

Research Article**Studies of Relationships on Nutrition Knowledge, Nutrition Attitude, and Dietary Behaviors of Staff Nurses**Yueh-Hui Chen¹, Chao-Hsien Lee², Szu-Mei Hsiao³, Pi-Li Lin³, Chia-Chen Tseng³, Tsan Yang^{2*}¹Department of Nutrition, Cishan Hospital, Ministry of Health and Welfare, Taiwan²Department of Health Business Administration, Meiho University, Pingtung County, Taiwan³Department of Nursing, Meiho University, Pingtung County, Taiwan***Corresponding author**

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Abstract: The diet of many nurses does not conform to the recommended daily reference intake. Nurses tend to have numerous meals a day, frequently eat out, and do not exercise regularly; thus, they are likely to develop chronic diseases such as cardiovascular diseases and diabetes. This phenomenon, if being ignored, may have considerably negative effects on the nurses' health in the long term. This study targeted nurses in a regional hospital in Southern Taiwan and aimed to understand their nutrition knowledge, nutrition attitude, and current dietary behavior and to investigate the factors that influence their dietary behavior. This study conducted a cross-sectional survey of the nurses in a regional hospital in Southern Taiwan from December 1, 2014 to February 28, 2015; 207 valid samples were obtained. The questionnaire of "A Study of Nutrition Knowledge, Attitude to Dietary Behavior among In-Service Student Nurses" was used in the present study. The results indicated that participants attained medium scores for nutrition knowledge and low scores for nutrition attitude and dietary behavior. A stepwise regression analysis revealed a positive correlation between the nutrition attitude and dietary behavior in nurses who did not do shiftwork, who worked in nursing homes or intensive care units, and who regularly read health magazines. The aforementioned variables were significant predictors of dietary behavior ($p < 0.05$), explaining 46.6% of the total variance. In conclusion, the nurses' nutrition attitude influenced their adoption of healthy dietary behaviors. Thus, hospitals should focus on developing a positive health-oriented attitude among nurses when promoting healthy dietary habits in the workplace.

Keywords: Staff nurses, nutrition knowledge, nutrition attitude, dietary behaviors.

INTRODUCTION

A healthy lifestyle and proper dietary habits are seen as important methods to prevent chronic diseases and improve health [1]. One main factor leading to chronic diseases is a long-term unhealthy lifestyle [2]. One study has found that diets high in fat and animal proteins and low in fiber can cause oncogenic tumors [3]. According to a 2003 World Health Organization (WHO) report, low fruit and vegetable intake leads to the death of approximately 2.63 million people each year, chronic diseases accounted for 60% of the mortality rate and 49% of global expenditures for diseases, and the intake of fruits and vegetables can reduce the incidence of chronic diseases [4]. The American Institute for Cancer Research emphasizes that most cancers can be prevented by changes in diet, maintaining a healthy body weight, regular exercise, and not smoking. This illustrates the importance of a healthy lifestyle, changes in habits, and correct dietary behavior [5, 6].

Nurses play important roles in care and promoting public health [7]. The health of nurses is also closely correlated to the quality of public health care. The nature of nursing work entails round-the-clock shifts to care for patients, which, compared to most other professions, involves more family stress, less efficiency, less sleep, and frequent work accidents [8, 9]. Nursing work is also correlated with low satisfaction of personal physical and mental health (8). One study from Taiwan found that evening shift workers have a lower total calorie intake than those who work other shifts; these unbalanced diets include foods with high fat content and negatively impact health [10]. The diets of many staff nurses do not comply with the recommended daily intake and have a high probability for many meals per day and take-out foods. Staff nurses also often lack exercise which may lead to chronic diseases such as cardiovascular disease and diabetes.

Many workplace studies in Taiwan focus on the prevention of occupational injuries, while studies on the influence of worker nutrition knowledge and nutrition

attitude on dietary behavior are limited. Studies in this regard focusing on nurses are, thus, even more scarce. Therefore, this study surveyed the nurses in a regional hospital in Southern Taiwan to investigate the relationship between nutrition knowledge, nutrition attitude, and dietary behavior and analyze the predictors of dietary behavior.

METHODS

Study design and data collection

This study was a cross-sectional survey examining the relationship between nutrition knowledge, nutrition attitude, and dietary behavior of nurses in a regional hospital in Southern Taiwan. All participants in this study were female nurses. A total of 220 questionnaires were distributed between December 01, 2014 and February 28, 2015 and an effective sample of 207 questionnaires was collected.

