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

Short Title: Occupational Health Nursing Interventions for Eczema

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**ABSTRACT**

**The Omaha System is one of the most** [**applicable**](https://www.seslisozluk.net/applicable-nedir-ne-demek/) **classification systems and used effectively to recognize occupational health nursing (OHN) in practice.** Describing OHN interventions and outcomes by using Omaha System can be an example for planning care in a specific case such as hair stylish apprentices with hand eczema (HE) symptoms. The 15 cases were selected, and "Turkish-*Nordic Occupational Skin Questionnaire”* was used for data collection. The assessment was made by using elektronic health record system based on Omaha System. The interventions were coded to the Omaha System standard categories which were *Teaching, Guidance, and Counseling (TGC), Surveillance (S), Case Management (CM), and Treatment/Processing (TP).* For the 15 cases, 113 problems and 624 nursing interventions were reported, and the most common problems determined were Skin (100%), Neighborhood/workplace safety (100%), Health care supervision, Respiration, and Pain; and the identified intervention categories were 98.5*%* about TGC, 89.2*%* about HS, and 6.4*%* about CM. The OHN outcomes scores were more likely to show higher level after the intervention (p<.05). The Omaha System can be effectively used in occupational health care settings for specific cases in workplaces.

***Key words:*** Omaha System, occupational skin diseases, hairdressers, hair stylists, apprentice, young worker, hand eczema, occupational health nurse, case study, electronic health record

**INTRODUCTION**

Occupational skin diseases (OSDs) are one of the most frequently observed occupational diseases in many countries. They usually occurs due to contact with allergens and irritating substances in the workplace. In particular, hand eczema (HE) comprises nearly 90*%* of all OSD symptoms [1,2]. HE is an important health issue in those working as [hairdressers,](https://www.dermnetnz.org/topics/skin-problems-in-hairdressers-and-barbers/) hair stylists and barbers. The occupational activities of hair stylists are classified as risky in terms of HE since 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 [1-3].

According to the International Labor Organization (ILO), 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.4 In addition, young working issues are considered to be among the most important issues in many developing countries, as well as in Turkey [5-8].According to the European Occupational Diseases Statistics(2005), HE is the second-most common occupational disease in young workers.1 In Turkey, young workers enroll at Vocational Training Centres (VCTs) and generally prefer to study hairdressing/hair styling as apprentices. In Turkey, the number of studies about OSD symptoms in apprentice hair stylists is very limited, and generally, these studies did not use standardised methods or tools for intervention [7,9-11].

Occupational health care teams consist of [doctors](https://app.croneri.co.uk/topics/occupational-health-team-roles/indepth#DCAM-3081784), [nurses](https://app.croneri.co.uk/topics/occupational-health-team-roles/indepth#DCAM-3081788), occupational [hygienists](https://app.croneri.co.uk/topics/occupational-health-team-roles/indepth#DCAM-3081794), [health and safety practitioners](https://app.croneri.co.uk/topics/occupational-health-team-roles/indepth#DCAM-3081795), occupational therapists and sometimes physiotherapists and ergonomists. Occupational health nurses (OHNs) are at the frontline in planning healthcare interventions to promote the health status of working populations [12-14]. Nurses should provide standardised and high-quality care for vulnerable populations and patients in order to improve their health outcomes. In recent years, it has been crucial to use a standardised terminology among nurses to objectively evaluate the contributions of nurses to the care of patients, families and communities in order 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. It is used to describe nursing activities in research and practice, allowing the objective evaluation of nursing interventions in a standardised and electronic health record (EHR)-based manner [15-18].

Today, there are many standard nursing languages and terminologies developed and used by nurse researchers around to world to outline nursing care. The most common terminologies include the North American Nursing Diagnosis Association (NANDA) taxonomy, the Nursing Interventions Classification (NIC) and the Nursing Outcome Classification (NOC), which are used to describe nursing diagnoses, interventions and outcomes, respectively [19]. Among the many terminologies and classification systems, the Omaha System is one of the most comprehensive and is used in multidisciplinary settings [15-17] .

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 OHN 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 standardised terminology that is based on the EHR. Therefore, this study provides valuable information for OHNs and other healthcare professionals [12-14].

**The Omaha System**

The Omaha System is one of the oldest standardised terminologies and was developed by multidisciplinary researchers and health practitioners. Research to develop the Omaha System began at the Visiting Nurse Association (VNA) 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 for individuals, groups and communities; school health; education of nursing students and many other clinical settings. Among all of the standardised nursing terminologies recognised by the American Nurses Association, the Omaha System is considered the most important terminology in data collection and measuring and reporting the outcomes and impact of healthcare services in accordance with current EHR systems. Therefore, the Omaha System contributes to the visualisation of healthcare professionals’ evidence-based practices. The codes of the Omaha System are very well designed and are applicable to all individuals, families and communities of all ages, socio-demographic and socio-economic statuses, medical diagnoses, ethnicities, spiritual beliefs and cultural values [20-26]. The Omaha System was translated and adapted into Turkish language by Erdogan *et al*., and it has been used in Turkey in research and nursing student education settings as a valid and reliable tool since the 1990s[27-30].

