Effect of Nutrition and Health Education Intervention on Knowledge and Behavior of Women in Puerperium:a Randomized Controlled Trial*

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ABSTRACT Objective: To investigate the effect of the knowledge of nutrition and health education intervention on improving postpartum knowledge and behavior. Methods: The subjects,the late pregnancy women of Qingdao, were randomly divided into intervention group and control group. The objects of intervention group had accepted the education of nutritional and health knowledge. Results: The awareness rate of most nutritional health knowledge of the intervention group was significantly higher than those in the control group. The intervention group subjects from medical staff, books and magazines for nutrition and health knowledge (83.1%, 72.3%) were significantly higher than those in the control group (65.2%, 56%). Women in the intervention group object had intaked more potato, fish, soy products, green leafy vegetables, nuts, dietary fiber, niacin, calcium and vitamin C and lower egg, cholesterolthan those in control group. Conclusion: Targeted nutritional health education can improve the knowledge level of puerperal women and promote healthy dietary behavior. Therefore, targeted nutritional health and knowledge education should be promoted.

Key words: Puerperium; Health education; Education; Intervention

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Introduction

"Sitting month" is a tradition in China for women in puerperium and this tradition has many unreasonable aspects [1,2], such as it emphasizes on eating lots of eggs and other animal food, avoids eating any food of raw or cold food (mainly refers to the fruit, vegetables), with windows and doors closed, bed not move, not wash your hair, not take a shower, no teeth brushing [3,4]. The investigation showed that the level of puerperium nutritional and health knowledge was low in Chinese child-bearing women [5-7]. While the unreasonable structure of diet and little activity will inevitably lead to puerperal period nutritional imbalance and postpartum obesity and other diseases. According to the" health education knowledge-attitude-behavior" model theory [8,9], good behavior should be based on knowledge that is certain knowledge to achieve knowledge-attitude-behavior change. There are survey reports on puerperium unreasonable diet and behavior, but carries on the health education intervention study is few. Therefore, the present study aimed to assess the effects of intervention among the participants.

1 Materials and methods

1.1 Participants

The randomized controlled trial was carried out between 2010 June and October. The participants were selected from the late pregnancy women ,taking prenatal examination in Qing Dao eighth people's Hospital, randomly divided into intervention group and control group. Women in intervention group had received education of nutritional and health knowledge since the day to puerperal period end. A total of 420 people had completed the follow-up survey, from the day to 42 days postpartum, of which the intervention group 213, control group 207.

1.2 Methods

The methods of individual explain and disseminating a guidebook were used to educate the intervention group subjects. The guidebook concerned a reasonable diet, nutrition and behavior practical in puerperium for Chinese women. The questionnaire survey method was used to collect data for the two groups. The effect of intervention was evaluated. The nutritional health knowledge, puerperal dietary behavior during puerperium in two groups was compared.

1.3 Quality controll

Investigators and follow up staff were carried out by the unified training methods and standards. Participants volunteered to the trials to ensure that the investigation results of authenticity. Questionnaires had handed into the computer by staff. The error rate was less than 5%, throught database and the original questionnaire 100% check and timely error correction.

1.4 Analysis

Survey elicited information on unified coding, and EpiData 3.1 software was used to establish database. All statistical analysis were performed by using SPSS17.0 statistical software .Statistical methods are descriptive analysis, independent samples t test and chi-square test while $P<0.05$ for statistically testing standards without special note.

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2 Results

2.1 Basic situation

The age rang of participants was form 18 to 49 years, with the mean age of 28.22 ± 3.754 years in intervention group and 28.04 ± 4.076 years old in the control group.

There was no significant difference in the two groups for culture degrees that with college culture were respectively 53.5%, 43.5%. In addition, the two groups of objects spouses cultural degrees, family population, incomes had no significant difference before intervention.

2.2 Changes in nutritional health knowledge level

2.2.1 Knowledge about nutritional and health The awareness rate of nutrition and health knowledge was low in participants of two groups before education intervention. No significant differences were found between them. The understanding rate of the nutrition and health was significantly higher than before among the intervention group through education. Except two problems, of "Breast milk is the best food for infant , Bedroom should be ventilated everyday ", the remaining problem awareness rate were significantly higher than that of control group. Refer to table 1.

