

Describing Occupational Health Nursing Interventions and Outcomes in Hair Stylist Apprentices With Hand Eczema Using the Omaha System as a Framework

Emine Aktas, M. Nihal Esin, and Karen A. Monsen

ABSTRACT: The Omaha System is one of the most applicable classification systems and can be used effectively to recognize occupational health nurse(s) in practice. Describing occupational health nurse interventions and outcomes can be an example for planning care in a specific case such as hair stylist apprentices with hand eczema symptoms by using the Omaha System. The study consists of 15 cases.

Emine Aktas, PhD, RN, Istanbul University-Cerrahpasa, Florence Nightingale Faculty of Nursing, Public Health Nursing Department, Istanbul, Turkey.

M. Nihal Esin, PhD, RN, Istanbul University-Cerrahpasa, Florence Nightingale Faculty of Nursing, Public Health Nursing Department, Istanbul, Turkey.

Karen A. Monsen, PhD, RN, FAMIA, FAAN, University of Minnesota School of Nursing, Minneapolis, MN.

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Correspondence concerning this article should be addressed to Emine Aktas, PhD, RN, Istanbul University-Cerrahpasa, Florence Nightingale Hemsirelik Fakultesi, Abide-i Hürriyet Caddesi 34381 Sisli/Istanbul, Turkey. E-mail: emineak@iuc.edu.tr

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The "Turkish-Nordic Occupational Skin Questionnaire" was used for data collection related to eczema symptoms. The assessment was made by using electronic health record system based on the Omaha System. For the 15 cases, 113 problems and 624 nursing interventions were reported. According to the Omaha System's Problem Classification Scheme, the frequently diagnosed problems were *skin* (100%), *neighborhood/workplace safety* (100%), *health care supervision* (67%), *respiration* (53%), and *pain* (40%). The identified intervention categories were 98.5% about teaching, guidance, and counseling; 89.2% about surveillance; and 6.4% about case management. The occupational health nursing outcomes scores were more likely to show higher level after the intervention ($p < .05$). The Omaha System can be effectively used in occupational healthcare settings for specific cases in workplaces.

Key words: Apprentice, Case Study, Electronic Health Record, Hair Stylists, Hairdressers, Hand Eczema, Occupational Health Nurse, Occupational Skin Diseases, Omaha System, Young Worker

Occupational skin diseases (OSDs) are one of the most frequently observed occupational diseases in many countries. They occur because of contact with allergens and irritating substances in the workplace. In particular, hand eczema (HE) comprises nearly

90% of all OSD symptoms (De Craecker et al., 2008; Lushniak, 2006). HE is an important health issue in those working as hairdressers, hair stylists, and barbers. The occupational activities of hair stylists are classified as risky in terms of HE because workers are frequently exposed to many hazardous substances. The most common symptoms of HE are itching and redness of the skin, dryness, flaking, swelling, cracks, and blisters (De Craecker et al., 2008; Flyvholm et al., 2002; Lushniak, 2006).

According to the International Labor Organization, the “young worker” group consists of those between the ages of 15 and 24 years and is the most vulnerable risk group in working life (International Labor Organization, 2011). Issues among young workers are considered to be among the most important issues in many developing countries, in addition to Turkey (Kolena et al., 2017; Miller, 2010; Roggero et al., 2007; Turkish Statistical Institute, 2012). Hand eczema has ranked as the second most common occupational diseases in Europe (De Craecker et al., 2008). In Turkey, young workers enroll at vocational training centers (VCTs) and generally prefer to study hairdressing/hair styling as apprentices (Turkish Statistical Institute, 2012). The number of studies about OSD symptoms in apprentice hair stylists is very limited, and generally, these studies did not use standardized methods or tools for intervention (Aktas & Esin, 2016b; Esin et al., 2005; Yenigun et al., 2010).