The Omaha System comprises three integrated components:the Problem Classification Scheme (PCS) for assessment of care and classifying patient health problems*,* the Intervention Scheme (IS) for describing the interventions, and the Problem Rating Scale for Outcomes (PRSO)to evaluate the outcomes and measure the impact of health care[15,25]. The PCS includes 42 problems that are categorised 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 IS 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 PRSO is the final step in evaluating the clients’ care processes and measuring the outcomes. It uses a five-point Likert scale to rate knowledge (what the client knows about the problems), behaviour (whether the client/care providers practice appropriately) and status (the client’s health status and whether there is any change)[15-17].

 The Omaha System is a standardised nursing terminology used to code evidence-based practice, facilitate data capture and assess the data. 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 standardise clinical data, examine the quality of care and generate globally comparable outcome reports. In this context, EHR based on 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 [15-17,25].

In Turkey, the Omaha System has been used mainly in public health, community health, school health, occupational health, nursing home care, nursing education and research for master’s and doctoral theses. Although the Omaha System has been used in an international Turkish company for occupational healthcare and safety services, its use in occupational healthcare settings is very limited.13 In recent decades, the Omaha System has been [officially](https://www.seslisozluk.net/en/what-is-the-meaning-of-officially/) set as an EHR program adapted to the software in Turkey. In the assessment of OSDs 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 in order 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 OHN 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, which may help make OHN care more visible.

From the outset, the following research questions were formed: (1) Is the Omaha System suitable in occupational health nursing care settings for specific cases such as hair stylist apprentices with HE symptoms? and (2) What are the most common problems, intervention categories, targets and interventions for hair stylist apprentices with HE symptoms when using the Omaha System?

**METERIALS AND METHODS**

**Sample and Design**

The study design is The descriptive longitudinal study. The study was conducted at a VCT where apprentice hair stylists were trained and received apprenticeship certificates after graduation. All hair staylists classes at the VCT were completed a reliable and self-administered questionnaire to define occupational skin diseases and related factors. At the same time, they were examined by an occupational physician specialising in skin diseases. After the assessment 101 apprentices were diagnoized with different kind of low skin dissesas symptoms, and 15 of them were found suffered from severe scores of HE symptoms on their hands and forearms since starting their apprenticeships; and they were refered to the dermotology clinics for treatment.

S**ample:**The participants included 15 apprentice hair stylists with severe scores of hand eczema (HE) symptoms such as itching, cracking, rash, redness and dryness. Written consent form was obtained prior to enrollment in the study.The occupational health nurse (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 occupational skin disease symptoms and related factors. To decribe common health problems accompanying skin problems of hairstylists apprentices diagnosed with HE, Omaha System was used. The three components of the Omaha System – the problem classification scheme , intervention scheme and problem rating scale for outcomes – for nurses were used for outcomes. The assessment was made using a Turkish electronic health record, based on the Omaha System, called Nightingale Notes Software. The paticipants were informed about the study process. Based on the Omaha System, the interventions of the OHN were evaluated to appropriate categories, TGC, TP, CM and S.

Firstly, the T-NOSQ was applied to hair stylists classes to determine the self-report severity of the occupational skin didsease symptoms and related factors. The apprentices who self-reported to have s occupational skin disases symptoms based on T-NOSQ (N=101), the occupational physician examined these students in the terms of HE symptoms severity. The 15 apprentices identified at high risk group for HE symptoms were referred to a dermatology service. These appantices were imcluded into the study and their health care needs were began to assesed and monitored by using the Omaha System components. The OHN monitored and visited the apprentices for three months, and applied the intervention at the VCT’s infirmary. The intervention was applied monthly for a three-month period, with each visit lasting two 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 (T-NOSQ)**

The NOSQ was created as a self-report and reliable tool in English by the Nordic Working Group to evaluate occupational skin disease symptoms. The NOSQ includes 57 questions which are grouped into 10 different coded dimensions related to factors affecting occupational skin disease symptoms [3,31]. 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 [32]. To define the occupational skin diseases symptoms; ***Question D1*** *and* ***Question******D2***were used in the T-NOSQ in this study.

**Omaha System within Electronic Health Record System: Nightingale Notes**

Nightingale Notes (NN; Champ Software Inc., North Mankato, MN, USA) was the EHR system used for entering health records and data reporting based on the Omaha System’s three components [33].

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 customisable 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 using in USA in many public health departments to provide high quality care to individuals/ family/ communities. It is a web-based electronic registration system that allows to record nursing care. It increase quality of care by using evidence-based care guidelines (road maps) in nursing practice, and evaluates effectiveness of nursing practices. Also, it provides to analyze of care plans that based on Omaha System components ensures that research initiatives and research 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 patient at individual, family and community level [28,33].

