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Using the Omaha System in occupational health nursing applications: Advantages of a common language in the diagnosis, intervention and evaluation of nurses' health problems

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Abstract

This study was conducted to determine the suitability of applying the Omaha System to the occupational health problems experienced by nurses working in hospitals. The Omaha System is a system which will facilitate the use of a standard common language in occupational health nursing applications. This semi-experimental study was conducted with two follow-ups. The first follow-up evaluations were carried out in a private hospital with 175 nurses out of a total of 208 nurses. The second follow-up occurred with the evaluation of 162 nurses out of a total number of 187. All nurses were scheduled to take part in the study. In between follow-up sessions, at least three interviews were conducted with the nurses experiencing problems, and applications and evaluations for the occupational environment were also carried out. Their problems were assessed according to the Omaha System. Surveillance initiatives were implemented in the nursing interventions for all diagnostic areas, and most of the nursing diagnoses were concentrated within the physiological domain. For nurses working in hospitals, the Omaha System was found to be useful in nursing diagnoses, interventions and evaluations within the practice of occupational health nursing.

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1. Introduction

Record keeping is a part of professionalism, and the nurses must document their nursing activities by keeping records. Maintaining records of nursing activities and naming these records with a common language are very important for the profession on a scientific level (Birol 2004). Today, many different classification and coding

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systems have been developed for different areas of nursing. One of these is the Omaha System (OS) developed by the American Visiting Nurse Association (VNA) and approved by The American Nurses Association (ANA) (Erdoğan 2003; Erdoğan et al. 2005). The most recent changes to this system were made in 2005 (Martin, 2005). Research on many issues has been carried out using this system including studies on acute care, discharge planning, determining health needs of certain groups, comparison of OS with other systems, student training, case management, and public health applications (Maggs 1997; Naylor et al. 2000, Erdoğan&Esin 2006, The Omaha System 2013; İşiçi&Esin 2009). With field studies in many countries, the system has been determined valid and reliable. Turkish validity and reliability of the system were determined by Erdogan and Esin (Erdoğan&Esin 2006).

OS is composed of three parts: Problem Classification Scheme (PCS), Problem Rating Scale for Outcomes (PRS) and Intervention Scheme (IS). The PCS is composed of four domains: Environmental, Psychosocial, Physiological and Health-related Behaviors. There are 42 problems within the four domains from which a nursing diagnosis is eventually made. The PRS is a five-point Likert-type scale, and it is used to evaluate the knowledge level, the behavior and the current status. IS is a taxonomy of nursing activities and consist of four categories: Teaching, Guidance, and Counseling; Treatments and Procedures; Case Management and Surveillance (Martin 2005).

It is thought that the system used in public health nursing education and researches in Turkey (Erdogan&Esin 2006) contributes to the development of the nursing database for this area by its use in occupational health nursing (OHN) applications. The work area of the occupational health nurse is also the workplace of other employees. However, it is known that occupational health services for nurses and other health professionals, who are not only indispensable employees of the health care team but who are also faced with many health risks themselves, have been ignored (Lipscomb & Borwegen 2000). Therefore, a decision has been made to provide occupational health services to nurses and to keep records of these services. In this way the details of the OHN applications recorded using the OS and their suitability to the usage of the system in this area can be determined.

2. Method

2.1. Sample

This study was carried out to determine the suitability of using the OS in OHN applications for health problems of the nurses working in hospitals. The OS would properly document the OHN applications, and the health issues experienced by the nurses can be accurately recorded. A semi-experimental design was used in this study. The study was carried out with nurses in a private hospital in the capital of Turkey. The first follow-up was performed between April 2007 and August 2008, and the second follow-up occurred between September 2008 and March 2009. In the first follow-up, 175 nurses were evaluated out of 208 nurses, and 162 nurses were evaluated in the second follow-up out of a total of 187 nurses working in the hospital. Not all nurses were able to participate in the follow-ups due to resignation, retirement, or taking leave for prenatal and postnatal reasons.

Table 1. Some of descriptive characteristic of nurses at first and second follow-up

| | First follow-up | Second follow-up |
|-----------------|-----------------|------------------|
| Female | 95% | 97% |
| Age | 68% | 64% |
| Single | 61% | 56% |
| Have a child | 71% | 73% |
| Work years | 70% | 57% |
| Graduate degree | 67% | 67% |

2.2. Data collection

The data were collected by using various forms created by the researcher. These forms are described below.