Occupational healthcare teams consist of doctors, nurses, occupational hygienists, health and safety practitioners, occupational therapists, and sometimes, physiotherapists and ergonomists. Occupational health nurses (OHNs) are at the front line in planning healthcare interventions to promote the health status of working populations (Koseoglu-Ornek & Esin, 2015; Rogers, 2003). Nurses should provide standardized and high-quality care for vulnerable populations and patients to improve their health outcomes. In recent years, it has been crucial to use a standardized terminology among nurses to objectively evaluate the contributions of nurses to the care of patients, families, and communities to increase the quality of nursing care and to compare patients' results. The Omaha System is accepted as one of the most applicable classification systems in nursing (Erci, 2012; Erdogan et al., 2016; Martin, 2005). It is used to describe nursing activities in research and practice, promoting the objective evaluation of nursing interventions in a standardized and electronic health record (EHR)-based manner (Martin, 2005; Martin et al., 2011; Martin & Utterback, 2014; Monsen et al., 2016).

Today, there are many standard nursing languages and terminologies developed and used by nurse researchers around the world to outline nursing care. The most common terminologies include the North American Nursing Diagnosis Association taxonomy, the Nursing Interventions Classification, and the Nursing Outcome Classification, which are used to describe nursing diagnoses, interventions, and outcomes, respectively (Hendrix, 2009). Among the many

terminologies and classification systems, the Omaha System is one of the most comprehensive and is used in multidisciplinary settings (Martin, 2005; Martin et al., 2011; Martin & Utterback, 2014).

The current study is conducted on hair stylist apprentices with HE and aims to investigate health problems using the Omaha System. The study draws attention to the evaluation of the descriptive adequacy of the Omaha system in occupational health nursing interventions, focusing on hair stylist apprentices with HE as specific cases. The Omaha System might be better understood and used more effectively by OHNs and healthcare professionals by discussing specific cases selected from the working community. OHNs could gain awareness of the importance of documentation of nursing intervention and the use of the Omaha System as a standardized terminology that is based on the EHR. Therefore, this study provides valuable information for OHNs and other healthcare professionals (Isci & Esin, 2009; Koseoglu-Ornek & Esin, 2015; Rogers, 2003).

THE OMAHA SYSTEM

The Omaha System is one of the oldest standardized terminologies and was developed by multidisciplinary researchers and health practitioners. Research to develop the Omaha System began at the Visiting Nurse Association of Omaha, Nebraska, in the 1970s. The goal was to create a multidisciplinary taxonomy for evaluating, describing, and measuring healthcare outcomes in a variety of healthcare services, such as home care, primary care, palliative care, acute care, maternal and child health, occupational health, public health, school health, education of nursing students, and many other clinical settings. Among all of the standardized nursing terminologies recognized by the American Nurses Association, the Omaha System is considered the most important terminology in data collection and in measuring and reporting the outcomes and impact of healthcare services in accordance with current EHR systems (Omaha System Website: <http://www.omahasystem.org>). The codes of the Omaha System are very well designed and are applicable to all individuals, families, and communities of all ages, sociodemographic and socioeconomic statuses, medical diagnoses, ethnicities, spiritual beliefs, and cultural values (Holland et al., 2016; Monsen et al., 2012; Olsen et al., 2017). The Omaha System was translated and adapted into Turkish language, and it has been used in Turkey in research and nursing student education settings as a valid and reliable tool since the 1990s (Erdogan et al., 2016; Erdogan & Esin, 2016; Erdogan et al., 2013).

The Omaha System comprises three integrated components: the Problem Classification Scheme (PCS) for assessment of care and classifying patient health problems, the Intervention Scheme for describing the interventions, and the Problem Rating Scale for Outcomes to evaluate the

outcomes and measure the impact of healthcare (Martin, 2005). The PCS includes 42 problems that are categorized into the following four main domains: the environmental domain, the psychosocial domain, the physiological domain, and the health-related behaviors domain. Each of the problems is indicated by specific signs and symptoms and is coded based on whether the identified problem affects the individual, family, or community. The Intervention Scheme has four intervention categories: teaching, guidance, and counseling (TGC); treatments and procedures (TP); case management (CM); and surveillance (S). According to the intervention categories, the healthcare providers determine the action from a list that consists of 76 specific targets that most accurately define the client's needs and interventions. The Problem Rating Scale for Outcomes is the final step in evaluating the clients' care processes and measuring the outcomes. Problem Scale for Outcomes includes three Likert-type scales for for measuring parameters of Knowledge, Behavior, and Status (KBS) to evaluate problem severity and the impact of healthcare. It uses a 5-point Likert scale to rate knowledge (what the client knows about the problems), behavior (whether the client/care providers practice appropriately), and status (the client's health status and whether there is any change; Martin, 2005; Martin et al., 2011; Martin & Utterback, 2014).

