NURSES WORKING IN INTERNAL MEDICINE WARDS KNOWLEDGE AND PRACTICE RELATED TO FOOD-DRUG INTERACTION

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ABSTRACT

Aim of this study is to determine nurses' knowledge and practice about food-drug interaction. This study was a descriptive and cross section. The target population included 90 nurses who works in clinics of internal diseases in two university hospitals in Ankara. The survey was conducted using questionnaire form developed in light of related literature by researcher. Data were entered and evaluated into the SPSS. 32.2% 26.7%, 24.4 % of the nurses had knowledge about effects of alcohol, calcium, grapefruit respectively. In regard to effects of drugs on minerals and vitamins in organism, 37.8% and 7.8% of the nurses had knowledge about effects of anticoagulans and antidiabetics, respectively. The status of nurses' knowledge according to subgroups by age, educational level and working years was assessed. As a result of the analyses no significant differences were found. 12.2% of the nurses expressed that content of nutrition was adjusted by nurses because of food drug interactions. Lesson of food-drug interaction should be put in curriculum of nursing education and topic of food-drug interaction should be firmed by job training. Thus effects of treatment and quality of care could increase.

Key Words: Drug Therapy Management, Health Care, Nursing Care, Food-Drug Interaction

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İÇ HASTALIKLARI SERVİSİNDE ÇALIŞAN HEMŞİRELERİN BESİN İLAÇ ETKİLEŞİMİ İLE İLGİLİ BİLGİ VE UYGULAMALARI

ÖZET

Bu çalışmanın amacı, hemşirelerin besin ilaç ile ilgili bilgi ve uygulamalarını belirlemektir. Bu çalışma tanımlayıcı ve kesitseldir. Ankara' da iki üniversite hastanesi iç hastalıkları kliniklerinde çalışan 90 hemşire çalışmanın örneklemidir. Araştırmada araştırmacılar tarafından literatüre dayanılarak geliştirilen anket formu kullanılmıştır. Veriler SPSS'e girilmiş ve değerlendirilmiştir**.** Hemşirelerin sırasıyla %32.2, %26.7, %24.4'ünün, alkol, kalsiyum ve greyfurtun etkisi ile ilgili bilgisi vardır. İlaçların mineral ve vitaminler üzerindeki etkisi dikkate alındığında, sırasıyla %37.8ve %7.8'i antikoagülan ve antidiyabetiklerle ilgili bilgisi vardır. Hemşirelerin bilgisi, yaş, eğitim durumu ve çalışma yılı gibi alt gruplara gore değerlendirilmiştir. Analiz sonucunda istatistiksel açıdan anlam çıkmamıştır. Hemşirelerin %12.2'si besin ilaç etkileşimi nedeniyle hemşireler tarfından besin içeriğinin ayarlandığını vurgulamıştır. Hemşirelik eğitiminde besin ilaç etkileşimi derslerinin müfredata konmalı ve hizmet içi eğitimde besin ilaç etkileşimi konusuna yer verilmelidir. Böylece tedavinin etkinliği ve bakımın kalitesi artabilecektir.

Anahtar Kelimeler: İlaç Tedavi Yönetimi, Sağlık Bakımı, Hemşirelik Bakımı, Besin İlaç Etkileşimi

INTRODUCTION

Nutrition/food-drug interaction is among the important factor which determines the quality of treatment and care. It is necessary to pay attention not only the dosage and frequency of drugs which must be used in the treatment but also the nutrient elements and amounts during the treatment. Because drugs can change metabolism of nutrients just as the nutrients which is taken can affect pharmacodynamics and pharmacokinetics of drugs. Nutrients and drug interaction can be positive or negative (1-3).

It is known that drug treatment, alimentation and nursing care affect directly the healing process and quality of life. Health professional who implement drug treatment is nurse. Nurses are responsible for controlling efficiency of treatment and evaluating the results. At the same time, nurses should also take into consideration that alimentation is one of the effects that increases or reduces the efficiency of drugs even causes toxicty. Nurses should follow closely nutritional status as they implement and evaluate the drug treatment. Nurses should know the interaction between drug treatment and alimentation for conducting them effectively and they should assume the key role with their implementation.