Working Environment Risk Assessment Form: The working areas were evaluated two times in terms of physical, chemical, biological and other risks.

Periodic Surveillance Form: This form contains the individual’s socio-demographic characteristics, health histories and physical examination information. A researcher prepared each nurse's personal file and conducted two follow -up during the application. The Periodic Surveillance form was used in these follow-ups. At the end of each follow up, three interviews were conducted with the nurses who had health problems.

Workplace Nursing Referral Form: After the periodic surveillance and employment examination, the researcher referred the nurses to the occupational health physicians using this form and requested their professional opinions.

Accident and Injury Notification Form: The standard form used by hospitals to report accidents and injuries.

Pregnancy Surveillance Form: This form is used for monitoring the pregnancies of employees.

OS: Health problems identified during follow-ups were classified using the PCS. The diagnoses arrived at by the researcher according to the PCS are for actual problems. The diagnoses for potential problems were not discussed. Diagnoses were recorded with the IS and the attempts that were made to fix the problem were indicated in the diagram. Nursing interventions were conducted for health education/guidance/consulting, treatment/processing, case management and surveillance. Using the PRS, changes in the nurse’s health problems were noted with a score from 1 to 5. At least three interviews with the nurses were conducted, and their scores were evaluated using the PRS for each interview.

2.3. Ethical consideration

Permission to conduct the study was obtained from the Nursing Directorate of the hospital where the research was conducted. Approval to carry out this research was granted by the Ethics Committee of the Hacettepe University (Meeting Date: 11/29/2007, Resolution No. 07/60-42 LUT). All study participants were thoroughly informed about the aims of the study, and their privacy and confidentiality were guaranteed. Those who participate gave their written consent for the study.

2.4. Data analysis

The numbers and percentages used in the evaluation of the data obtained during the study.

3. Results

Table 2. The first follow-up problem domains and problems of the problem classification scheme (* N=636)

| Problem domains and problems | n | % |
|---------------------------------|-----|------|
| Environmental Domain | 65 | 10,2 |
| Psychosocial Domain | 17 | 2,7 |
| Physiological Domain | 360 | 56,6 |
| Health-related Behaviors Domain | 194 | 30,5 |

*Percentages are based on a total number of problems (N:636)

During the first and second follow up showed that most of the diagnoses were in the Physiological Domain. Although many measures have been put in place to ensure a safe hospital environment, observations and measurements determined that there were problems related with lighting, ventilation, temperature, humidity and ergonomics. The problems noted in the Health-Related Behaviors Domain were related primarily to nutrition (Table 2-3).

Table 3. The second follow-up problem domains and problems of the problem classification scheme (* N=1280)

| Problem domains and problems | n | % |
|---------------------------------|-----|------|
| Environmental Domain | 80 | 6,3 |
| Psychosocial Domain | 69 | 5,4 |
| Physiological Domain | 682 | 53,2 |
| Health-related Behaviors Domain | 449 | 35,1 |

* Percentages are based on a total number of problems (N:1280)

Table 4. The first follow-up intervention frequency for problem domains

| Problem domains | Health teaching, guidance, and counseling | | Case management | | Surveillance | | Treatments and procedures | | Total |
|---------------------------|---|------|-----------------|------|--------------|------|---------------------------|-----|-------|
| | n | % | n | % | n | % | n | % | |
| | Environmental | 57 | 35,0 | 44 | 27,0 | 62 | 38,0 | 0 | |
| Psychosocial | 17 | 44,7 | 4 | 10,5 | 17 | 44,7 | 0 | 0,0 | 38 |
| Physiological | 235 | 27,2 | 219 | 25,3 | 387 | 44,8 | 23 | 2,7 | 864 |
| Health-related behaviours | 187 | 43,9 | 21 | 4,9 | 183 | 43,0 | 35 | 8,2 | 426 |

According to the guidelines put forth in the IS, surveillance and then health education/guidance/consulting should first be conducted for all diagnostic domains during the first and second follow-up (Table 4-5).