**Ethics and approval**

Ethics committee approval was obtained from the Ethics Board Commission of the Medipol University (Date:09/10/2015; Approval Number: 479; 10840098-604.01.01-E.2744). 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 format from the system. The CSV files were imported into Excel (Microsoft, Redmond, WA) and analyzed in SPPS 21.0 (IBM Corporation, Armonk, NY, USA). Standard descriptive and inferential statistics were employed to address the study aims. Statistical significance was set at *p*<0.05 a priori.

**RESULTS**

The participants’ mean age was 24±2.3. The majority (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.

Based on 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 (PPE) 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 *Neighbourhood/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 *Neighbourhood/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. The majority 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 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).



**Figure 1- Data Visualization of Interventions by Problem, Category, and Target for Hair Stylists Apprentices with Hand Eczema**

***Knowledge, Behavior, and Status Outcomes***

***KBS by Problem (KBS):*** 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 *Neighbourhood/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 behaviour scores were lowest for the *Skin* problem (1.8) and highest for the *Pain* problem (2.7). The final behaviour scores were lowest for the *Neighbourhood/workplace safety* problem (3.4) and highest for the *Respiration* problem (4). The greatest increase in behaviour scores was seen for the *Skin* problem. (Figure- 2). Furthermore, the use of PPE, 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 *Neighbourhood/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).

|  |
| --- |
| **Table -1 : KBS Change Scores of Each Clients** |
| **Problem** | **PRSO Score diffrence** | **t** | **df** | **p** |
| **Skin** | **K change score** | 1.73 | 11.309 | 14 | 0.000\* |
| **B change score** | 2.07 | 11.374 | 14 | 0.000\* |
| **S change score** | 2.27 | 10.990 | 14 | 0.000\* |
| **Workplace Safety/ Neighborhood** | **K change score** | 1.4 | 10.693 | 14 | 0.000\* |
| **B change score** | 1.5 | 11.000 | 14 | 0.000\* |
| **S change score** | 1.27 | 6.971 | 14 | 0.000\* |
| **Health care supervision** | **K change score** | 1.1 | 11.000 | 9 | 0.000\* |
| **B change score** | 1.4 | 5.250 | 9 | 0.001\* |
| **S change score** | 1.4 | 8.573 | 9 | 0.000\* |
| **Respiration** | **K change score** | 1.38 | 7.514 | 7 | 0.000\* |
| **B change score** | 1.25 | 3.989 | 7 | 0.005\* |
| **S change score** | 2.25 | 7.180 | 7 | 0.000\* |
| **Pain** | **K change score** | 1.33 | 6.325 | 5 | 0.001\* |
| **B change score** | 1.17 | 7.000 | 5 | 0.001\* |
| **S change score** | 2.5 | 11.180 | 5 | 0.000\* |
| **Nutrition** | **K change score** | 1.25 | 5.000 | 3 | 0,015\* |
| **B change score** | 1.5 | 5.196 | 3 | 0,014\* |
| **S change score** | 2 | 3.464 | 3 | 0,041\* |
| **Mental Health** | **K change score** | 1 | 3.462 | 1 | 0.045\* |
| **B change score** | 1.5 | 3,000 | 1 | 0.025\* |
| **S change score** | 2.5 | 5,000 | 1 | 0.126 |

**p<0.05 stattistically significance**



**Figure 2- Mean KBS Ratings at Baseline and Following Intervention for All Identified 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<0.001) (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. Use of the Omaha System 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 of HE [1,3].While 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 in order to ensure the appropriate health care. The finding that participants had many health problems was surprising, as they exceeded the expected co-morbitites decribed in the literature [13,14, 30].This study found that the most common problems among the participants were *Skin*, *Neighbourhood/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 [1,9,34]. Therefore, the *Neighbourhood/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.35 Studies have shown that eczema is associated with allergic rhinitis and asthma, and hair stylists with HE are more likely to have respiratory problems [1,8,9,12,35]. Similarly, in this study, participants had signs/symptoms categorised as *Respiration* problems. It is known that patients with higher eczema severity scores have more pain complaints; therefore, the *Pain* problem was expected [11,34].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 [1,3,8,10,12].

The finding that the vast majority of applied interventions were TGC (addressing insufficient knowledge about workplace risk) was consistent with previous studies[15,21,23]. 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[12-14].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 co-operation between the VCT authorities, families and the dermatologist [12,13, 21,30 ,36]. 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, OHN refers workers to physicians or well-equipped healthcare centers or hospitals [12,14]. 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 the present study, participant outcomes improved overall and by problem (Figure-2); demonstrating 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, behaviour related to and signs and symptoms of crucial health problems. One of the most important roles of the OHN is to ensure that interventions are recorded and that they lead caregivers to make the care plan visible[12,13]. 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[15, 18, 37].

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 OHN interventions and outcomes [18].

**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 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 and other healthcare professionals. In addition, the Omaha System is an exceptionally useful EHR-based program for international use and can facilitate networking among OHNs.

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

**Study Limitations**

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 large sample size in occupational health data sets.

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