In recent years, the Omaha System has been integrated into the EHR system, the use of which has increased dramatically. Integrating the Omaha System into the EHR provides a method to standardize clinical data, examine the quality of care, and generate globally comparable outcome reports. Therefore, EHR based on the Omaha System contributes to the visualization of healthcare professionals' evidence-based practices. In this context, the Omaha System will provide an opportunity to elicit knowledge from nursing-generated data sets that can be used to improve the quality of care (Martin et al., 2011; Martin & Utterback, 2014).

In recent decades, the Omaha System has been officially set as an EHR program adapted to the software in Turkey, known as Nightingale Notes (NN). In the assessment of OSD and, most importantly, prevention of health problems and planning of multidisciplinary care and supervision of individuals, OHNs play crucial roles. Therefore, research is needed to determine how OHNs' data recorded with the Omaha System could be used as a tool to measure specific cases to fill gaps in knowledge. According to the literature, this is the first study in which an EHR-based Omaha System was used for planning and evaluating care in the vulnerable client group of hair stylist apprentices with HE.

This study is aimed at assessing the suitability of the Omaha System in occupational health settings for describing the occupational health nursing interventions and outcomes of hair stylist apprentices with HE symptoms in Turkey. Moreover, this study aims to clarify the need for EHR systems at occupational healthcare services and dermatology services, which may help make nurse care more visible.

From the outset, the following research questions were formed: (a) Is the Omaha System suitable in occupational health nursing care settings for specific cases such as hair stylist apprentices with HE symptoms? and (b) What are the frequent problems, intervention categories, targets, and interventions for hair stylist apprentices with HE symptoms when using the Omaha System?

MATERIALS AND METHODS

Sample and Design

This study has a descriptive longitudinal design. The study was conducted at a VCT where apprentice hair stylists were trained and received apprenticeship certificates after graduation. All hair stylist classes at the VCT completed a reliable and self-administered questionnaire to define OSDs and related factors. At the same time, they were examined by an occupational physician specializing in skin diseases. After the assessment, 101 apprentices were diagnosed with different types of mild skin disease symptoms. At the end of assessment process, 15 of the apprentices were found experiencing severe scores of HE symptoms on their hands and forearms since starting their apprenticeships, and they were referred to the dermatology clinics for treatment.

Sample

The participants included 15 apprentice hair stylists with severe scores of HE symptoms such as itching, cracking, rash, redness, and dryness. Written consent form was obtained before enrollment in the study. The OHN started monitoring the health of 15 apprentice hair stylists with severe HE symptoms and documented health problem assessments using the Omaha System.

Data Collection

Data were collected in the classroom from apprentices with HE symptoms. The OHN used the Turkish-Nordic Occupational Skin Diseases Questionnaire (T-NOSQ) to determine severity of OSD symptoms and related factors. To describe common health problems accompanying skin problems of hair stylist apprentices diagnosed with HE, the Omaha System was used. To determine outcomes, nurses used the three components of the Omaha System: (a) problem classification scheme, (b) intervention scheme, and (c) problem rating scale for outcomes. The assessment was made using a Turkish EHR, based on the Omaha System, called NN software. The participants were informed about the study process. On the basis of the Omaha System, the interventions of the OHN were evaluated to appropriate categories: TGC, TP, CM, and S.

The T-NOSQ was applied to hair stylist classes to determine the self-report severity of the OSD symptoms and related factors. The apprentices who self-reported to have any OSD symptoms based on T-NOSQ ($N = 101$) were examined by an occupational physician in terms of HE symptom severity. The 15 apprentices identified at a high risk

for HE symptoms were referred to a dermatology service. These apprentices were included into the study, and their healthcare needs were assessed and monitored using the components of the Omaha System. The OHN monitored and visited the apprentices for 3 months and applied the intervention at the VCT's infirmary. The intervention was applied monthly for a 3-month period, with each visit lasting 2 hours. The data were entered into the EHR for each participant, and intervention and outcomes were reported according to identified problems, intervention category, and outcome scale of the Omaha System.