Table 1 The awareness rate of nutrition and health knowledge among two groups

Knowledge	Before intervention				After intervention			
	Intervention		Control		Intervention		Control	
	n	%	n	%	n	%	n	%
Chicken is more nutritious than chicken soup	37	17.4	38	18.4	168	78.9	40	19.3**
Women can eat vegetables during puerperium	205	96.2	199	96.1	210	98.6	192	92.8**
Women can eat fruit during puerperium	201	94.4	194	93.7	193	90.6	126	60.9**
Soybeans are sources of high quality protein	123	60.0	120	58.5	178	83.6	111	53.6**
Milk is sources of high quality protein	85	42.9	100	48.8	187	87.8	117	56.5**
Eggs are sources of high quality protein	97	55.7	129	63.2	191	89.7	138	66.7**
Which food is iron-rich	146	68.5	133	64.3	195	92.0	133	64.3**
Colostrums should feed the infant	142	66.7	140	67.6	199	93.4	161	77.8**
Breast milk is the best food for infant	205	96.2	199	96.1	210	99.1	203	98.1
Bedroom should be ventilated everyday	172	80.8	167	80.7	197	92.5	176	85.0
Relevant activity is better for recovery	160	75.1	156	75.4	193	90.6	191	92.3*
Sexual activity should not be initiated until 6 weeks after delivery	169	79.3	155	74.9	199	93.4	177	85.5*

Note: Chi-square test,*P<0.05,**P<0.01

2.2.2 The ways of obtaining knowledge There was no difference that the ways of obtaining nutritional and health knowledge between two groups before intervention. The rate from high to low was: books and magazines, friends and colleagues, parents, network, medical staff, parents, neighbors, relatives. After intervention, the ways had changed in intervention group subjects, which from high to low is the medical staff, books and magazines, parents, friends and colleagues, parents, relatives, neighbors, network. In the intervention group subjects, the incidence got knowledge of nutrition and health from medical staff, books and magazines (83.1%, 72.3%) were significant higher (P<0.01) than that of the control group of objects (65.2%, 56%) and no significant differences in other ways.

2.3 Mean daily intake of food

Significantly differences of mean daily intake of food were found between the two groups. Potato, fish, beans, leafy green vegetables and nuts intake in the intervention group was significantly higher than those in control group,egg intake was significantly lower than the control group, the difference was significant (P<0.05). Cereal, milk, poultry, crab, animal offal, animal blood, soybeans, other vegetables, fruit intakein the intervention group was higher than that of the control group, but no significant difference. Refer to table 2.

2.4 Energy and nutrient

During the puerperium, significantly higher average dietary fiber, niacin, calcium, vitamin C and significantly lower average cholesterol daily intake were found in the intervention group as compared to the control group, but intake of other nutrient had no significant difference between the two groups. Compared with recommended nutrient intakes (RNI) ,puerperium energy intake in the intervention group reached 84.31% of RNI while protein intake reached 154.72% of RNI [10]; Niacin, vitamin E and vitamin C intake was adequacy and other nutrients were still below the RNI . Energy intake in the control group during puerperal period reached to 82.35% of RNI and protein intake reached 138.80% of RNI; Except vitamin E , intake of other nutrients had different degrees of deficiency.(Table 3).

Table 2 Mean daily intake of food categories of the participants (g/d/person, mean± sd)

	Intervention	Control	t	P
Cereal	117.72± 42.26	113.41± 41.05	1.061	0.289
Potato*	105.87± 68.85	93.24± 60.36	1.997	0.046
Eggs*	111.34± 35.54	119.25± 38.99	2.174	0.030
Milk	145.07± 123.95	122.71± 124.50	1.845	0.066
Meat	103.99± 36.60	104.13± 34.85	0.039	0.969
Fish*	153.52± 76.47	135.68± 72.92	2.442	0.015
Poultry	159.39± 65.91	150.58± 79.38	1.239	0.216
Shrimps and crabs	70.19± 63.06	61.11± 71.37	1.382	0.168
Animal offal	37.21± 45.20	33.21± 40.16	0.956	0.340
Animal blood	26.06± 39.62	25.36± 39.68	0.179	0.858
Soya bean	28.87± 34.33	28.16± 32.88	0.218	0.827
Bean products**	125.35± 72.62	99.52± 79.59	3.477	0.001
Green leafy vegetables*	168.78± 100.81	150.48± 82.43	2.033	0.043
Other vegetables	150.23± 110.90	131.40± 92.45	1.888	0.060
Fruit fruit	149.93± 77.28	138.19± 90.98	1.427	0.154
Nut**	40.14± 41.73	22.71± 43.13	4.210	0.001