Inclusion criteria included:

1. A valid certificate for a licensed practical nurse or registered nurse;

2. Professional registration;

3. Employment at a regional hospital.

Exclusion criteria included:

1. Age below 20 years;

2. No certificate for a licensed practical nurse or registered nurse.

Instrument

This study used a portion of the questionnaire from "A Study of Nutrition Knowledge, Attitude to Dietary Behavior among in-Service Student Nurses," including sections for demographic characteristics, nutrition knowledge, nutrition attitude, and dietary behavior [11]. Content included:

I. Questionnaire survey

1. Demographic characteristics: age, years of work experience, height, weight, level of education, marital status, number of children, department, perceived physical status, shift demands, smoking habits, drinking habits, exercise habits, participation in health lectures, reading of health magazines, source of nutritional information, type of diet, and frequent intake of liquid.

2. Nutrition knowledge, nutrition attitude, and dietary behavior questionnaire: 21 questions on nutrition knowledge and 16 questions on nutrition attitude: A five-point Likert scale from "strongly disagree" to "strongly agree" was used to score the questionnaires, with higher scores indicating better nutrition knowledge. 20 questions on dietary behavior: A five-point Likert scale from "never" to "always" was used to score the questionnaires, with higher scores indicating better dietary behavior.

II. Questionnaire validity

The content validity and factor analysis for the questionnaire from "A Study of Nutrition Knowledge, Attitude to Dietary Behavior among in-Service Student

Nurses" used in this study were found using principal components analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the 21 nutrition knowledge questions was 0.837. Three factors were obtained after varimax rotation; these were termed basic nutritional cognition (4 questions), nutrition and disease risk factor cognition (13 questions), and dietary fiber cognition (4 questions). The total explained variance was 49.83% and the Cronbach's α for internal consistency of nutritional knowledge was 0.78.

The KMO measure for the 16 nutrition attitude questions was 0.808. Four factors were obtained after varimax rotation; these were termed general intake attitude (4 questions), care for nutrition and health (4 questions), positive health-oriented attitude (4 questions), and attitude toward learning nutrition and choices of food (4 questions). The total explained variance was 54.3% and the Cronbach's α for internal consistency of nutritional attitude was 0.709.

The KMO measure for the 20 dietary behavior questions was 0.820. Four factors were obtained after varimax rotation; these were termed general intake behavior (6 questions), nutritional intake behavior (8 questions), food avoidance behavior (4 questions), and diet learning behavior (2 questions). The total explained variance was 56.18% and the Cronbach's α for internal consistency of dietary behavior was 0.831.

Statistical analysis

SPSS 18.0 software was used for descriptive and inferential statistical analysis. Percentage, mean \pm standard deviation, independent t test, one-way ANOVA, Pearson product-moment correlation, and multiple regression analysis were used to predict the relationships between participants' demographic characteristics, nutrition knowledge, nutrition attitude, and dietary behavior.

RESULTS

Table 1 shows that the scores for the 21 nutrition knowledge questions ranged 21-105 and the mean score was 81.89 ± 8.62 . The scores for the 16 nutrition attitude questions ranged 16-80 and the mean score was 51.85 ± 7.44 . The scores for the 20 dietary behavior questions ranged 20-100 and the mean score was 66.01 ± 9.33 . Higher scores indicated better nutrition knowledge, nutrition attitude, and dietary behavior.

The results of analysis of variance for nurses' nutrition knowledge, nutrition attitude, and dietary behavior with regard to demographic characteristics indicated that there was no significant difference between shift work and nutrition knowledge and nutrition attitude; however, nurses who did not do shift work had better dietary behavior than those who did. Nurses who exercised had better nutrition attitudes and dietary behavior than those who did not. Nurses who participated in health lectures, read health magazines

and vegetarian had better nutrition attitudes and dietary behavior than those who did not. The above results all reached statistical significance (Table 2).

Table 3 shows that there were significant differences in nutrition knowledge and nutrition attitude between different age groups, with nurses over the age of 51 having the highest and those under 20 having the lowest. Significant differences in nutrition knowledge were also found for years of work experience. Overall, those with 11 or more years of experience had better knowledge than those with 1 or less years of experience. Significant differences in nutrition attitude were found for nurses in different divisions. Scheffe's test found that other divisions (social work and home care) had better nutrition attitude than the emergency department.