Measurements

The Turkish-Nordic Occupational Skin Diseases Questionnaire

The NOSQ was created as a self-report and reliable tool in English by the Nordic Working Group to evaluate OSD symptoms. The NOSQ includes 57 questions that are grouped into 10 different coded dimensions related to factors affecting OSD symptoms (Flyvholm et al., 2002; Susitaival et al., 2003). The long version of the NOSQ was adapted into the Turkish language and modified for the young workers' population to make it a reliable tool (Aktas & Esin, 2016a). To define the skin disease symptoms, Question D1 and Question D2 were used in the T-NOSQ in this study.

Omaha System Within EHR System: NN

NN (Champ Software Inc., North Mankato, MN) was the EHR system used for entering health records and data reporting based on the Omaha System's three components (Nightingale Notes Website: <https://www.champsoftware.com/nightingale-notes-ehr/>).

The purpose of NN is to document nursing care and practices and to make nursing interventions visible. It includes components such as the patient record, healthcare services, the Omaha System and its components, and customizable data reporting. By using the Omaha System for recording, NN adheres to a common language used in nursing care. NN was developed to respond to the specific needs of public health departments.

The NN has been used in the United States in many public health departments to provide high-quality care to individuals/families/communities. It is a web-based electronic registration system that records nursing care. It increases quality of care by using evidence-based care guidelines (road maps) in nursing practice and evaluates effectiveness of nursing practices. In addition, it provides analysis of care plans that, based on Omaha System components, ensures that research initiatives and results are used most efficiently. The NN facilitates access to evidence-based and result-oriented reports and provides the diagnosis and monitoring of healthy people or patients at the individual, family, and community levels (Erdogan & Esin, 2016; Erdogan et al., 2016).

Ethics and Approval

Ethics committee approval was obtained from the Ethics Board Commission of the Medipol University (date: July 31,

2019; approval number: 479; 10840098-604.01.01-E.36707). In addition, written permission was obtained from the Istanbul Provincial Directorate of National Education concerning the VCT in which the work was conducted.

Data Analysis

The data were documented using the NN system and exported in CSV/Excel format from the system. The CSV files were imported into Excel (Microsoft, Redmond, WA) and analyzed in SPSS 21.0 (IBM Corporation, Armonk, NY). Standard descriptive and inferential statistics were employed to address the study aims. Statistical significance was set at $p < .05$ a priori.

RESULTS

The participants' mean age was 24 ± 2.3 years. Most (53%, $n = 8$) were female. Most (80%) participants worked more than 12 hours per day. The mean duration of their current occupation was 3.4 ± 0.8 years.

On the basis of physical examination of the participants, which was documented using T-NOSQ, the following HE signs/symptoms were found: itching (100%), cracking (80%), rash (100%), redness (60%), dryness (100%), and pain (40%). The most common locations of HE symptoms were the dorsum of hands (86.6%), interdigital folds of fingers (60%), and fingers (46.6%). Furthermore, most (53%) participants experienced a rash after they had contact with metal objects (metal materials, jewelry, etc.). All participants worked with water (hair washing, shampooing, etc.) and had contact with chemicals (hair dye formulations, hair sprays, etc.), and few (20%) used personal protective equipment while working. Although all participants had a health examination before they began their apprenticeships, only a few received occupational health services (26.7%) or participated in occupational health and safety education in their workplace (13.3%).

Problems

Participants had an average of 7.6 ± 3.6 problems. Of the 42 problems in the Omaha System PCS, 12 were identified in the participants. The most common problems identified were *skin* (100%) and *neighborhood/workplace safety* (100%), followed by *health care supervision* (67%), *respiration* (53%), and *pain* (40%). Other less frequent problems were *nutrition* (28%), *mental health* (13%), *physical activity* (7%), *substance use* (7%), *neuro-musculo-skeletal function* (7%), *hearing* (7%), and *circulation* (7%).