Note: Independent samples t-test ,*P<0.05，**P<0.01

Table 3 Average daily intakes of energy and nutrient

Energy and nutrient	Intervention		Control	
	Intake	Intake/RNI (%)	Intake	Intake/RNI (%)
Energy (kcal)	2192.90± 501.91	84.31	2141.43± 542.43	82.35
Protein (g)	131.156± 33.83	145.72	124.92± 40.02	138.80
Fat (g)	87.48± 23.21	-	86.74± 24.21	-
Dietary fibe (g)	14.11± 5.14	-	12.97± 5.48*	-
Carbohydrate (g)	208.20± 61.27	-	202.27± 67.30	-
Vitamin A (μg)	670.18± 250.35	55.85	712.80± 290.24	59.40
Vitamin B2 (mg)	1.62± 0.47	95.29	1.66± 0.54	97.59
Nicotinic acid (mg)	19.07± 6.3	105.94	16.12± 7.63**	89.55
Vitamin E (mg)	21.67± 7.01	154.78	20.36± 7.94	145.42
Sodium (mg)	1589.85± 484.61	72.27	1515.11± 533.67	68.87
Calcium (mg)	782.57± 294.87	65.21	679.21± 297.80**	56.60
Iron (mg)	23.79± 6.20	95.16	22.86± 6.97	91.44
Vitamin C (mg)	131.48± 76.00	101.14	110.87± 68.65**	85.28
Cholesterol (mg)	1494.70± 650.18	-	1717.78± 819.58**	-

Note: Independent samples t-test ,*P<0.05, **P<0.01

3 Discussion

3.1 Intervention was successful in improving participants' nutritional and health knowledge

From the result it can see that the level of nutrition and health knowledge in intervention group was significantly higher than that before education intervention and control group. The improvement was found in the knowledge of chicken was more nutritious than chicken soup, sources of high quality protein, which food was iron-rich, colostrums should feed the infant, relevant activity is better for recovery. The mission of intervention was focused on sources of calcium, iron, high-quality protein food and advocate health care proposals in puerperium. This proved that the intervention, targeted and user-friendly, can achieve good results. Mao LM in the intervention study have the same result[11]. The main ways of getting knowledge in the intervention group were changed, from books and friends and colleagues to medical personnel and books and magazines. The obvious changes also proved that the intervention play an important role in improving participants' nutritional and health knowledge .

3.2 Dietary and life behavior has improved markedly in the intervention group

Investigation showed that the diet structure in puerperium was unreasonable [12-16]. The main performances were excessive intake of eggs and too low intake of milk and fruit when "sitting month". The results showed the intervention group ingested eggs were significantly less than that in the control group. The consumption of vegetables, achieved the recommended nutrient intakes of balance diet pagoda of lactating women [17], significantly more than that in the control group. Because of vegetables are rich in dietary fiber and vitamin C, the intervention group object ingested dietary fiber and vitamin C were significantly higher than that of the control group, and vitamin C had reached to recommended nutrient intakes. Milk and beans were the food sources of calcium, calcium intake amount of the intervention group was significantly higher than that in control group. One of the priorities of intervention was attention increased intake of fruit ,vegetables, milk and soy and not excessive intake of fish ,eggs and meat. Therefore, targeted intervention play an important role in promoting dietary behavior change among the women in puerperium.

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营养保健知识宣教对妇女产褥期知识、行为干预效果研究*

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摘要 目的:评价营养保健知识宣教对妇女产褥期营养保健知识认知、饮食行为的效果。**方法:**选择青岛市孕晚期妇女作为研究对象,随机分为干预组和对照组,对干预组对象进行营养保健知识宣教。**结果:**干预组对象大部分营养保健知识的知晓率显著高于对照组,干预组对象从医务人员、书刊杂志获得营养保健知识的发生率(83.1%、72.3%)显著高于对照组对象(65.2%、56.0%);干预组对象薯类、鱼类、豆制品、绿叶蔬菜、坚果,膳食纤维、烟酸、钙、维生素C的每日摄入量显著高于对照组,蛋类,胆固醇的摄入量显著低于对照组。**结论:**针对性强的营养保健知识教育能明显提高产褥期妇女知识水平,促进健康的饮食行为,因此应推广有针对性的营养保健知识宣教。

关键词:产褥期;健康教育;宣教;干预

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