Pearson's product-moment correlation was used to analyze the relationships between nurses' nutrition knowledge, nutrition attitude, and dietary behavior (Table 4). The results showed that there was no clear correlation between nutrition knowledge and nutrition attitude or dietary behavior; however, nutrition attitude and dietary behavior were positively correlated ($r=0.641$, $p<0.01$). This indicates that higher scores for nutrition attitude correlate to better dietary behavior.

In order to understand the predictors influencing nurses' dietary behavior, stepwise regression analysis was conducted where dietary behavior was held as the criterion variable and the variables which achieved statistical significance in ANOVA analysis were held as the predictor variables (Table 5). The results showed that nutrition attitude, shift demands, work in nursing homes or intensive care units, and reading of health magazines had an impact on dietary behavior. The explanatory power for this regression model was 46.6%. Specifically, the factors were nutrition attitude ($\beta=-0.168$, $P<0.001$), works in shifts ($\beta=-0.160$, $P<0.003$), works in nursing home ($\beta=0.137$, $P<0.009$), works in intensive care unit ($\beta=0.124$, $P<0.022$), and reads health magazines ($\beta=0.114$, $P<0.044$). All factors were significantly different ($p<0.05$). The coefficients show that for each one point increase in nurses' nutrition attitude, overall dietary behavior increased 0.774 points, those who worked in shifts had 3.098 points fewer for dietary behavior than those who did not work in shifts, those who worked in nursing homes or intensive care units had 7.583 and 3.186 more points, respectively, for dietary behavior than those who worked in the emergency department, and those who read health magazines had better dietary behavior than those who did not.

DISCUSSION

The objective of this study was to understand the relationship between nutrition knowledge, nutrition attitude, and dietary behavior with regards to nurses in a regional hospital in Southern Taiwan and to analyze the impact factors of dietary behavior.

The results indicated a significant difference in nutrition knowledge and nutrition attitude between nurses aged 51 or above and those aged 20 or below. However, there was no significant difference in dietary behavior. Nutrition knowledge and nutrition attitude improve as age increases; thus, as nurses age and accumulate clinical experience, they also develop a healthier lifestyle. This is similar to the results of past research [12]. As work experience increased (11 years or over), nurses' nutrition knowledge improved; however, there was no significant difference in nutrition attitude or dietary behavior. There was also no correlation between body mass index and nutrition knowledge, nutrition attitude, or dietary behavior. This is similar to the results of one study focusing on in-service student nurses [11]. The majority of participants in this study were college graduates; thus, there was no significant difference in nutrition knowledge, nutrition attitude, or dietary behavior in terms of level of education.

With regards to nurses' work divisions, this study found that while there was no significant difference in nutrition knowledge or dietary behavior, nurses in "other" divisions (such as social workers, home care workers, and customer service workers) had better nutrition attitude than those in the emergency department. One study on the influence factors of nurses' leisure coping strategies and healthy lifestyles found that nurses who provided independent care (such as case managers or experienced registered nurses) had more healthy diets than nurses who worked in emergency or critical care departments. While the study objectives and questionnaire content may differ, the results for dietary health in different nursing divisions were similar [13]. Possible factors may be that emergency department nurses have more work stress, longer work hours, and must handle urgent matters and thus have poorer nutrition attitude performance than nurses in other divisions. As there are few studies regarding the effect nursing divisions have on nurses' nutrition knowledge, nutrition attitude, and dietary behavior, future research can further investigate this issue.

Table1: The score distribution of nurses ‘nutrition knowledge, nutrition attitude, and dietary behavior

Variables (score range)	Lowest	Highest	Mean	S.D [#]
Nutrition knowledge (21~105)	40	102	81.89	8.62
Nutrition attitude (16~80)	33	76	51.85	7.44
Dietary behavior (20~100)	39	95	66.01	9.33

[#]S.D: standard deviation

Table-2: The analysis of the difference between the nurses ‘demographic characteristics and nutrition knowledge, nutrition attitude, and dietary behavior (N=207)