Signs/Symptoms

The signs/symptoms of the *skin* problem were excessively dry (100%), rash (100%), pruritus (100%), inflammation (60%), and other (80%, e.g., cracking).

The signs/symptoms of the *neighborhood/workplace safety* problem were inadequate space/resources to foster health (100%), physical hazards (60%), chemical hazards

(93.3%), and other (40%, e.g., biological hazards, inadequate protective equipment).

The signs/symptoms of the *health care supervision* problem were inadequate sources of healthcare (70%), inadequate treatment plan (20%), fails to obtain routine/preventative healthcare (80%), inconsistent source of healthcare (80%), fails to return as requested by healthcare provider (60%), and fails to seek care for symptoms requiring evaluation/treatment (80%).

The signs/symptoms of the *respiration* problem were abnormal breath patterns (75%), cough (62.5%), and rhinorrhea/nasal congestion (37.5%). The signs/symptoms of the *pain* problem were expression of discomfort/pain (100%) and facial grimaces (33.3%).

Interventions

Participants received an average of 41.6 ± 3.2 interventions from three of four intervention categories. Most were TGC (53.8%), followed by S (28.2%) and CM (18%). Of the 75 Omaha System target terms, 20 were documented in this study. The most frequent targets were skin care (24.6%), followed by the following signs/symptoms: physical (23.8%), nursing care (12.8%), environment (10.8%), and continuity of care (5%). The use of categories and target terms of the Omaha System's intervention scheme differed by problem (Figure 1).

The Problem Rating Scale for Outcomes Knowledge, Behavior, and Status (KBS) Scores by Problem

The mean KBS ratings for the problems most frequently identified increased significantly after intervention (Figure 2). For all problems, the lowest ratings at baseline were for knowledge.

The baseline knowledge scores were lowest for the *skin* problem (1.9) and highest for the *pain* problem (2.7). The final knowledge scores were lowest for the *neighborhood/workplace safety* problem (3) and highest for the *pain* problem (4). The greatest increase in knowledge was seen for the *skin* problem (Figure 2).

The baseline behavior scores were lowest for the *skin* problem (1.8) and highest for the *pain* problem (2.7). The final behavior scores were lowest for the *neighborhood/workplace safety* problem (3.4) and highest for the *respiration* problem (4). The greatest increase in behavior scores was seen for the *skin* problem (Figure 2). Furthermore, the use of personal protective equipment, which is related to *skin* and *respiration*, increased among participants after intervention.

The baseline status scores were lowest for the *skin* problem (2.1) and highest for the *health care supervision* problem (2.6). The final status scores were lowest for the *neighborhood/workplace safety* problem (3.6) and highest for the *pain* problem (4.7). The greatest increase in status scores was seen for the *pain* problem (Table 1).



FIGURE 1. Data visualization of interventions by problem, category, and target for hair stylists apprentices with hand eczema.

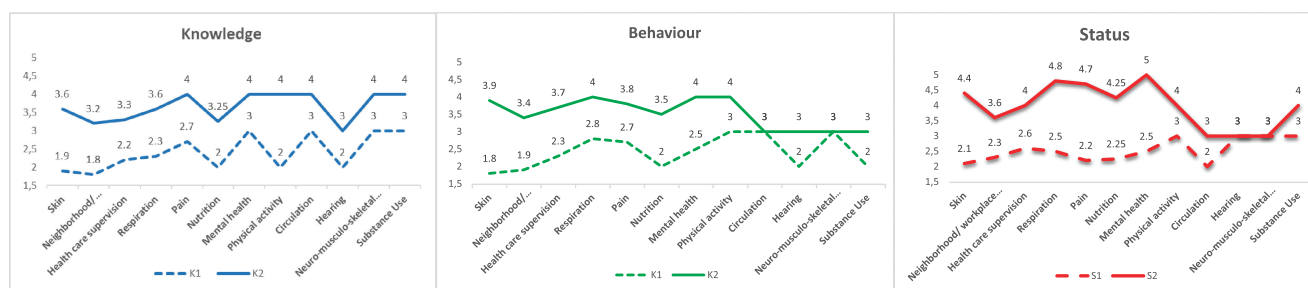


FIGURE 2. Mean KBS ratings at baseline and following intervention for all problems.

