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SHORT COMMUNICATION

Effect of an educational intervention on nutrition literacy in teachers: a short communication

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ABSTRACT

Introduction: Teachers, by creating a culture of health within their classrooms, are agents of change and have an important role during students' formative years. This study aimed to investigate the effect of an educational intervention on the nutrition literacy of primary school teachers in Yasuj. **Methods:** In this quasi-experimental study, 110 primary school teachers in Yasuj, who were randomly selected from two areas of the city (intervention and comparison groups), were included in the study. Nutrition literacy was measured by using a validated tool for the Iranian society. After analysing the data, the educational content and structure were developed to improve nutrition literacy. The intervention consisted of two training sessions, provision of educational pamphlets and sending of two SMS messages. Data were analysed before and three months after the intervention by using SPSS16 software. **Results:** Before the intervention, the mean ± standard deviation of nutrition literacy in the comparison and intervention groups were 27.04±3.15 and 27.25±3.27, respectively. According to repeated measures ANOVA, nutrition literacy score improved significantly three months after the intervention ($p_{time} = 0.001$). Besides, there was a significant difference between the two groups ($p_{group} = 0.03$). The interaction between time and group was also significant ($p_{time \times group} = 0.001$). **Conclusion:** The educational intervention led to an improvement in the nutrition literacy of primary school teachers in Yasuj.

Keywords: Nutrition literacy, nutrition education, teachers

INTRODUCTION

In Iran, nutrition transition has happened owning to urbanisation and speedy socio-economic changes (Doustmohammadian *et al.*, 2020). This general change has resulted in a tendency towards a dietary pattern with low consumption of fruits and vegetables, fibre-rich foods, and dairy products, as well as high consumption of fatty, sugary, and convenience foods (Hajivandi *et al.*, 2020). Iran is facing the prevalence of malnutrition and the challenge of quantitative (the

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intake of energy to alleviate hunger) and qualitative (the intake of other nutrients in addition to energy) food insecurity (Gorji *et al.*, 2017). Growing evidences have shown an association between high nutrition literacy and quality of eating habits (Spiteri & Moraes, 2015, Liao, Lai & Chang, 2019). Teachers are among the major groups contributing to the improved health of the society, especially students' health, by providing formal and informal educational opportunities relative to nutritious eating and healthy lifestyles. They can also have a substantial role in conducting health-related activities at schools, empowering students, and providing nutrition education to the students. Moreover, primary school students are massively influenced by their teachers. Therefore, increasing the nutrition literacy of teachers is a priority in the health services system. This research explored and discussed the effect of an educational intervention on the nutrition literacy of primary school teachers in Yasuj, in a resource-limited setting.

MATERIALS AND METHODS

This study was a before-and-after field trial with a comparison group. The target population of the study was primary school teachers of Yasuj city. To determine the comparison and intervention groups, a list of all primary schools in Yasuj was prepared. Yasuj has two educational districts and 75 primary schools in both districts. Given the close similarity in the demographic information of the primary schools of districts 1 and 2, seven schools from district 1 and seven schools from district 2 were randomly allocated into the comparison and intervention groups using computer-generated random numbers. There was no specific school or teacher's characteristic to consider for the selection. On average, there were eight teachers from each primary school. In each school, all teachers were included in the research.

Assuming that our intervention would increase nutrition literacy by at least 10%, the sample size in the intervention and comparison groups was set based on type I error of 0.05, test power of 80%, mean and standard deviation of nutrition literacy score in the pilot study (27.00 ± 3.17) (on a scale of 0 to 35), a possible attrition rate of 10%, and a design effect of 2. By including all teachers of the selected schools, the final sample size was calculated as 50 for each group (total 100 teachers). But during sampling, 57 teachers for the intervention group and 53 teachers for the comparison group were recruited.

The research scale was a standardised nutrition literacy questionnaire known as the Evaluation Instrument of Nutrition Literacy on Adults (EINLA), which had been developed and validated by Cesur, Koçoğlu & Sümer (2015) in Turkey. Following the translation-retranslation of this instrument, it was approved for the Iranian society with a reliability coefficient of 0.73 (Hemati *et al.*, 2018). After obtaining informed consent from the selected teachers, the questionnaire was provided to them. Teachers who taught first to sixth grades and agreed to take part in the study were included in this research. The following teachers were excluded from the research: teachers who were on longer than one month sick leave, educational missions, maternity leave or leave without pay, teachers who were absent from two training sessions, and teachers who were not available for completing the post-test questionnaire. After baseline data were collected, educational materials and intervention content were developed based on these baseline results. The baseline results showed which components of

the nutrition literacy were poor among teachers (number of servings, numerical literacy, and reading food label) and the educational intervention was focused on these poor components. The educational intervention consisted of two two-hour session training workshops, question and answer session, and group discussions. The first session covered the following topics: definition of nutrition, healthy nutrition, nutrition literacy, food groups, and the association between health and nutrition. The contents of the second session were about numeracy literacy, food labelling, calculation of daily needed calories, the number of servings, amount of the materials received by the body, and body mass index. All of the sessions were delivered by an expert in health/nutrition education. At the end of the second session, three pamphlets were distributed among teachers. These pamphlets covered all contents of the educational sessions. Furthermore, two short messages with the emphasis on the number of servings, numerical literacy, and reading food label were sent to the participants on the next three days after each session.

Due to the high number of members in the intervention group (57 members), the researchers classified them into two groups and each group was trained in two two-hour sessions. Three months following the educational intervention, the questionnaire was once again completed by the intervention and comparison groups. The data were analysed using SPSS version 16. We examined the mean and standard deviation score of nutrition literacy between the intervention and control groups before the study by applying the independent t-test. Repeated measures ANOVA was used to compare changes in the outcome (nutrition literacy score) across time. In this regard, the school and district were also included as possible confounding factors. We also examined the effect of time, group, and time–group interaction by using repeated measures ANOVA.