As result of literature search, is has not been found data and studies of nurses'information and implementation about the nutrient-drug interaction in Turkey. By considering the shortage of information about this subject, it is thought to contribute the augmentation of care quality with the information and implementation of nurses' about nutrient-drug interaction, developed proposals in accordance with the results (4-9).

Research is planned as the descriptive and cross-sectional for determining the nurses'- who work in the clinic of internal medicine- knowledge and implementation about food-drug interaction.

MATERIAL AND METHOD

Working Group

Research was conducted between 28.07.2008-31.08.2008 with 90 (%72) nurses who accept to involve in research and work in the clinics of internal medicine in two universities in Ankara. All the nurses are involved to research who work in the clinics. If the choice of hospital, it is considered that the patients who apply for internal medecine form the majority in comparison with the other hospitals.

Questıonnaire And Evaluation

Data is collected with the questionnaire which created by researchers as a result of literature research. It is constituted two parts in the questionnaire. The 11 questions constituted the first part and they are made for determining the sociodemographic (age, period of employment, education etc) and food-drug interaction of nurses. The second part consists of the information and implementation parts which is made for determining the effects of nutrients to drugs and the effects of drugs to the vitamins and minerals that are in organism. While preparing the questionnaire, it is considered drug groups which are used usually in internal medicine clinics. It is wanted from nurse to mark nutrient groups which the nurses think them to influence each other and consist of drugs and nutrients. And also it is wanted to make an explanation in the blanks. In the evaluation of data, it is accepted ones who knows interacting drug with the food/diet content -consumption level- are accepted as "have knowledge" and ones who knows of the fact that of this medicines affectiveness on the vitamin and mineral levels of the organism are accepted as "have knowledge". It is food drug interraction are shown below:

Food/Diet Content -Drug

Including calsium foods / diet: Iron preparations and tetracycline

Including sodium foods / diet: Antimanic (Lithium)

Including iron foods / diet: Tetracycline

Including protein foods / diet: Levadopa

Including alcohol diet: Antineoblastic, tetracycline, antimanic (Lithium)

Herbal Teas: Antineoblastic

Including grapefruit juice diet: Antihypertensive(calcium channel blockers), antineoblastic

Drugs And Vitamins/Minerals

Antacid: Vitamins A and B, folic acid, calcium, iron, zinc, phosphate and magnesium.

Antilipidemic: Vitamins A, B, D, E and K, folic acid and iron.

Antibacterial: Vitamins A, B and C, calcium, iron, copper, zinc, sodium, potassium, phosphate and magnesium.

Anticoagulants: Vitamin K.

Laxative: Vitamins A, D, E and K, calcium, sodium, potassium and phosphate.

Diuretics: calcium, zinc, sodium, potassium and magnesium.

Antidiabetic: Vitamin B.

Steroid: Vitamin C, calcium, sodium and potassium.

Antineoblastic: Vitamin B, folic acid, calcium, potassium, phosphate and magnesium.

Antihypertensive: Vitamin B, sodium.

Analgesics (narcotics out):calcium, iron.

Anti-inflammatory: Folic acid, calcium, zinc and potassium.

Bronchodilator: Vitamin B.

Anticonvulsant: Vitamins D and K, folic acid and calcium

Antiparkinsonian: Iron

Antidepressant: Copper and sodium

Implemantation Of The Question Form

Pre-implementation survey forms have been conducted with 10 nurses and these have been kept outside research extent. After pre-application, necessary changes have been made on form. The meeting have been arranged in data collection period, lasted average of 45 minutes with responsible nurses for clinic. In meeting have been emphasized importance of working with responsible nurses and survey form has been introduced. Each responsible nurse at the same time has carried out survey forms in her own clinic.

Analysis Of Data

The data have been evalueted in statistical package program and in evaluation the frequency, distribution, and chi-square tests have been used. The written acceptance has been taken from the institutions in which the study was conducted and The nurses, who agreed to participate in the study, have been informed consent.

RESULTS AND DISCUSSION

%53.3 of nurses are between the age of 22-29 (30.2 ± 0.58; 22-45) (p=0,120) and %48.9 of nurses graduated from university. It is stated that total period of employment of the nurses' with the percentage %48.2 is about 2-5 (9.2 ± 0.75; 1-28) (p=0,088) years and %46.7 of period of employment in the internal medicine clinic is about 2-5 years (7.3 ± 0.71; 1-28). By this research, it is stated that %10 of nurses who involved this research attended class which is about food-drug intereaction and %5.6 of them in-service training for food-drug interaction.

