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Evaluation of nursing students' diagnoses using the Omaha System

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ABSTRACT

Objective: Nursing process guides the students in the diagnosing, planning, intervention and evaluation of patients/families, and it also gives a systematic point of view. The Omaha System is used as a nursing classification system in public health nursing course practice areas. It was conducted in order to examine the nursing diagnoses identified by the students according to the Omaha System.

Method: It was a retrospective, analytical research. Practice files of 51 students who took the public health nursing course created the sample.

Results: According to the Omaha problem classification list (PCL), the students in the study identified a total of 412 problems. According to Omaha PCL, the students mostly used the area of health behavior, followed by the physiological, psychosocial and environmental areas respectively. It was determined that 73% of the students had sufficient skills to use the Omaha System and 26.8% of them were inadequate.

Conclusion: It was observed that the nursing diagnoses identified by the students in line with the determined learning targets were sufficient.

Keywords: Education, Omaha System, evaluation, public health nursing

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Nursing process guides the students in the diagnosis, planning, intervention and evaluation of patients, and it also gives a systematic point of view [1, 2]. In a study by Erdoğan and Esin [3], which measured the efficacy of the Omaha System, a total of 1,783 nursing interventions were presented and defined. Results of this study revealed a high reliability, and the Omaha System was reported to be useful in defining public health nursing practices [3].

In our country, most of the undergraduate nursing schools offer nursing courses and training according to the specific type of nursing practice required. For example, in clinical practice, the NANDA Nursing Diagnoses Classification is usually used, while within the public health practice the Omaha System is used for planning home visits [3, 4]. Nevertheless, students can be expected to experience to difficulties in the nursing process as they attempt to apply what they have learned during classroom lectures.

The Omaha System was developed by the Visiting Nurse Association of Omaha, Nebraska in 1975 in the United States and was approved by the American Nursing Association (ANA) in 1992 [5]. The Omaha System has been actively used in Turkey since 1999 in nursing degree programs and public health nursing education. Both educators and students have found

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this system very useful for developing students information management skills [2]. The Omaha System outlines the terms and codes which define health and which range from the general to the specific. The taxonomy of the system is arranged for use by nurses as well as professionals in other disciplines. The model is composed of the Problem Classification Scheme (PCS), the Problem Rating Scale (PRS), and the Nursing Intervention Scheme (NIS), all of which are compatible with each other [6, 7]. The PCS consists of four domains: environmental, psychosocial, physiological, and health behaviors. These contain 42 past, existing, or probable health problems and nursing diagnoses of family and community. An implemented intervention also has four domains: the problem, category, target, and definition of care. These encompass education, guidance and counseling, treatment procedures, case management and surveillance. The results and progressions obtained at the end of nursing interventions are evaluated with the PRS. With this scale, the acquired information, behavior, and status are evaluated with a minimum score of 1 and a maximum score of 5. The use of the PRS with the other two components of the Omaha System creates a comprehensive problem solving model for education, application and research [7, 8].

A review of the literature showed studies which used the Omaha System in occupational health nursing, school health nursing, nursing homes and some clinical fields [6, 9-14]. These studies focused specifically on the use of the Omaha System. As noted earlier, this classification system is used in the public health nursing courses in our country. Although it differs from the nursing process that students learn for three years and from the North American Nursing Diagnosis Association (NANDA) nursing diagnosing list, no studies have reported any difficulties in using the Omaha System in undergraduate education. This study was carried out with the aim of evaluating the nursing diagnoses made by third-year public health nursing students using the Omaha System.

METHODS

This study was carried out as a retrospective, analytical study between 02 March-18 May 2016. It was planned to include 51 students who the took public health nursing course. Data were collected same academics years. However, the study was continued with 41 students as 10 of them did not agree to participate in the study. The practice files of these students who applied at 4 Family Health Centers (ASM) located in Umraniye, Istanbul province were examined.

Characteristics of Students

At Acıbadem University, Faculty of Health Sciences, Nursing Department, 3rd year students took part in the research. Students who took the Public Health Nursing course during the spring semester had internal medicine, surgery, pediatrics, and gynecology nursing courses before taking the course. On top of this knowledge, the public health nursing course was given the students as 3 hours of theoretical lectures and 8 hours of practical lectures per week.

The nature of the public health nursing course is different from the nature of the clinical field courses. The learning objectives are therefore different and broad. Within the scope of the research, the practice objectives of the public health nursing course expected from the students are as follows:

- To know the basic philosophy, duties, powers and responsibilities of public health nursing,
- To provide health services to the individuals from all age groups as a public health nurse,
- Pregnancy follow-up and follow-up of the child between 0-1 years of age
- Use Omaha System and make appropriate nursing diagnose
- To be able to make at least 1 nursing diagnosis suitable for 4 separate areas of Omaha System

Researchers' Characteristics

There were 1 assistant Professor and 1 lecturer in the field of Public Health Nursing at same institution in the study.