Variables	N	Nutrition knowledge				Nutrition attitude				Dietary behavior			
		Mean	S.D	t	p-value	Mean	S.D	t	p-value	Mean	S.D	t	p-value
Shift demands				0.187	0.852			-0.807	0.421			-2.476*	0.014
Yes	133	81.98	9.24			51.53	7.90			64.83	9.67		
No	74	81.74	7.43			52.41	6.56			68.14	8.31		
Smoking				-0.517	0.605			0.582	0.561			-0.126	0.900
Yes	3	79.33	15.04			54.33	4.04			65.33	8.50		
No	204	81.93	8.55			51.81	7.48			66.02	9.36		
Drinking				-0.889	0.375			0.411	0.682			-1.530	0.128
Yes	2	76.50	2.12			54.00	2.83			56.00	1.41		
No	205	81.95	8.64			51.82	7.47			66.11	9.32		
Exercise				0.862	0.390			4.407***	<0.001			3.446**	0.001
Yes	59	82.71	7.67			55.31	7.18			69.46	8.46		
No	148	81.57	8.97			50.47	7.11			64.64	9.33		
Participated in health lectures				1.318	0.189			3.833***	<0.001			2.751**	0.006
Yes	66	83.05	9.33			54.65	7.55			68.58	8.75		
No	141	81.35	8.25			50.53	7.04			64.81	9.38		
Read health magazines				1.441	0.151			5.860***	<0.001			5.005***	<0.001
Yes	128	82.57	7.69			54.05	7.23			68.42	8.97		
No	79	80.80	9.89			48.27	6.33			62.10	8.59		
Vegetarian				1.741	0.083			-2.024*	0.044			-2.295*	0.023
No	203	65.80	9.16			51.70	7.31			65.80	9.16		
Yes	4	76.50	13.28			59.25	11.35			76.50	13.28		

Note: Independent t-test was adopted. Significant difference $\alpha=0.05$; * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table-3: The one-way ANOVA analysis of the difference between the nurses 'demographic characteristics and nutrition knowledge, nutrition attitude, and dietary behavior (N=207)

Variables	N	Nutrition knowledge					Nutrition attitude					Dietary behavior				
		Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe
Age(years)				2.792*	0.027	(5)>(1)			2.680*	0.033	(5)>(1)			2.164	0.07	
≤20	3	79.33	3.51				48.67	9.45				69.00	15.59			
21~30	84	80.69	9.22				50.50	7.37				64.39	9.06			
31~40	95	81.79	7.96				52.24	7.38				66.46	9.28			
41~50	17	85.29	7.57				53.94	6.67				67.47	8.95			
≥51	8	89.50	8.90				58.00	6.72				73.38	8.57			
Work experience(years)				2.666*	0.034	(5)>(1)			1.274	0.282				1.250	0.291	
<1	3	79.33	3.51				48.67	9.45				63.00	13.75			
1~3	61	79.66	9.36				50.39	7.67				64.21	9.89			
4~5	25	80.76	8.63				52.16	6.54				66.1	5.95			
6~10	53	82.08	7.59				51.89	7.60				66.00	9.19			
≥11	65	84.40	8.36				53.20	7.28				67.80	9.68			

Note: One-way ANOVA with Scheffe test was adopted. Significant difference $\alpha=0.05$; * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table 3: The one-way ANOVA analysis of the difference between the nurses' demographic characteristics and nutrition knowledge, nutrition attitude, and dietary behavior (N=207) (cont.)

Variables	N	Nutrition knowledge					Nutrition attitude					Dietary behavior				
		Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe
Body mass index(Kg/m ²)				0.688	0.560				2.060	0.107				0.705	0.550	
①≤18.5	20	79.35	5.87				53.45	9.46				67.40	12.47			
②18.6~23.9	107	82.04	7.81				52.46	7.54				65.90	9.46			
③24~26.9	43	82.60	8.51				51.79	6.64				67.05	8.49			
④≥27	37	82.03	11.77				49.27	6.46				64.38	7.92			
Educational level				0.459	0.711				0.678	0.566				1.550	0.203	
①High school	4	78.00	6.38				54.25	12.34				69.25	20.19			
②Junior college	61	81.41	9.70				51.28	7.21				64.08	8.99			
③College	139	82.17	8.26				51.92	7.36				66.65	9.02			
④Graduate school	3	84.33	3.21				56.67	11.06				71.00	10.58			

Note: One-way ANOVA with Scheffe test was adopted. Significant difference $\alpha=0.05$; * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table-3: The one-way ANOVA analysis of the difference between the nurses' demographic characteristics and nutrition knowledge, nutrition attitude, and dietary behavior (N=207) (cont.)

