

Evaluation of the Effect of Nursing Services Provided in a Correctional Institution on the Physical Health Levels and Health Behaviors of Female Inmates

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Abstract—Female inmates placed in a Correctional Institution (CI) have more physical health problems than other women and their male counterparts. Thus, they require more health care services in the CI and nursing services in particular. CI nurses also have the opportunity to teach behaviors which will protect and improve their health to these women who are difficult to reach in the community. The aim of this study was to evaluate effect of nursing services provided in a CI on the physical health levels and health behaviors of female inmates. The study has a quasi-experimental design. The study was done in Female Closed CI in Ankara, Turkey. The study was conducted on 30 female inmates. Before the implementation of nursing interventions in the initial phase of the study, female inmates were evaluated in terms of physical health problems and health behavior using forms, a physical examination, medical history, health files (file containing medical information related to prisons) and the Omaha System (OS). Findings obtained from evaluations were grouped and symptoms-findings were expressed with OS diagnosis codes. Knowledge, behavior and status scores of prisoners in relation to health problems were determined. After the implementation of the nursing interventions, female inmates were evaluated in terms of physical health problems and health behavior using OS. The research data were collected using the Female Evaluation Form developed by the researcher and the OS. It was found that knowledge, behavior and status scores of prisoners significantly increased after the implementation of nursing interventions ($p < 0.05$).

Keywords—Correctional institution, correctional nursing, prison nursing, female inmates, physical health problems, health behaviors.

I. INTRODUCTION

THE majority of female inmates, a number of women growing in both in Turkey and around the world, are from socially, economically and culturally disadvantaged groups [1]. Female inmates, who have high risks in terms of health, are members of a group which is difficult to reach outside CIs [2]. Studies show that these women have chronic [3] and complex health problems before being placed in CIs for reasons such as poverty, substance abuse, domestic violence, sexual abuse, adolescent pregnancy, malnutrition and unhealthy lifestyle [4], [5]. When the negative effects of CIs (crowdedness, isolation of individuals, problems related to violence, etc.) are added to the negative effects of their past lives on their physical and mental health [6], the number of health problems experienced by these women increases [7]. They have health problems such as substance abuse, infectious diseases, violent crimes, mental health disorders, chronic

diseases and reproductive health problems [8]. It has been reported that their physical health is negatively affected and they experience more health problems during their stay in CIs [6]. Chronic diseases are seen more frequently compared to the general population [9] and their physical health is worse than other individuals in society [10]. Oral and dental health problems and problems related to substance abuse are seen more commonly in inmates [11]. Cervical cancer in particular [9], as well as asthma, diabetes, malnutrition, insufficient exercise and smoking are seen more commonly in female inmates compared to other women in society [12]. Past life experiences, an inability to access health care services [3] and inadequate healthy behavior [12] are considered to be among reasons behind the increase in health problems experienced by female inmates after being placed in CIs. CIs present a unique opportunity to improve their health level and provide health care services for these women, who receive insufficient medical care and have high-risk health behavior. Individuals in CIs usually reach health services through nurses [13]. Nurses constitute the backbone of health services in these institutions [14]. The aim of the study was to evaluate the effects of nursing services on the physical health levels and health behaviors of female inmates.

II. METHODS

A. Materials and Methods

The study has a quasi-experimental design. The universe of the study is made up of 216 female inmates placed in the Female Closed Correctional Institution, Ankara (FCCIA) between 01 January 2011 and 31 December 2011. The sample size of the study was determined using G*Power 3.1.8 software and 30 female inmates who accepted to participate in the study were included in the sample. An increase of 0.5 [15] in average knowledge, behavior and status scores after the implementation of nursing interventions was accepted to be significant and it was found that the optimum sample size was at least 29 participants assuming a standard deviation of 0.6 and $\alpha = .01$ and Power = .95.

One third (30.0%) of the female inmates who participated in the study were in the 35-39 age group, half (50.0%) were primary school leavers, literate or illiterate, more than a quarter were (26.7%) were divorced and more than half (58.3%) had 1 or 2 children. Three-fifths (60.0%) of female inmates had been placed in CI due to offences against persons (murder, injury (injury someone), assault (attack someone)

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etc.). The mean term of sentence was 198.13 ± 142.78 (months) and the mean term in CI was 42.00 ± 34.29 (months).

The necessary permit was obtained from the General Directorate of Prisons and Detention Houses of the Ministry of Justice and ethical approval was obtained from the Research Assessment Authority and Ethics Committee of Hacettepe University (Institutional Review Board Date: 2012 February 29, and Institutional Review Board Number: 431-1132). The study was conducted in accordance with 'The Code of Ethics' of the World Medical Association (Declaration of Helsinki). The purpose of the research was explained to all women included in the study group. Participation was on voluntary basis. The participants were assured that all personal information would be kept confidential and written informed consent was obtained from each participant. This study was evaluated with Turnitin Programs and approved by Hacettepe University.

