rank sum	*p*-value
Control			
Community School, Umuguma			
Pre-intervention	46.374 (11.180)		
Post-intervention	64.775 (11.634)		
Wilcoxon signed-rank test		34	0.042
Intervention			
Model Primary School, World Bank area			
Pre-intervention	48.05 (10.365)		
Post-intervention	87.375 (7.353)		
Wilcoxon signed-rank test		36	0.042
Control versus intervention			
(At post-intervention)			
Wilcoxon signed-rank test		36	0.042

Note(s): SD – standard deviation

Table 7. Effect of MCC on common malaria prevention and management practices among the study children

achieved at post-intervention scores between the two showing that malaria corner had significant effect ahead of the health talk (Table 7).

Discussion

Children of primary school age learn better from what they observe and participate in, compared with usual classroom teaching involving lectures, recitations or seatwork activitie

(Bobek and Tversky, 2016). Knowledge and awareness at that age can translate to character/attitude/behaviour formation. This phenomenon could be applied to the control of infectious diseases such as malaria when children are empowered with the necessary basic awareness and knowledge about the disease and common ways to prevent and manage it. This could in turn translate to their participation in disease prevention and control in their households and communities through driving of conversations and influencing activities by applying or practicing what they learnt in school.

The MCC aims to use this approach in promoting basic malaria awareness and common preventive and management practices among children of primary school age and subsequently make them contributors in the malaria control/elimination efforts in their homes and communities.

In this study, all the pupils at both intervention and control primary schools were aware of the disease called malaria. This was not surprising since majority of them had experienced malaria in the past. High awareness about malaria has similarly been reported among children of this age category in a previous Nigerian study (Eko *et al.*, 2013). However, knowledge about specific malaria issues and concepts was quite low among the pupils at baseline in both our intervention and control schools. For instance, many of the children could not properly identify the cause of malaria and the vector breeding sites and so on. It was, however, observed that there was an enhancement of knowledge about these specific concepts regarding malaria at post-intervention. Significant knowledge increase was found for both the intervention and control groups. This is not unexpected, since it is believed that school-based approaches such as health education are effective in instilling knowledge about diseases (Brooker *et al.*, 2000; Ayi *et al.*, 2010).

Some of the pupils could not identify mosquito bite as the cause of malaria prior to the intervention. Some of them thought that exposure to sunlight, dirty environment and bites from cockroaches are some of the ways malaria could be transmitted. It has been reported that frequent experience with malaria could elicit different wrong perceptions about the disease, particularly among people that are not informed (Cox *et al.*, 2018). This could likely be the case for these children who may not have thought that a sickness like malaria could be transmitted by the small mosquito. Similarly, despite the fact that majority of the pupils had suffered from malaria, a significant number still could not match the correct symptoms to malaria as well as its ability to be transmitted from person to person, prior to the intervention. The same pattern was also observed regarding the low awareness of the children on the ways to prevent and manage the disease including awareness about its prevention and ACTs as the recommended drug for treatment. Poor perception and misconception about malaria transmission, symptoms, prevention and management hinder efforts towards effective control and have been found to be influenced by the level of knowledge and awareness about the disease (Mathania *et al.*, 2016; Debela, 2014). Knowledge and awareness translate to correct perceptions and elimination of misconceptions and encourage behaviour change necessary for effective control of the disease (Mathania *et al.*, 2016). Our study found that after the introduction of the intervention, the general knowledge about malaria as well as awareness about basic aspects of the disease increased for both study groups. However, the children exposed to the MCC had a more significant increase in their basic awareness about malaria compared to those that just received health talk. This possibly implies that the MCC approach had more effect in instilling awareness about malaria in the children in the intervention group than the health talk did for those in the control group. The use of visual aids (drawings and posters), the participatory and interactive nature as well as the strategic classroom location of the intervention are likely contributors to this effect. Visual aids and participatory learning have been observed to be better ways of imbibing knowledge in children compared to lectures (Bobek and Tversky, 2016).

There are common practices at home to at least reduce mosquito bites and manage malaria on time and appropriately that children can engage in. These include wearing of long sleeves and trousers to sleep, closing of doors and windows particularly at twilight and sleeping under bed nets if available. Others are immediate self-report to parents when the child feels ill and not hesitating to adhere to instructions concerning medications including completing their dosages and so on. A very significant number of our study children did not adhere to these common practices prior to the intervention. Specifically, many of the children did not care to sleep under ITNs even when they had them at home, many did not also self-report to their parents immediately when they felt sick, they would rather wait till it was serious while some would not report at all until the illness was noticed by their parents. Previous studies observed similar attitudes, particularly lack of interest in sleeping under ITNs and hesitation to take medications among children (Udonwa *et al.*, 2010; Dress and Enquosellasie, 2000). Feeling of discomfort is likely to discourage children from sleeping under ITNs particularly in warm climates. Likewise, phobia for drugs due to their tastes may also discourage them from self-reporting to their parents when they feel sick. While it may be considered the responsibility of parents/guardians to make their children sleep under ITNs and be conscious enough to recognize when their children are ill to take prompt action, it is equally important to instil in the children the consciousness to do what they can at their age to protect themselves as well as to report to someone once they feel ill. These will help in the more timely management and effective control of malaria and other diseases in children. The consciousness to do these can be instilled through deliberate methods targeted at inculcating the awareness in the child that could encourage positive perceptions, behaviours and practices. In this study, the proportion of the study children who would use ITNs, wear trousers and long sleeves to sleep, self-report to their parents immediately they feel ill, adhere to instructions given to them concerning their medications including completion of their dosages increased significantly at post-intervention. These improvements were more prominent among the children exposed to the MCC than those who received the health talk alone. This corroborates the findings of a previous study in Zambia (Keating *et al.*, 2012), which reported increase in the use of ITNs among school-age children due to a school-based campaign intervention promoting the use of ITNs.

The limitation of this study was that actual behaviour change estimation was not accounted for at this point. This is because it did not fall within the scope of this phase of the study which aimed only at assessing the effect of the intervention on basic awareness and common practices to control malaria. Further studies will, however, focus on behaviour change due to this intervention as well as follow up to determine possible impact on the families and communities of primary school children exposed to the MCC.

Conclusion

This study has demonstrated the potential of the MCC as a school-based intervention that could promote basic malaria awareness and common preventive/management practices among school-age children in malaria endemic areas. The participatory, self-educative and interactive nature of this approach makes this possible. Learning methods with similar characteristics have been proven to improve cognition which in turn leads to attitude and behaviour formation in children (Bobek and Tversky, 2016).

The results of this study have very useful implications for the primary healthcare and development of school children and the society at large particularly in poor endemic areas. This is because children empowered in this way could become very much aware and proactive about malaria prevention and control. Such children could also become malaria conversation drivers and behaviour change agents in their families and communities, thereby contributing to efforts towards malaria elimination. Furthermore, this approach could help instil inquisitiveness and health consciousness among school children not just

for malaria but also for other common childhood diseases and also motivate them to adopt positive practices to prevent disease and maintain good health. This will ensure the maintenance of a healthy population of school children which will in turn positively affect their overall performance in school. Other important attributes of this approach are that it is simple, inexpensive and does not interfere with normal classroom learning. It also has the potential for drawing the needed attention towards support and implementation of school health programmes which are currently neglected in Nigeria and other developing/ underdeveloped countries.

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Corresponding author
Uchechukwu M. Chukwuocha can be contacted at: uchukwuocha@gmail.com