KBS by Participant

Multiple health problems were identified in each participant, and the mean differences in participants' overall KBS scores by participant were significant ($p < .001$; Table 1).

DISCUSSION

This study described occupational health nursing interventions and outcomes for hair stylist apprentices with HE who had numerous signs/symptoms. OHNs provided diverse interventions, after which participants showed improvement in outcome measures across several important health problems.

A recent study conducted by Lilly and Eldridge (2012) suggested that using health informatics can provide diverse and important advantages to improving dermatological outcomes for patients with skin disease symptoms. Use of the Omaha System in the current study enabled high-quality documentation through evidence-based care plans for hair stylists with HE, as well as the evaluation of nursing interventions. Because this is a pilot study, the results should be considered as preliminary findings that support further study; they are not intended to be actual population health measurements.

The *skin* problem was highly applicable in the OHN evaluation and monitoring of participants with symptoms

TABLE 1. Knowledge, Behavior, and Status Change Scores by High-Priority Problem of Hair Stylist Apprentices With Hand Eczema

Problem	PRSO Score Difference	<i>t</i>	<i>df</i>	<i>p</i>
Skin	K change score	1.73	11.309	.000*
	B change score	2.07	11.374	.000*
	S change score	2.27	10.990	.000*
Workplace safety/neighborhood	K change score	1.4	10.693	.000*
	B change score	1.5	11.000	.000*
	S change score	1.27	6.971	.000*
Health care supervision	K change score	1.1	11.000	.000*
	B change score	1.4	5.250	.001*
	S change score	1.4	8.573	.000*
Respiration	K change score	1.38	7.514	.000*
	B change score	1.25	3.989	.005*
	S change score	2.25	7.180	.000*
Pain	K change score	1.33	6.325	.001*
	B change score	1.17	7.000	.001*
	S change score	2.5	11.180	.000*
Nutrition	K change score	1.25	5.000	.015*
	B change score	1.5	5.196	.014*
	S change score	2	3.464	.041*
Mental health	K change score	1	3.462	.045*
	B change score	1.5	3.000	.025*
	S change score	2.5	5.000	.126

Note. PRSO = Problem Rating Scale for Outcomes; *t* = paired Student *t* test; *df* = degrees of freedom.

* $p < .05$ significant difference.

of HE (De Craecker et al., 2008; Flyvholm et al., 2002). Although this was expected, the study also identified additional health problems across all four Omaha System domains. This suggests that OHNs should conduct a comprehensive holistic assessment for this population to ensure the appropriate healthcare. The finding that participants had many health problems was surprising, as they exceeded the expected comorbidities described in the literature (Erdogan et al., 2013; Isci & Esin, 2009; Koseoglu-Ornek & Esin, 2015). This study found that the most common problems among the participants were *skin*, *neighborhood/workplace safety*, *health care supervision*, *respiration*, and *pain*. Hair stylists face many health problems, such as skin diseases and asthma, as a result of contact with chemicals, and they generally have negative working characteristics and conditions that can cause health problems (Aktas & Esin, 2016b; De Craecker et al., 2008; English et al., 2011). Therefore, the *neighborhood/workplace safety* problem (environmental domain) was likely to be identified in this study. The *health care supervision* problem (health-related behaviors domain) was the second most frequent problem. The results of this study agree with the findings of Thompson et al. (2012), who reported that the *health care supervision* problem was one of the most frequent problems in a vulnerable population (Thompson et al., 2012). Studies have shown that eczema is associated with allergic rhinitis and asthma, and hair stylists with HE are more likely to have respiratory problems (Kolena et al., 2017; Thompson et al., 2012). Similarly, in this study, participants had signs/symptoms categorized as *respiration* problems. It is known that patients with higher eczema severity scores have more pain complaints; therefore, the *pain* problem was expected (English et al., 2011; Yenigun et al., 2010). Although eczema is also thought to affect quality of life, in this study, the *mental health* problem (closely linked with quality-of-life measures) was found less frequently than in other studies (Kouris et al., 2015).