The Female Evaluation Form which was developed by the researcher and the OS was used in order to collect data. The Female Evaluation Form prepared by the researcher included socio-demographic characteristics and introductory information. The OS was developed by the Visiting Nurse Association (VNA) and began to be used in the United States in 1970s [16]. The system was adapted into Turkish and began to be used in public health nursing training by Erdoğan and Esin in 2004. The system was tested for validity and reliability by Erdoğan and Esin in 2006 [17]. The OS consists of three parts: Problem Classification Scheme (PCS), Intervention Scheme (IS) and Problem Rating Scale for Outcomes (PRSO).

1. **Problem Classification Scheme** includes an individual-oriented nursing diagnostic in four diagnostic domains: environmental, psychosocial, physiological and health-related behaviors. There are a total of 42 problems in these domains and each domain contains standard cues and clues and also an "other" option [17]. Considering the purpose of the study, physiological and health-related behaviors domain were used in this study.
2. **Problem Rating Scale for Outcomes** is a five-point, Likert-type scale that measures the level of problem and evaluates care results. It evaluates dimensions of "knowledge", "behavior" and "status" with a single score from 1 to 5 [17]. PRSO was used twice in the study for the initial evaluation and the final evaluation.
3. **Intervention Scheme** provides a list of nursing interventions, targets and individual-specific interventions. Nursing intervention categories are Teaching, Guidance and Counseling (TGC); Treatments and Procedures (TP); Case Management (CM); and Surveillance (SV) [17].

The pilot study was performed with 10 female inmates who had one week left in FCCIA as of 25 August 2011. After the pilot study, necessary corrections and revisions were made to the data collection forms and it was found that forms took 45-60 minutes on average to complete. The study was conducted between 01 September 2011 and 28 December 2012. First, the participants were evaluated in terms of physical health problems using the forms generated, a physical examination,

medical history, health files (file containing medical information related to prisons) and OS. OS diagnosis codes were adopted in order to express symptoms-findings and to group findings obtained from evaluations. Knowledge, behavior and status scores of prisoners in relation to health problems were detected. The process continued with determination of targets related to diagnosis and planning of interventions. Nursing interventions aimed at the participants' problems were planned according to teaching, guidance and counseling; treatments and procedures; case management; and the surveillance (follow up someone or population) categories in the intervention scheme. Although the study had a specific target related to physical health problems and health behaviors, other health problems identified in the participants were not ignored and the necessary counseling and cooperation were provided to solve said problems.

The statistical analysis of the data was performed with a statistical package program. The statistical significance level was accepted to be $p < .05$. Number, Mean, Standard Deviation, Median, Minimum and Maximum were used for descriptive statistics related to the continuous data. The discrete data were presented as numbers and percentages. The comparison of the number of problems found with physiological health and health behavior before and after the implementation of nursing interventions was made with the McNemar Test. The comparison related to the change in each problem found with physiological health and health behavior after the implementation of nursing interventions in terms of knowledge, behavior and status scores according to OS was made with the Wilcoxon Signed Rank Test.

III. RESULTS

A total of 319 nursing diagnoses/problems were encoded in the study. 56.4% of these diagnoses were problems related to the physiological domain, whereas 43.6% were problems related to the health-related behaviors domain.

In the study, a total of 180 (56.4%) nursing diagnoses related to physiological domain were found in the initial evaluation, whereas a total of 178 (58.4%) nursing diagnoses were found in the final evaluation. The distribution of diagnoses related to the physiological domain was as follows: oral health (n: 29, 16.1%), digestion-hydration (n: 23, 12.8%), reproductive function (n: 19, 10.6%) and circulation (n: 19, 10.6%). It was noteworthy that there were participants with more than one physical health problem (Table I). Diagnoses made in the final evaluation were as follows: oral health (n= 29), digestion-hydration (n= 22) pain (n= 20), respiration (n= 19) and reproductive function (n= 17) (Table I). No difference was found between any nursing diagnoses related to physiological domain in the initial evaluation and the final evaluation ($p > .05$).

From the most common to the least common, the distribution of diagnoses related to health-related behaviors domain made in the initial evaluation and the final evaluation was as follows: nutrition, health care supervision, physical activity and substance abuse (Table II). An average of 4.6 problems related to the health-related behaviors' domain were

identified per participant. Problems in multiple categories of the health-related behaviors' domain were identified in participants. No difference was found between any nursing diagnoses related to the health-related behaviors' domain in the initial evaluation and the final evaluation ($p>.05$).