Phases of Teaching Omaha System

To enable students to use the Omaha System professionally as a part of the research:

- In the public health nursing course, the Omaha System was explained for 2 hours theoretically.
- After the theoretical presentation, the instructors explained the care plan based on one

sample case, according to the Omaha System.

- The class of 51 people was divided into 10 groups. 10 separate case scenarios were given and students were asked to prepare a nursing care plan according to the Omaha System.
- The workshops were conducted by presenting the cases prepared by the groups in the class environment.
- Two separate families were assigned to the students when they went out for field practice. The students were requested to collect data from the families according to the Omaha System.
- The students visited each of the families they were assigned 3 times and prepared the practice file.
- The practice files prepared by the students were discussed with the instructors in the practice field.
- The instructors made home visits at least once with each student. During these home visits, the instructors identified problems for the family according to the Omaha System.
- One of these practice files prepared by the students is included in the research.

In accordance with the practice objectives of the course, the practice files were examined according to the following criteria (Table 1). According to the Table 1; at least one nursing diagnosis must be placed in each area. The qualifications of the students are determined according to the types and number of diagnoses that they put.

Data Collection

The data were collected with the "Characteristics of Family Form", the "File Assessment Form (Student)", and the "File Assessment Form (Educator)", which were created by the researchers in accordance with the literature.

1. Characteristics of Family Form: The surname of the family, family type, number of family members and their ages were recorded on this form.

2. File Evaluation Form (Student): This form consists of problems in Omaha PCL. In this form, problem areas and nursing diagnoses identified by the students are marked.

3. File Evaluation Form (Instructor): This form consists of problems in Omaha PCL. In this form, the problem areas and nursing diagnoses identified by the instructors are marked.

Research Questions:

1- Can students choose the nursing diagnoses included in the Omaha system they were introduced to recently?

2- What are the levels of competence of students to identify nursing diagnoses in the Omaha system they were introduced to recently?

Ethical Aspects of the Research

This study was approved by the ethical review boards at the authors institution (Number: ATADEK: 2016-11).

Statistical Analysis

The data were evaluated using the number and percentage distributions of variables in the SPSS 15 statistical program.

RESULTS

When the practice files of 41 students who took the public health nursing course and followed 2 families in practice area were examined, the following findings were obtained.

The Characteristics of Examined Families

Of the families who examined in the research, 87.8% (n = 36) were living in a nuclear family and 9.8% (n = 4) were living in extended families. Thirty-

Table 1. Levels of competence according to nursing diagnoses determined by students

Qualification Level	Environmental Domain	Psychosocial Domain	Physiological Domain	Health Behavior Domain
Inadequate	<1	<1	<1	<1
Adequate	1	1	1	1
Good	1	2	3	4
Excellent	>1	>2	>3	>4

Table 2. Students' nursing diagnoses

Diagnosis Domain and Nursing Diagnosis	Symptoms and Findings	Number	%
Physiological Domain			
22. Teeth	03. Tooth decay	11	9.7
33.Antepartum/Postpartum	06. Difficulty in breastfeeding	12	10.6
Health-Related Behaviors Domain		18	10.9
35. Nutrition	05. Imbalanced nutrition		
37. Physical Activity	02. Inadequate / irregular exercise	17	10.3
38. Personal Hygiene	05. Insufficient oral care/ brushing of teeth and flossing	15	9.1
39. Substance Use	03. Smoking	17	10.3
40. Family Planning	01. Having incorrect/ inadequate knowledge about family planning methods	24	14.6

nine percent of the families had three members, 24.4% had four members and 36.6% had five members. The age range of mothers was between 21-30 years (53.6%), while the age range of fathers was between 26-30 (34.1%). Most of the families (43.9%) had one child, while 29.3% of the families had two children.

Making Nursing Diagnoses Using the Problem Classification Scheme

We observed that the students identified 412 problems using the Omaha PCS. The most commonly identified domain was health behavior (n =164), the second was physiological (n = 112), the third was psychosocial (n = 76), and the fourth was the environmental domain.

Using the Omaha PCS, educators identified and examined 1,142 problems. The most common problem was in the health behavior domain, followed by physiological (n = 273), psychosocial (n = 245), and environmental domains (n = 223).

The most common problems that the students selected in the PSC were having incorrect/ inadequate knowledge about family planning methods (n = 24), imbalanced nutrition (n = 18), smoking (n = 17), inadequate/irregular exercise (n = 17), insufficient oral care/brushing of teeth and flossing (n = 15), difficulty in breastfeeding (n = 12) and tooth decay (n = 11) (Table 2).