The knowledge of the nurses, who work in internal medicine clinic, about effects of the nutrition/diet contents on medicines is analysed. With the analyses of the **data**, it is stated that the %32.2 of the nurses know of the effects of the alcohol, %26.7 of them know of the

effects of the calcium %24.4 of them know of the effects of the grapefruit juice, %23.3 know of the effects of the herbal tea, %16.7 know of the effects of the iron,%15.6 of them know of the effects of the protein and %10 of them know of the effects of the sodium on importance of the using medicines (Table-1).

When the nurses' knowledge about the affectiveness of the drugs on vitamin and mineral level at the organism are analysed; it is stated that the %37.8 of the nurses know the effects of the anticoagulant, %7.8 of them know the effects of antidiabetics, %2.2 of them know the effects of bronchodilator and antiparkinsonian,%1.1 of them know the effects of antihypertensive, antibacterial, laxative, and steroids (Table-1).

Because anticoagulants as one of the most used medicines by the nurses, and the is the most knowledge (Table-1) on nutrition interaction of anticoagulants compared to the other ones; In table 2, it is assesmented of the relation between the nurses' knowledge on the anticoagulants and the age, total period of employment and the education levels are analysed. According having knowledge of drug-nutrition, age (p=0,120), period of employment (p=0,088) and the education levels (p=0,323) there isn't significant difference (p>0,05) (Table-2).

When evaluating the implantation of nurses about food-drug interaction,%33.3 of nurses indicated that they gave an education about nutrient-drug interaction and when evaluating the content of their education, it is stated that iron-calcium interaction was in the first place with percentage of %60. 12.2% of nurses expressed they controlled and arranged nutrition content of considering using drugs and in case need they worked dietetics together. %3.3 of nurses stated that they monitored the level of blood-potassium in who used diuretic and laxative and %2.2 of them monitored the level of blood-sodium and according with that, they arranged the content of nutrient (Table-3).

Table 1. Situation Knowing of Nurses About Effects of Food/Nutrition Content on Drugs and of Drugs on Vitamins/Minerals in Organism

Food/Nutrition Content	**Frequency**	**%**
Alcohol*	29	32.2
Calcium*	24	26.7
Grapefruit Juice *	22	24.4
Herbal Tea*	21	23.3
Iron*	15	16.7
Protein*	14	15.6
Sodium*	9	10.0
Drugs		
Anticoagulant*	34	37.8
Antidiabetic*	7	7.8
Bronchodilator *	2	2.2
Antiparkinsonian *	2	2.2
Antihypertensive *	1	1.1
Antibacterial *	1	1.1
Laxative *	1	1.1
Steroid*	1	1.1
Other**	0	-

*n folded

**Antiacid, antilipidemic, antidiüretic, antineoblastic, analgesic, anti-inflammatory, anticonvulsant, antidepressan

Table 2. Sociodemographic Features According to Know Interactions Anticoagulant Drug-Food/Nutrition

Socio-demographic Features		Knowledge Sitituon Interactions Anticoagulant Drug-Food/Nutrition				Test Result
		Have Knowledge		**No Knowledge**		
		Frequency	**%**	**Frequency**	**%**	
Age	22-29	14	41.2	34	60.7	**X²: 4,239** **p: 0,120**
	30-39	17	50.0	16	28.6	
	40-45	3	8.8	6	10.7	
Period of employment (year)	0-1	0	-	3	5.4	**X²: 6,546** **p: 0,088**
	2-5	10	29.4	27	48.2	
	6-10	10	29.4	8	14.3	
	11 and above	14	41.2	18	32.1	
Education	High School	8	23.5	7	12.5	**X²: 2,258** **p: 0,323**
	2 year at university	11	32.4	17	30.4	
	Graduated University	15	44.1	32	57.1	
Total		**34**	**100.0**	**56**	**100.0**	