RESULTS

In this research, 79 participants were females (71.8%) and the rest were males. The mean ± standard deviation for age of the participants in the comparison and intervention groups were 39.62±6.92 and 39.35±6.96 years, respectively. Before the intervention, there was no significant difference in the demographic variables between the intervention and comparison groups (Table 1). Before the intervention, the mean ± standard deviation of nutrition literacy in the comparison and intervention groups were 27.04±3.15 and 27.25±3.27, respectively, and there was no significant difference between these two groups. The effect of the intervention on nutrition literacy is shown in Table 2. According to repeated measures ANOVA, the nutrition literacy score resulted in a significant change, where it improved significantly three months after the intervention ($p_{time} = 0.001$). Besides, there was a significant difference between the two groups ($p_{group} = 0.03$). Also, the interaction between time and group was significant ($p_{time \times group} = 0.001$).

DISCUSSION

It is very important to establish environments in schools that support healthy eating habits before students, especially primary school students, develop poor eating habits. Improving the nutrition literacy of primary school teachers can be an indirect, effective strategy to achieve this goal. In this study, we examined the effect of an educational intervention on the nutrition literacy of primary school teachers. Teachers in the treatment schools had significantly improved nutrition literacy compared with teachers in the comparison

Table 1. Demographic description of the participants

Variables	*n (%)*		*p value*
	Intervention group, n=57	*Comparison group, n=53*	
Sex			0.40
Male	14(24.6)	17 (32.1)	
Female	43 (75.4)	36 (67.9)	
Marital status			0.45
Single	8 (14)	5 (9.4)	
Married	49 (86)	47 (88.7)	
Widow/Divorced	0 (0)	1 (1.9)	
Teaching grade			0.77
First grade	11 (19.3)	11 (20.8)	
Second grade	9 (15.8)	11 (20.8)	
Third grade	11 (19.3)	6 (11.3)	
Fourth grade	8 (14)	11 (20.8)	
Fifth grade	10 (17.5)	8 (15.1)	
Sixth grade	8 (14)	6 (11.3)	
Degree			0.24
Diploma	5 (8.8)	4 (7.5)	
Associate degree	25(43.9)	14 (26.4)	
Bachelor	24 (42.1)	32 (60.4)	
Master's degree	3 (5.3)	3 (5.7)	
Years of job experience			0.15
1-5 years	4 (7)	2 (3.8)	
6-10 years	13 (22.8)	8 (15.1)	
11-15 years	6 (10.5)	15 (28.3)	
16-20 years	10 (17.5)	6 (11.3)	
>20 years	24 (42.1)	22 (41.5)	

Table 2. The repeated measures ANOVA of nutrition literacy between intervention and comparison groups

Variables	*Baseline*	*Three months later*	*p value*†		
			Time	*Group*	*Time*Group*
Nutrition Literacy			<0.001***	0.03*	<0.001***
Comparison group (*n*=53)	27.04±3.15	27.47±3.03			
Intervention group (*n*=57)	27.25±3.27	29.82±2.35			

Values are presented as mean ± standard deviation
†Repeated measures ANOVA
*p<0.05
***p<0.001

schools. This result is consistent with the findings of similar studies. A study was done by Ballance and Webb where five 60-minute sessions were held for teachers of child care centres to improve nutrition literacy among them. The results of their study showed much improvement in the areas of information literacy and nutrition literacy (e.g. how to read nutrition label and what defines whole grain) (Ballance & Webb, 2015). In a study by Montazeri and colleagues, nutrition education interventions were successful in modifying the food and eating patterns of teachers and students (Montazeri, Karaji-Bani & Mohammadi, 2005). Moreover, the study by Rustad & Smith (2013) showed a significant change in the knowledge of nutrition and desired eating behaviour compared to before intervention. In line with our study results, a study by Kupolati, MacIntyre & Gericke (2019) showed that nutrition education programme led to improvements in the teachers' and learners' nutrition knowledge, as well as the learners' nutrition attitudes.

The improvement in nutrition literacy among teachers from the intervention schools could be attributed to the exposure of the teachers to educational sessions, reading of pamphlets, and the messages they received. Our study has several limitations. This study was conducted in a confined area of two districts and with a relatively small sample size. Despite these limitations, the overall outcome of the project is considerably good. However, further researches among teachers of other provinces are needed. Our results have implications for managers of the education system. To improve nutrition literacy of teachers, they can include nutrition education sessions into retraining courses for teachers. It is expected that teachers with high nutrition literacy can have a positive impact on students' nutrition and eating behaviours. These results can also serve to improve the health of teachers in the Yasuj City and other areas of the Kohgiluyeh and Boyer-Ahmad Province.

CONCLUSION

According to the results of the study, educational interventions are effective in improving the nutrition literacy of primary school teachers. In this regard, it is recommended to provide a training course to improve the nutrition literacy of teachers in primary schools. Moreover, the results of this research can be presented to the decision makers in the education administration and also health policy makers to enable them to modify undesirable eating behaviours and promote proper diets. These results can also serve to improve the health of teachers in the Yasuj City and other areas of the Kohgiluyeh and Boyer-Ahmad Province.

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Author contributions

MH, executive manager of the study, collected the data, helped writing the manuscript draft, and followed the modification of the revisions; MAT, conceived the statistical methodology; MS, conceived the statistical methodology, drafted the manuscript, conceived the study design and wrote the final manuscript; AB, wrote and consulted in study design and final version. All authors read and approved the final version of the manuscript.

Conflict of interest

There is no conflict of interest to declare.

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