The most commonly selected problems by the educators in the PCS were insufficient oral care/brushing teeth and flossing (n = 35); inadequate/irregular exercise (n = 30); inadequacies in periodic dental and medical checkups (n = 30);imbalanced nutrition (n = 27); frequently waking up at night (n=26); having incorrect/inadequate knowledge about family planning methods (n = 26); using a method with a limited effect/using it irregularly (n = 25); sedentary life style (n = 25); tooth decay (n = 25); difficulty in coping with stress (n = 25); inappropriate exercise/resting/nutrition behaviors (n = 23); scarcity of external stimuli/leisure activities (n = 21), and low income (n = 21) (Table 3).

Competence Levels of Students in Determining Nursing Diagnosis by Using Omaha System

Of the 41 practice files examined, 24.3% of the students were found to be adequate, 26.8% of the students were good, and 21.9% of them were found at a very good level in determining the nursing diagnosis from the Omaha System. 26.8% of the students were found to be inadequate to determine the nursing diagnosis according to the Omaha System.

The Distribution of Categories of Nursing Intervention in the Diagnosis Domain

Students identified 397 categories of nursing intervention for 412 problem domains. When these categories were examined, it was seen that intervention categories intended for health education, guidance and counseling (n = 377), case management (n = 15) and treatment process (n = 5) were most often implemented. For 1,142 problem domains identified by the educators, 1,144 nursing intervention categories were identified. After careful consideration, the first nursing intervention category was identified as health education, guidance and counseling (n = 1,118); the

Table 3. Educators' nursing diagnoses

Diagnosis Domain and Nursing Diagnosis	Symptoms and Findings	Number	%
Environmental Domain			
01. Income	01. Low income	21	9.4
Psychosocial Domain			
07. Social Contact	03. Scarcity of external stimuli /leisure activities	21	8.6
12. Emotional Stability	09. Difficulty in coping with stress	25	6.1
Physiological Domain			
22. Teeth	03. Tooth decay	25	6.1
33. Antepartum/Postpartum	02. Inappropriate exercise/resting/ nutrition behaviors	23	8.4
Health-Related Behaviors Domain			
35. Nutrition	05. Imbalanced nutrition	27	6.6
36. Sleep and Rest Patterns	02. Frequently waking up at night	26	6.4
37. Physical Activity	01. Sedentary life style	25	6.1
	02. Inadequate/ irregular exercise	30	7.4
38. Personal Hygiene	05. Insufficient oral care/ brushing teeth and flossing	35	8.6
40. Family Planning	01. Having incorrect / inadequate knowledge about family planning methods	26	6.4
	02. Using a method with a limited effect/using it irregularly	25	6.1
41. Health Care Supervision	01. Inadequacies in periodic dental and medical examinations	30	7.4

second was the treatment process (n = 14); and the third was case management (n = 12).

DISCUSSION

In this study, the practice files prepared by students during the practice of public health nursing were examined. Both students and educators identified the problems related to the health behavior domain during the home visits as ranking in first place. It can be said that the students are similar to the educators in the nursing skills of this area.The problems related to the physiological domain ranked second, and the psychosocial and environmental domains ranked third and fourth respectively. The study by Erdoğan and Esin [3] also identified and listed problems in the same order of health behavior, physiological, psychosocial and environmental domains. However, this order was psychosocial, environmental, physiological, and health behavior domains in the study by Slack and McEwen [15]. In the other studies using the Omaha System, physiological health problems were identified as the most important [1, 10, 11, 13-15].

It was determined that 73% of the students were adequate when considering the nursing diagnoses determined according to the Omaha System. However, 26.8% of the students were inadequate in establishing a nursing diagnosis using the Omaha System. This inadequacy of the students has been mainly in identifying the nursing diagnosis of the environmental and psychosocial areas. In the first 3 years of nursing education, students are more concentrated on the physiological problems of the individual by performing clinical field applications. In public health nursing class, it is thought that students use nursing diagnoses specific to the field of health behavior more because the educational role of public health nurses is emphasized.