Table 3. Nurses' Implemantations on Food/Nutrition Drug Interactions

Implemantations		**Sayı**	**%**
Arranging nutrition content of considering using drugs	**n:90**	11	12.2
Monitoring the level of blood-potassium used diuretic and laxative	**n:90**	3	3.3
Monitoring the level of blood-sodium used diuretic and laxative	**n:90**	2	2.2
Giving education/instruction about food-drug interaction	**n:90**	30	33.3
Education/instruction Subjects	**n:30**		
• Iron-calcium interaction *		18	60.0
• Antihypertansive drug and food interactions*		4	13.3
• Anticoagulant drug and food interactions *		4	13.3
• Grapefruit Juice and food interactions *		4	13.3
• Steroid and food interactions *		4	13.3

*n folded

With this study it has been determined a small percentage of nurses have knowledge about effect of nutrient/diet content on important drugs (Table-1). Especially containing calcium, iron, protein foods, herbal teas, grapefruit juice and such as alcohol drinks groups are known to effect the pharmacokinetics of the drug. In our study it has been most known the alcohol have an effect on drug (Table-1). Alcohol, by making pyloric spasm, with etinol microsomal oxidizing system activation, affect adversely effect of drug absorption and metabolism of many drugs. Using drug with alcohol consumption to can cause increase and decrease of drug effects to undesirable levels and intoxications. Especially the central nervous system depressants, antineoblastic and antibiotic drugs are from drug groups that interact with alcohol. In order to the effectiveness of the treatment, it's vital that the nurses should know alcohol-drug interaction and should also gather information about the alcohol habit of the patient and should plan the nursing process. When faced with the situations like alcoholism,

the nurse should direct the patient to the appropriate advice and guidance emergency, taking into the consideration of alcohol and drug interactions (10,11).

Calcium and irons can effect negatively drug emmision, especially by forming selation with the tetracycling group antibiotics; proteins can effect negatively attachment and distribution by interreacting with levadopa. Because the sodium level in organism is important for the ones who takes lithium, sodium taking should controlling. Because of being Narinjin and CYP3A4 enzyme inhibitor in grapefruit juice, inperiod of drug therapy, grapefruit juice consumption affects negatively on drug metabolism. Especially some drugs are metabolized with CYP3A4 enzyme. Consequently, when the nurses' knowledge of drugs' effects on vitamins and minerals in organism is analysed, very few of them (%10-32,2) have knowledge about this.

In our research, anticoagulant drugs' intereaction with the vitamins and minerals are pointed out with the most proportion (%26.7) (Table-1). Knowing the effect of the commonly used drugs in internal disease clinics like antihypertensives, laxatives, steroids bronchodilators, antiparkinsonians, antidiabetics and anticoagulants, monitoring these, giving care including nutrition education and informing the patients and care giver may enhance the effectiveness of the treatment (1-3,7,8,10-14).

With the literature research, the studies which the knowledge of nurses' about food drug interactions can not be found so the studies which the knowledge of nurses' compare with sociodemographic features can not be shown. But in other studies that determine the nurses' knowledge about other subject, there is no significant differences between knowledge situation and sociodemographic datas. In the study that was made by Mortel, it is examined informations and implementation of health workers about hepatisis C. At the end of this study, there is no statistically differences between knowledge situation and sociodemographic features (15). And in the other study that made by Soh and his friends, they examine knowledge of intesive care nurses about infections in hospital. With this, it is found not difference as statistically the sociodemographic features such as educational status and period of employment (16). Similar with the other studies, in this study any significant difference can not be found, it is clearly demonstrated that socio-demographic data (Table-2) like age, educational status and period of employment does not affect knowledge situation of the sociodemographic features.