Variables	N	Nutrition knowledge					Nutrition attitude					Dietary behavior				
		Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe
Marital status				0.247	0.781				0.740	0.478				0.477	0.622	
①Single	111	81.54	8.85				51.28	7.66				65.59	9.60			
②Marriage	86	82.21	7.88				52.42	7.37				66.28	9.18			
③Divorced	10	83.10	12.31				53.20	5.27				68.40	7.71			
Number of children				1.349	0.260				2.474	0.063				1.232	0.299	
① 0	122	81.77	9.07				51.34	7.73				65.62	9.38			
② 1	29	80.28	8.10				50.21	7.60				65.72	10.12			
③ 2	47	82.06	7.60				54.32	6.12				67.91	8.64			
④ ≥3	9	87.89	7.46				51.00	7.45				62.22	9.05			

Note: One-way ANOVA with Scheffe test was adopted. Significant difference $\alpha=0.05$; * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table-3: The one-way ANOVA analysis of the difference between the nurses' demographic characteristics and nutrition knowledge, nutrition attitude, and dietary behavior (N=207) (cont.)

Variables	N	Nutrition knowledge					Nutrition attitude					Dietary behavior				
		Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe
Department				1.847	0.062				2.121*	0.029	⑩>③			1.001	0.440	
①Out patient	26	83.00	6.92				53.35	7.86				68.19	9.81			
②Ward	60	83.88	9.49				52.18	6.47				66.03	8.70			
③Emergency	7	75.57	5.65				46.57	6.95				62.00	8.62			
④Operating room	25	84.36	7.72				53.44	8.48				66.24	11.53			
⑤ICU	32	78.72	9.27				49.72	7.51				65.75	10.05			
⑥Dialysis room	9	81.56	6.19				50.00	4.77				67.56	7.13			
⑦Psychiatric	24	80.96	7.77				50.54	6.48				62.46	8.93			
⑧Nursing home	6	82.67	6.31				47.50	10.69				68.67	8.76			
⑨RCW	8	77.88	5.11				56.00	5.48				64.50	6.52			
⑩Others	10	80.80	11.72				56.50	8.80				70.00	8.01			

Note: One-way ANOVA with Scheffe test was adopted. Significant difference $\alpha=0.05$; * $p<0.05$ ** $p<0.01$ *** $p<0.001$

ICU: Intensive Care Unit; RCW: Respiratory Care Ward

Table 3: The one-way ANOVA analysis of the difference between the nurses' demographic characteristics and nutrition knowledge, nutrition attitude, and dietary behavior (N=207) (cont.)

Variables	N	Nutrition knowledge					Nutrition attitude					Dietary behavior				
		Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe	Mean	S.D	F	p-value	Scheffe
Physical status				2.127	0.079				1.485	0.208				0.665	0.617	
①Very good	14	81.29	12.96				55.29	8.34				67.57	9.69			
②Good	66	82.50	7.05				52.44	7.98				67.26	10.19			
③Average	114	81.73	7.75				51.40	7.08				65.13	8.82			
④Poor	11	78.09	15.64				48.64	5.71				66.00	7.97			
⑤Very poor	2	96.50	6.36				51.00	7.07				64.00	16.97			
Source of health concept				1.990	0.097				1.189	0.317				1.048	0.383	
①Newspaper	23	83.22	7.65				52.30	6.66				66.83	9.17			
②TV	68	80.81	8.94				50.76	6.00				65.18	8.60			
③Network	86	83.16	7.93				51.80	8.54				65.52	9.84			
④Magazine	17	81.82	7.02				54.94	6.39				70.00	9.81			
⑤Others	13	76.92	12.69				52.92	8.67				66.92	9.06			

Note: One-way ANOVA with Scheffe test was adopted. Significant difference $\alpha=0.05$; * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 4: The correlation analysis between nutrition knowledge, nutrition attitude, and dietary behavior

Variables	Nutrition knowledge	Nutrition attitude	Dietary behavior
Nutrition knowledge	1		
Nutrition attitude	0.133	1	
Dietary behavior	0.118	0.641**	1

Note: ** $p < 0.01$

Table-5: Multiple linear regression analysis of the predictive factors for dietary behavior

	Unstandardized coefficient Estimation of β	Standardized coefficient β distributions	p-value	VIF	F	R ²
(constant)	25.804		<0.001		35.088	0.466
Nutrition attitude	0.774	0.618	<0.001	1.183		
Shift demands	-3.098	-0.160	<0.003	1.042		
Nursing home	7.583	0.137	<0.009	1.025		
ICU	3.186	0.124	<0.022	1.081		
Read health magazines	2.187	0.114	<0.044	1.196		