The finding that the vast majority of applied interventions were TGC (addressing insufficient knowledge about workplace risk) was consistent with previous studies (Martin, 2005; Monsen et al., 2013; Olsen et al., 2017). In OHN practices, health surveillance activities, which include assessment of workers' health data to monitor the health-related status of employees and to collect data on the health effects of hazardous exposures in the work environment, are the most crucial parts of the OHNs' interventions (Isci & Esin, 2009; Rogers, 2003). In this study, OHNs visited workplaces independently and monitored the hazards and risks in the workplace environment by conducting surveillance interventions. Similar to the findings of previous studies, the participants were examined by a dermatologist, and the OHN applied CM interventions to facilitate coordination and cooperation between the VCT authorities, families, and the dermatologist (Erdogan et al., 2013; Graves & Klein, 2016; Southard et al., 2017). In occupational healthcare units, nurses provide small treatments to the

workers, but activities requiring direct physician supervision are needed in some major situations. In this context, the OHN refers workers to physicians or well-equipped healthcare centers or hospitals (Isci & Esin, 2009; Rogers, 2003). In the current study, participants self-applied the treatment recommended by the dermatologist to whom they were referred by the OHN; therefore, no TP interventions were used, but OHNs followed the treatment process as health surveillance.

In this study, participant outcomes improved overall and by problem (Figure 2), indicating both the effectiveness of intervention and the capability of using the Omaha System to show improved outcomes in hair stylists with HE with respect to their knowledge about, behavior related to, and signs and symptoms of crucial health problems. One of the most important roles of the OHN and dermatology nurse is to ensure that interventions are recorded and that they lead caregivers to make the care plan visible (Isci & Esin, 2009; Rogers, 2003). Besides OHNs, dermatology nurses also have crucial roles in the clinical setting to provide accurate skin care to their patients and to improve skin health (Azima, 2016; Bobonich & Cooper, 2012). In addition, it is emphasized that the nurses have some difficulties assessing diagnosis, implementing care, and managing dermatological cases. Therefore, the use of standardizing methods and reliable tools or web-based records will improve primary care outcomes of patients (Klein et al., 2019; Lilly & Eldridge, 2012).

In this context, the Omaha System is convenient for healthcare providers and provides evidence for evaluation of care results. In addition, multidisciplinary healthcare providers and clinicians should understand the need to improve practice, documentation, and information management. If they use the Omaha System accurately and consistently, they can describe and improve the quality of their interventions and promote communication with healthcare team members, family members, and the public (Martin, 2005; Monsen et al., 2016; Strudwick & Hardiker, 2016).

Only a few studies have focused on occupational healthcare settings using the Omaha System. This study is one of the first to use the Omaha System to assess a young working population. The findings of this pilot study suggest that the use of the Omaha System may enable assessment of hair stylist health and documentation of occupational health nursing interventions and outcomes (Monsen et al., 2016).

CONCLUSION

An EHR-based Omaha System was used to document OHNs' assessments and interventions for hair stylists with HE. Using the Omaha System was a feasible method to evaluate the outcomes after intervention and to describe the skin problems and comorbidities of the young apprentices. This study examined changes after occupational health nursing interventions using all three components

of the Omaha System for a vulnerable population such as young workers.

The most important and visible benefits of using the Omaha System in occupational healthcare settings in specific cases (such as hair stylist apprentices with HE symptoms) will be the encouragement of the use of the EHR-based Omaha System in practice by OHNs, dermatology nurses, and other healthcare professionals. In addition, the Omaha System is an exceptionally useful EHR-based program for international use and can facilitate networking among nurses in different fields.

In future research, it is recommended that the Omaha System be used in different occupational healthcare areas for specific cases. Such studies could be remarkable and crucially important examples for occupational healthcare professionals, particularly nurses and dermatologists. This pilot study was limited to 15 participants who were not randomly selected, and therefore, the results cannot be generalized. The study should be replicated with a large sample size in occupational health data sets.

The use of an EHR-based Omaha System is suggested to support nurse professionals and other healthcare professionals in care planning, documentation, and evaluation of outcomes. ■

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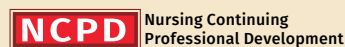
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