TABLE I
DISTRIBUTION OF FEMALE INMATES' NUMBER OF NURSING DIAGNOSES RELATED TO THE PHYSIOLOGICAL DOMAIN IN INITIAL AND FINAL EVALUATIONS

Nursing Diagnoses	Initial Evaluation	Final Evaluation	McNemar Test, p
	(n=30) n (%)*	(n=30) n (%)*	
Oral Health	29 (96.7)	29 (96.7)	1.000
Digestion-Hydration	23 (76.7)	22 (73.3)	1.000
Circulation	19 (63.3)	17 (56.7)	.727
Reproductive Function	19 (63.3)	17 (56.7)	.625
Respiration	17 (56.7)	19 (63.3)	.500
Pain	17 (56.7)	20 (66.7)	.250
Vision	14 (46.7)	12 (40.0)	.500
Urinary Function	13 (43.3)	12 (40.0)	1.000
Bowel Function	11 (36.7)	13 (43.3)	.687
Hearing	9 (30.0)	6 (20.0)	.250
Skin	5 (16.7)	5 (16.7)	1.000
Communicable/Infectious Condition	3 (10.0)	5 (16.7)	.625
Neuro-Musculo-Skeletal Function	1 (3.3)	1 (3.3)	1.000

* Percentages were calculated using n.

TABLE II
DISTRIBUTION OF NUMBER OF NURSING DIAGNOSES RELATED TO THE HEALTH-RELATED BEHAVIOR DOMAIN MADE IN THE INITIAL AND THE FINAL EVALUATION

Nursing Diagnoses Related to Health-related Behavior Domain	Initial Evaluation	Final Evaluation	McNemar Test, p
	(n=30) n (%)*	(n=30) n (%)*	
Nutrition			**
Health care supervision	30 (100.0)	30 (100.0)	.250
Physical activity	29 (96.7)	28 (93.3)	1.000
Substance use	23 (76.7)	22 (73.3)	1.000
Sleep	19 (63.3)	14 (46.7)	.180
Medication regimen	8 (26.7)	6 (20.0)	.500

* Percentages were calculated using n. ** No statistical analysis was possible due to occurrence in all participants.

There was a difference between median knowledge scores related to the physiological domain found in the initial and the final evaluation ($p<.001$). There was a difference between median behavior scores related to the physiological domain found in the initial evaluation and the final evaluation ($p<.001$). There was a difference between median status scores related to the physiological domain found in the initial evaluation and the final evaluation ($p<.001$) (Table III).

There was a difference between median knowledge scores related to the health-related behaviors' domain found in the initial evaluation and the final evaluation ($p<.001$) (Table IV). There was a difference between median behavior scores related to the health-related behaviors' domain found in the initial evaluation and the final evaluation ($p<.001$). There was a difference between median status scores related to the

health-related behavior domain found in the initial evaluation and the final evaluation ($p<.001$) (Table IV).

TABLE III
DISTRIBUTION OF KNOWLEDGE, BEHAVIOR AND STATUS SCORES OF FEMALE INMATES RELATED TO PHYSIOLOGICAL DOMAIN FOUND IN THE INITIAL AND THE FINAL EVALUATION

PRSO Sub-Dimensions	Initial Evaluation		Final Evaluation		Wilcoxon Signed Rank Test, p
	M±SD	Median (Min-max)	M±SD	Median (Min-max)	
Knowledge score	1.50±0.54	1.3(1-3)	2.04±0.58	1.9(1.1-3.5)	.001
Behavior score	1.40±0.49	1.2(1-3)	2.18±0.85	2.0(1-4.5)	.001
Status score	2.90±0.39	2.9(2-3.7)	3.41±1.27	3.3(1.7-8)	.025

TABLE IV
DISTRIBUTION OF KNOWLEDGE, BEHAVIOR AND STATUS SCORES OF FEMALE INMATES RELATED TO THE HEALTH-RELATED BEHAVIOR DOMAIN FOUND IN THE INITIAL AND THE FINAL EVALUATION

PRSO Sub-Dimensions	Initial Evaluation		Final Evaluation		Wilcoxon Signed Rank Test, p
	M±SD	Median (Min-max)	M±SD	Median (Min-max)	
Knowledge score	1.80±0.48	1.7(1-2.8)	2.42±0.78	2.2(1.25-4)	.001
Behavior score	1.35±0.44	1.2(1-2.33)	2.13±0.98	1.9(1-5)	.001
Status score	3.20±0.56	3.2(2-4)	3.79±1.14	3.7(1.6-7.3)	.005

IV. DISCUSSION

It was found in the study that the number of problems related to the physiological domain was higher than the number in the health-related behavior domain. This finding is consistent with the data that individuals placed in CIs, women in particular, have more physical health problems [18]. Also, the average of 6 physical health problems found per participant in this study is consistent with the data in the literature, which has an average of 6.3 physical health problems per inmate [6].