When analyzing the applications about food-drug interaction, it is found that a great number of nurses give information to inpatient about the topic, small proportion of the nurses control nutrition considering the using drugs and if it is necessary they make the arrengement (Table-3) It is found that still a very small proportion on nurses follow the changes of serum electrolyte changes. Among the drug groups which can make liqiud electrolyte changes, laxatives, diuretics, steroids and from antimanic drugs lithium can be mentioned. For example nurses must know to follow the sodium level of patient who use lithium and nurses must plan their care from this direction. Among nurses' drug implementation, it can be mentioned such as arranging of food and drug hours, supplying patients to take vitamin C besides iron preparat, impeding the patients, who use drugs, from the grapefruit juice and alcohol consumption (within the institution or outside from institution after discharge), informing to discharged patients or relative of them about the drug intereaction and its importance. At the end of the research, none of the nurses mention about these interference. The main cause of this situation is lack of knowledge that nurses have. So it is expected that they don't undertake the interferences about the drugs. Nurses must take into consideration food drug interaction when being educated about drugs which they are using or they will use. It is nurses' responsibility to pursue the drug implementation of hospitalized patient. Nurses decide and implement usually the drug time/hours. Drugs and nutrient groups should be considered to be in different time zones to prevent negatively interactions. For example if the patient takes iron preparat, it must required at least two hours betwwen foods and beverages contain calcium. It must cease foods and beverages, which has long effects to human body like especially grapefruit juice, when using intereacted drugs. In intereaction, not only the time but also nutritional content is important. Nutritional content must be arranged according to drug groups which are used by the nurse. It must be known well implementation method of drugs, which may be interact, in patient who takes support of total parenteral and enteral alimentation and it must be considered of these methods.

As described above it is important that nurses must know and implement food-drug intereaction for the effectiveness of the treatment. Thus nurses, who know intereaction, can inform patients and can be guide to home care which is the important piece of treatments (2,3,6,9,13,14). But it is observed that is is not given enough importance to food-drug intereaction in the education and implementation which is given by the nurse to the both

hospitalized and non-hospitalized patient. The cause of this is considered that nurses' information about food-drug intereaction is not enough.

Pascoe and his friends decided the education range which is required by discussing with nurses. At the end of the research, %75.1 of nurses pointed that there is an education requirements about drugs, their effetcs and their implementations (17). In this study, few of the nurses expressed that they gave instructions about food drug interaction (Table-3). When explicating content of the information which is about food-drug intereaction that given by the nurse to the patient, it is observed that most of these informations are just about iron-calcium intereaction. As the cause of very few of the nurses, being aware of the food-drug intereaction and also calcium-iron intereactions' only majority in the content of training; it is likely to be for giving inadequate importance both in professional and in in-service trainings, and inadequate apprehending of the subject by nurses, moreover the results point that out. When the results of the research are analysed, it is stated that some of the nurses know the alcohol-drug intereaction but they don't educate to patient on the subject. Moreover, while the percentage of knowledge about the calcium and iron interaction is about %24, the education percentage on this subject is only %20. While these percentages on food-anticoagulan interaction is %34 and %4.4, for grapefruit juice-drug interaction, it is only %22 and %4.4.It is only %1.1 and %4.4 for antihypertensive drugs and stereoid drugs food interaction (Table 1 and 3). These results show that very few of the nurses have knowledge on this subject and fewer of them educate to patient this subject. As shown, it has been stated that very few of the nurses are educating on antihypertensive and steroid drug-food interaction, without the required knowledge. This shows us that there is a wrong or inadequate training about the subject and also makes us think that the treatment process may be effected negatively. With this research, it has been stated that very few of the nurses was educated in school and in-service training. In this case, both on professional training and on in-service training, it is highly recommended to give great importance on the food-drug interaction subject. Starting from the professional training of the nurse, also on in-service trainings, educating nurses on food drug interaction may provide a better apprehending of the importance of the subject and thus may encourage them to put food drug interaction in the information, given to the patient. Handling the food drug interaction subject both on professional and on in-service trainings at the same time will support nurses to develop themselves on this subject.

In conclusion of search, few of the nurses have knowledge about interactions of food drug and taking into consideration food drug interaction, following the nutritional status has been stated. Nurses having been informed about drug interactions is first step for giving care their patients. With knowing interactions of food drug by nurse, adjustment of drug and feeding times, providing exact and fully nursing care which includes disciplines such as nutrition content and quantity monitoring may enhance the effectivity of treatment. Therefore, in nursing education, at the undergraduate level, putting food drug interaction course in curriculum will especially be critically helpful in Turkey. In addition, in-service trainings by including up to date drugs on regular basis, educating this subject supports the nurse to renew his-her knowledge. The protocol is preparated about food and drug interactions by nursing services administration frequently confronted in service training, and putting this protocol in every room of the clinic will be reninding for nurses. Moreover, by apprehending the importance of food drug interaction in terms of effectiveness of treatment and care, nurses must support their development with up to date publication.

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