Table 5. The second follow-up intervention frequency for problem domains

| Problem Domains | Health teaching, guidance, and counseling | | Case management | | Surveillance | | Treatments and procedures | | Total |
|---------------------------|---|------|-----------------|------|--------------|------|---------------------------|-----|-------|
| | n | % | n | % | n | % | n | % | |
| | Environmental | 54 | 31,6 | 47 | 27,5 | 70 | 40,9 | 0 | |
| Psychosocial | 65 | 43,3 | 19 | 12,7 | 66 | 44,0 | 0 | 0,0 | 150 |
| Physiological | 581 | 32,8 | 367 | 20,7 | 772 | 43,6 | 50 | 2,8 | 1770 |
| Health-related behaviours | 375 | 44,9 | 43 | 5,1 | 357 | 42,8 | 60 | 7,2 | 835 |

After both follow-ups in the evaluation pertaining to knowledge, status and behavior categories in the PRS, there was an increase in the average scores of status and behavior in the environmental domain, mainly in the knowledge category. The same increase seemed to be valid in the mean scores for the psychosocial, physiological and health-related behaviors domain. The best mean scores appeared to be in the physiological and health-related behaviors domains.

4. Discussion

4.1. Domains in problem classification scheme

In this study, identified problems for the working environment were evaluated under the headings of the environmental domain which is the first of the of OS's diagnostic domains:

4.1.1. Environmental domain

In the environmental domain there were problems with lighting, ventilation, temperature, humidity and ergonomics. A good lighting is required in order to work efficiently, to protect the employee's eye health, to prevent occupational accidents and to ensure a positive psychological effect (Varol Saraçoğlu et al. 2004). This study found additional lighting in different areas of the hospital (i.e. waiting area near the elevator) and in the places which require natural lighting (chemotherapy preparation room, most of the clinic rooms and two treatment rooms) only artificial lighting was used.

Ventilation systems in hospitals must supply a proper air stream to ensure a suitable temperature and humidity and to protect the health of staff and patients (Hospital Ventilation System Principles). Hospital authorities had made efforts to improve hospital ventilation, these measures proved inadequate, and nurses found it difficult to work efficiently under these suffocating conditions. Reports showed lack of a suitable aspiration system in an area where a chemical substance was used intensively, and nurses also reported health problems related to side effects from this chemical.

In the hospital where this study was conducted and where the ASHRAE standards are used (American Society of Heating, Refrigerating and Air-Conditioning Engineers), the moisture content should be between 30-60% (Anıl et al. 2007). Measurements of the humidity in this study were between 23-28%, and on some of the inpatient floors the temperatures were higher than 24°C, and nurses working in the surgery room (18-20°C) and radiology complained about the cold.

During the day noise levels should measure 35 dBA in hospitals (Montague et al. 2009). In the study of Christensen (2005) in a general surgical unit for the noise level, the average noise level in this unit was measured as 42 dBA. He measured the noise level 36 dBA lowest (up to midnight to 7) and 70 dBA at the highest. In this study, during the day the noise measurements were recorded in the range of 38-78 dBA.

Nurses remain standing for long periods due to the nature of the nursing care profession. Studies showed that nurses working in internal medicine and intensive care units walk during 60-80% of their work shifts (5-7 km during the day, 17 km at night) (Bilir&Yıldız 2004). In addition, in this study follow-ups, nurses have complained about low back pain most likely due to various ergonomic problems in the workplace.

One of the many risks of working in a hospital environment is the occurrence of violent events. Studies have shown that 25% of all violent incidents occurred in the health sector workplace and that 50% of all health care workers are exposed to violence (Khorshid& Akın 2006). In order to keep such incidents to a minimum the NIOSH (2002) has proposed the development of environmental regulations, administrative control and behavior change, as well as contingency plans. An emergency action plan is needed to ensure that all personnel are adequately prepared for any possible violent incidents where the research is carried out.

4.1.2. Psychosocial domain

Compared to the first follow-up, diagnoses belonging to the psychosocial domain increased in the second follow-up (Table 2-3). This increase may have occurred because the nurses had become comfortable with the researcher, and they felt more at ease in expressing their psychological problems. In each of two follow-ups the "mental health and social contact" areas were among the most common health problems. The NIOSH (2008) has reported that the main causes of nurses' job stresses were the workload, time pressures, and the lack of social support. The researcher in this study observed that the participating nurses had been exposed to many stress factors identified by the NIOSH.