Diagnoses related to oral health, digestion-hydration, reproductive function and circulation stood out in the physiological domain (Table I). It is known that individuals in CIs have inadequate oral health practices and female inmates in particular have a higher prevalence of tooth decay, loss and fillings [19]. A lack of oral and dental health, as a part of general health, may lead to heart-circulatory diseases, diabetes, pneumonia, chronic respiratory diseases, gastrointestinal diseases, orthopedic diseases, psychosomatic diseases, low birth weight and high miscarriage risk in pregnant women. Correctional nurses should remember that training they provide related to oral health, which will constitute a starting point in oral health services, will directly influence public health. Upon the diagnosis of euthyroid goiter or thyroiditis, which are not included in the oral health symptoms section in the OS, the symptom 'finding of growth in the thyroid gland' was added as "other" to the oral health category. Mouth sores and swelling of lymph node were also added as "other" to the oral health category.

Another nursing diagnosis category in female inmates was circulation. The most common symptoms and findings observed under this category were abnormal blood pressure measurements, heart rhythm disorder, chest pain and excessive

increase in heart rate. Math et al. [20] found that although most women do not report a history of hypertension history when they are initially placed in a CI, the percentage of individuals with hypertension found as a result of examinations (20.5%) is higher than that individuals reporting a history of hypertension (3.6%). In the present study, the number of inmates with hypertension was 3 in the initial evaluation, whereas the number of inmates with hypertension was 5 in the final evaluation.

Another nursing diagnosis category in female prisoners was reproductive health (Table I). Symptoms-findings of this category include abnormal menstruation, abnormal discharge and mass, swelling and tenderness in breast. We identified mass, swelling and tenderness in reproductive organs or the breast of one participant who was later diagnosed with advanced stage (stage IV) metastatic breast cancer. 2 women with early menarche, 6 women with hereditary risk factors and 17 overweight women were identified in the study, which indicates that these women were in a high-risk group in terms of breast cancer.

It has been reported that a quarter of women in a CI were diagnosed with vaginitis (in 170 women) and almost half had Sexually Transmitted Diseases (STDs) [21]. It was found in the present study that 11 women were diagnosed with vaginitis and 1 woman was HIV positive. An investigation of the causes of the vaginitis showed that almost all of these women had incorrect toilet and menstruation hygiene practices. It is known that women in CIs and women in society have similar practices in terms of cleaning the genital area, washing hands after using the toilet, frequency of changing underwear, using sanitary pads, meeting the need for pads, frequency of replacing pads, washing hands before and after replacing pads, showering during menstruation. However, being in a CI negatively influences certain hygiene practices of the women [22]. Since female prisoners are known to carry out wrong hygiene practices which are commonly seen in wider society interventions on women in CIs should be considered as interventions on the entire society. All personal hygiene practices were presented to female prisoners in training held within the scope of the study. It has been reported that the majority of reproductive health problems observed in the study are common problems of all women [20]. For this reason, the provision of health services related to reproductive health is believed to be of great importance for protecting and improving women's health. Also, it should be remembered that the provision of protective services aimed at reproductive health will be a cost-effective approach.

Being infected with HIV is 8 to 10 times more common in prisoners compared to free individuals. This rate is 9 to 10 times for Hepatitis C and 4 to 17 times for Tuberculosis (TB) [8]. 3 participants were diagnosed with a communicable/infectious condition in the study (Table I). Only a single participant was diagnosed with HIV. Another participant was known to be HIV positive prior to the study. Individuals are not examined for HIV, Hepatitis and TB upon being placed in a CI, which leads to the idea that the absence of this practice may lead to the spread of said diseases. The participant who

was found to be HIV positive was in the CI for 3-4 months. Considering the presence of diseases of this nature, performing examination upon entrance to CI is believed to be a cost-effective approach, since HIV treatment is quite expensive and the spread of HIV to other individuals in CI will bring costs far beyond the cost of the test to the national economy.