Note:

1. Dependent variable: Dietary behavior
2. Shift demands (yes vs. no); Nursing home vs. Emergency; ICU vs. Emergency; Read health magazines (yes vs. no)

It is common for nurses to work in shifts and shift work influences dietary behavior; this study found that nurses who did not work in shifts had better dietary behavior than those who did. One study on the sleep and dietary patterns of nurses who work different shifts concluded that nurses who worked evening and night shifts had lack of calorie intake and the three macronutrients than those who worked the day shift or changed shifts [10]. This is similar to the results of this study. The majority of participants in this study were clinical nurses who worked different shifts; as clinical work is hectic and meal times may vary, their work performance may be poorer than nurses who do not change shifts.

This study found no significant difference between exercise habits and nutrition knowledge; however, there were significantly higher scores for nutrition attitude and dietary behavior. Chang and Hu (2006) reported that students who exercised regularly had better dietary behavior scores [14]. Another study on an eight-week aerobic exercise class for healthy weight control found that weight control knowledge, attitude, and dietary behavior scores all increased markedly [15].

This study found no significant difference between participation in health lectures and nutrition knowledge; however, there nutrition attitude and dietary behavior significantly improved. A study on an adult fat intake reduction nutrition education program concluded that the participant scores for nutrition knowledge, nutrition attitude, dietary behavior, and self-efficacy all improved. It can be inferred that courses on reducing fat intake can improve adults' nutrition knowledge, nutrition attitude, and self-efficacy, thus changing their dietary behavior [16]. This is similar to the results of this study. Analysis indicated that there was no significant correlation between nutrition knowledge and nutrition attitude or dietary behavior; however, nutrition attitude and dietary behavior were positively correlated

($r=0.614$, $p<0.01$). This was similar to the results found by Shepherd and Stockley (1987) [17].

Although this study found no correlation between nutrition knowledge and dietary behavior, higher nutrition knowledge scores also lead to higher dietary behavior scores. Nutrition attitude and dietary behavior were significantly correlated. Past studies also showed that nutrition knowledge did not improve healthy dietary behavior [18,19]. Beydoun and Wang (2008) surveyed American adults between the ages of 20 and 65 and concluded that nutrition knowledge only had a limited influence on dietary behavior [20]. Worsley (2002) claimed that it is necessary to improve nutrition knowledge in order to change dietary behavior and that dietary behavior modification must consider factors, such as environment and personal factors (motivation to change), other than nutrition knowledge [21].

Analysis of impact factors of dietary behavior indicated that nutrition attitude, shift demands, work in nursing homes or intensive care units, and reading of health magazines were statistically significant. Previous studies have also had similar conclusions [22, 23].

This study focused on 207 nurses at a regional hospital in Southern Taiwan selected by purposive sampling; the results of this study may be difficult to be generalized due to differences in individual or regional characteristics. As this was a cross-sectional study, inferences regarding the causal relationship between nutrition knowledge, nutrition attitude, and dietary behavior results may also be limited. Therefore, future researchers can conduct longitudinal studies to elucidate the changes that take place in healthy dietary lifestyles during each phase of a developing career. Future studies can also include other cities and medical centers to compare locations. Incorporation of other medical personnel, such as physicians, laboratory specialists, radiological technicians, and

rehabilitation specialists, can also elucidate the relationships between nutrition knowledge, nutrition attitude, and dietary behavior among medical professionals.

CONCLUSION

The nutrition knowledge scores in this study were mid-ranged (81.89 ± 8.62) and the nutrition attitude and dietary behavior scores were lower (51.85 ± 7.44 and 66.01 ± 9.33 , respectively). Exercise, participation in health lectures, reading of health magazines, and type of diet, all showed significant differences with nutrition attitude. Shift work, exercise, participation in health lectures, reading of health magazines, and type of diet all showed significant differences with dietary behavior. Nurses aged 51 or above had better nutrition knowledge than those aged 20 or below. Nurses with 11 or more years of experience also had better nutrition knowledge than those with 1 or less years of experience. Nurses aged 51 or above had better nutrition attitude than those aged 20 or below and nurses in "other" divisions (such as social workers and home care workers) had better nutrition attitude than those in the emergency department. Nutrition attitude and dietary behavior were positively correlated. Nutrition attitude was the influencing factor of dietary behavior with the greatest explanatory power.

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