4.1.3. Physiological domain

In their study using the OS Leonardo et al. (2004) have found that many members of the sample group displayed health problems related to the physiological domain in the Omaha System. This study produced similar results. In the first and second follow-ups, the three most significant physiological health problems within the physiological domain of the Omaha were related to circulation, pain and communicable/infectious conditions (Table 2-3). Physiological health problems seen in some studies using the OS are as follows: The Barton *et al.* (2004) study determined the most common problems were related mostly to oral and dental health issues, pain, bowel function, pregnancy and postpartum, skin, speech and language. Leonardo *et al.* (2004) found participants had problems related to pain, skin and circulation; in the Erdogan & Esin (2006) study participants exhibited problems with the circulatory and musculoskeletal system.

4.1.4. Health-related behaviors domain

During their interviews nurses reported that working hours and conditions affect their nutrition and physical activities. Findings also indicated that the eating habits of nurses living with their parents were better than those of the nurses living alone. In the health-related behaviors domain during the second follow-up the most common problem after nutrition was the lack of physical activity (Table 3). Nurses reported very busy work schedules where they are quite active but remain standing on their feet all day. Afterwards they are then physically exhausted, so adding regular exercise to their daily lives becomes nearly impossible. Nurses attempting to exercise cannot find the time due to the shift work system. In the study of Alçelik et al. (2005) 28.4% of nurses try to exercise but cannot do so on a regular basis.

In the first and second follow-ups substance use was found to be one of the most important problems in the domain of health-related behaviors (Table 2-3). In the study of Yoo *et al.* (2004) using the OS with families, 32.3% displayed symptoms of substance abuse related to "cigarette/tobacco products, the use of smoking", and alcohol abuse was found in 36.0%. Cigarette smoking was found in 36.8% of nurses in the study of Alçelik *et al.* (2005) and

49.8% of the nurses in the study of Sayan *et al.* (2009). The main reasons given for smoking seemed to be job stress, professional role confusion and the fact that family members and work associates also were smokers (Sayan *et al.* 2009). Most nurses in this study stated they did not like smoking and wanted to quit. However, they found the withdrawal symptoms so debilitating when they tried to quit that they soon relapsed and began the habit again.

Working various shifts throughout the day and night influences the physical, mental and social structure of humans, makes it impossible to keep a daily routine and can lead to many health problems. (Selvi *et al.* 2010). One of the major problems for nurses working the shift system is the change and disruption in their sleep and rest patterns. During the first and second follow-ups of this study according to the OS health-related behaviors domain, sleep and rest pattern problems were determined (Table 2-3)

4.2. *Intervention scheme*

According to the IS in the two follow-ups, the most frequent surveillances in all domains were related to health education/guidance/consulting, case management and treatment/processing interventions respectively (Table 4-5). Erdogan and Esin's (2006) study found that the most frequently used nursing intervention categories were health education/guidance/consulting, surveillance, case management, and treatment/processing. İşçi and Esin (2009) had used OS in OHN initiatives and in nursing interventions for diagnosis of "Joint Movements Disability/Decrease in Muscle Strength." They had also studied how to recognize, reduce and kill pain and had planned the nursing initiative of 2484 for this diagnosis. In this study, nursing initiatives focused on pain management in surveillance, health education/guidance/consulting and case management respectively. In the second follow-up, the nursing initiative of 255 was planned for pain diagnosis.

4.3. *Problem rating scale for outcomes*

In the first and second follow-ups, according to the PRS, an increase in the average points of the information, status and behavior in all four domains was found. In the two follow-ups the best average points in all domains were in physiological and health-related behaviors domains. One reason for this optimal score may be the easy identification and resolution of physiological and health behaviors according to the psychosocial problems. In the applications carried out by the researcher, it should also be taken into consideration that the nurses' sensitivity and concern for their own health may have increased. .

4.4. *Evaluation of the use of OS*

Most of the nursing diagnoses in the PCS were used in this study. Nursing interventions were planned and implemented by recording the diagnoses to the IS. By observing the changes in the information, status and behavior of the health problems of the individual being monitored, the values were recorded in the PRS. This tripartite structure of the OS enabled the researcher to operate according to plan and to determine that the plan worked, to assess the applications or practices, and to follow the change in those individuals being monitored. Furthermore, using this system in the practice of OHN proved practical and effective for recording data in a systematic way.

5. **Conclusion**

Usage of the OS in the field of OHN is an effective tool for assessing and recording nursing diagnoses in a systematic way. Nurses' health problems can be recorded with this system. Although the PRS assesses problems from a subjective point of view, it is still very useful in assessing the health problems of individuals and groups as well as the person who makes the application. Results of our study conclude that the OS is useful in OHN applications and for recording the health problems of nurses that already been identified.

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