In terms of health-related behaviors' domain, female inmates in CI had problems related to following: nutrition, health care supervision, physical activity, substance abuse, sleep and adhering to a medication regimen. The symptom-finding related to inadequate preparation of food is a problem solely related to insufficient opportunities and conditions provided in CIs. Women report that nutrition in CIs is poor and rich in carbohydrates, food choice is limited, dishes are unpleasant and badly cooked and only a small minority of female inmates report that they consume sufficient amounts (at least 3 times a day) of fruit and vegetables [12]. Nutrition was found to be one of the most important obstacles to the protection and promotion of female inmates' health. Considering that malnutrition negatively affects mental health as well, it can be said that both the physical and mental health of female inmates are under risk.

One of the most important categories in the health-related behaviors' domain was health care supervision (Table II). Symptoms-findings under this category are not receiving care for symptoms requiring evaluation/treatment, not receiving routine/protective health care, insufficient health care resources, inadequate treatment plan, unsustainable health care resources and failure to attend appointments (Table II). It has been reported that women in Turkish society have a low level of health responsibility [23]. The fact that female inmates in the study were found to have a low level of health responsibility explains the nursing diagnoses made in the health care supervision. In particular, the fact that most female inmates have limited access to health care services prior to being placed in a CI, have limited knowledge about personal health and a low level of awareness related to a healthy lifestyle influence their lack of access to services to protect their health. For this reason, CIs may play an important role in public health during the term of sentence and after the women's release. It is of great importance to provide health services, especially primary and secondary preventative health services, for inmates upon entrance to CIs. At this point, the most important role belongs to nurses working in CIs. Indeed, studies show that women in CIs have less cervical screening and mammography compared to the general population [24] and have inadequate health protecting behaviors such as breast self-examination [12]. Baldwin and Jones [25] highlight that protective programs and primary health care services aimed at women (such as physical activity, family planning and health training), early diagnosis, screening and treatment services (such as screening and treatment for STDs, smoking cessation treatment and antenatal care) should be provided for women in accordance with professional standards and with quality assurance [25]. Provision of services related to birth control methods for female inmates is considered by CIs as an

important community health intervention aimed at traditionally marginalized communities.

Another category under the health-related behaviors category was smoking/use of tobacco products (n= 23) (Table II). It was found that the participants had problems related to alcohol and substance abuse prior to being placed in CI. The findings of the present study are consistent with the data that women in CIs have a higher rate of smoking compared to women in the general population [26]. The said finding is also consistent with the data in the worldwide literature [12]. When substance abuse is not treated in a CI, the possibility of relapse in order to finance the addiction usually increases. Criminality continues and grows with drug-related crimes, theft or prostitution [27]. In a study conducted by Kane and DiBartolo [21] with 30 women in a CI, it was found that 13 women had substance dependence prior to their arrest and 16 continued to use alcohol after their release. 25.0% of prisoners were found to be alcoholics and more than half of these prisoners were reported to be inebriated when committing the crime [21]. Because alcohol and/or substance abuse is reported to be directly associated with committing crimes, they mutually influence each other and cause very serious social, economic and medical problem; individuals in CIs with substance abuse issues are known to experience different related health problems than general health problems. For this reason, substance withdrawal should be considered as a serious health issue upon the first week of entrance to CI [28]. Correctional nurses should evaluate, familiarize themselves with, treat and educate all prisoners with regard to substance abuse during the first week of entrance to CI. It is of great importance to create the opportunities provided by CIs as centers for the diagnosis and treatment of alcohol and substance abuse [28].

Nursing interventions created a statistically significant increase in knowledge, behavior and status scores in the physiological domain (Table III). It was found in other studies conducted in different areas with the OS that nursing interventions also led to an increase in knowledge, behavior and status scores [29], [30]. The increase in status scores of female inmates indicates an improvement in their health level. This increase demonstrates the positive effect of nursing interventions on female inmates' health levels.

The median knowledge and behavior scores related to the nutrition, physical activity and health care supervision categories under the health-related behavior domain found in the final evaluation showed a significant increase compared to the median knowledge and behavior scores found in the initial evaluation ($p < .05$), however there was no change in the median status score ($p > .05$) (Table IV). This might be due to inadequate facilities and negative conditions in CIs despite the increase in knowledge and behavior scores. Inadequate health care measures in CIs, shortcomings in hygiene practices, limitations in food-beverage services, accommodation, heating, lighting, ventilation and physical activity facilities are known to affect individuals' status.

V. CONCLUSION

It was seen that nursing services provided in CIs had positive and significant effects on women's health behaviors and physical health levels. In order to ensure that women return to the society healthier and with more positive health behaviors, physical health problems and health behaviors should be comprehensively evaluated by nurses on entrance to CI and on a regular basis thereafter. It is also recommended that health-related training, counseling, screening, treatment and rehabilitation are provided for female prisoners.

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