In accordance with the PCS, students determined that the most commonly-coded diagnoses in the health behavior domain were having incorrect/inadequate knowledge about family planning methods, imbalanced nutrition, smoking, and inadequate/irregular exercise (Table 2). Diagnoses identified by the educators were in the areas of personal hygiene, inadequacy in periodic dental and medical examinations, inadequate/irregular exercise,

having incorrect/inadequate knowledge about family planning methods, and waking up frequently at night (Table 3). In the study by Kulakçı and Emiroğlu [13], the most frequently identified nursing diagnoses within the health domain were related to personal care, physical activity, sleep, resting and nutrition. The study by Martin *et al*. [8] reported that problems were discovered in the domains of pregnancy and nutrition, health care supervision in health management, and interpersonal relations and mental health. In the study by Brooten *et al*. [6], health care supervision and nutrition received the most frequently assigned diagnoses, especially for women with high-risk pregnancies. Inadequacy in periodic dental and medical checkups was found to be one of the most important health care supervision problems. In the study by Slack and McEwen [15], 67% of the community required education about diet, physical activity, and nutrition. Although the studies were conducted on different populations, some basic nursing diagnoses had common factors (e.g. physical activity, nutrition). The results of this current study showed similarities to the literature.

The most frequent nursing diagnoses in the physiological domain, which were coded by the students, targeted tooth decay and difficulty in breastfeeding, whereas the educators coded tooth decay, inappropriate exercise/resting/nutrition behaviors in this same domain. Differences and similarities were observed between the nursing diagnoses coded by the students and the educators. The differences in this domain could be attributed to students' focus on the breastfeeding training that they would give to women who had recently given birth, whereas the educators could interact with the women with a more holistic point of view. Although the study by Gür *et al*. [11] identified most of the problems to be in the physiological domain, the teeth were reported to be the fourth most important problem. Aylaz *et al*. [1] found that 36.4% of the individuals had inadequate oral and dental care. The results of this study were similar to those of the literature.

Within the parameters of the PCS, none of the nursing diagnoses in the psychosocial domain were cited as the most frequent diagnosis by students who indicated that they experienced difficulties in collecting data in the psychosocial domain. These areas included sexuality, abuse, neglect, contact with community resources, and social relations. They also stated that they recognized the limits of the interventions to be implemented. The nursing diagnoses identified by the educators within the psychosocial domain were the scarcity of external stimuli/leisure activities and the difficulty in coping with stress. The Yoo *et al*.'s study [5] also reported problems in stress management in this domain.

While referring to the PSC, students were unable to identify a nursing diagnosis for the environmental domain. They expressed that they felt they were not experienced enough to do so. On the other hand, the educators identified the nursing diagnosis of low income from this domain. In the study of Aylaz *et al*. [1], the diagnosis of low income (30.9%) and difficulty to provide their needs (27.3%) in the families were determined mostly. Additional support for this nursing diagnosis comes from the Monsen *et al*.'s study [12] which determined that mothers and children with low income were at high risk for developing serious health problems. Another study by Brooten *et al*. [6] reported the income diagnosis in every domain.

Students and educators determined the nursing intervention categories after identifying the domains with problems. Both groups found a high number of nursing diagnoses belonging to the categories of health education and guidance and counseling. The same conclusions were reached in the study by Erdoğan and Esin [3]; and our own study reflected similar results. The study by Brooten *et al*. [6] determined that surveillance was the main nursing intervention category to be reported. Yet the results of our study differ from the Brooten *et al*.'s study [6].

CONCLUSION

Students were found to be at a sufficient level to determine nursing diagnosis using Omaha System. They choose the nursing diagnoses included in the Omaha System. However, it is thought that the instructors should use a wider range of environmental and psychosocial areas that are 2 of the 4 areas of Omaha PCL, which are used in the field of public health nursing course.

We recommend that students be offered more case studies to be reviewed and assessed using the Omaha System in their public health nursing practice courses. We also suggest the following:

- Create more opportunities for case discussion and simulation methods to facilitate students' learning how to execute a comprehensive assessment approach to the family and its environment.
- Emphasize that each stage of the nursing process as featured in the Omaha System is connected to the others, and these should be evaluated together.
- Require students to prepare more case studies in the practice fields.

Highlights

- In accordance with the Omaha Classification List, students found 412 problems, whereas the educators found 1,142 problems.
- We observed that the students identified 412 problems using the Omaha Problem Classification Scheme. The most commonly identified domain was health behavior (n = 164), the second was physiological (n = 112), the third was psychosocial (n=76), and the fourth was the environmental domain.
- Using the Omaha Problem Classification Scheme, educators identified and examined 1,142 problems. The most common problem was in the health behavior domain, followed by physiological (n = 273), psychosocial (n = 245), and environmental domains (n = 223), respectively.
- Although there were similarities between the nursing diagnoses identified by the students and the educators, the problems identified by the students were limited.

Authorship Declaration

All authors listed meet the authorship criteria according to the latest guidelines of the International Committee of Medical Journal Editors, and all authors are in agreement with the manuscript.

Author contributions

All of the authors have contributed to the study on conception and design, drafting the article, revising it critically for important intellectual content, and final approval of the version to be published. All authors are in agreement with the content of the manuscript.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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