ORIGINAL ARTICLE

EFFECTS OF HEALTHY EATING HABITS AND DIET QUALITY ON QUALITY OF LIFE AND JOB PERFORMANCE IN MIDDLE-AGED (45-65) HEALTHCARE WORKERS

Sağlık Kurumlarında Çalışan Orta Yaş (45-65) Personelinin Sağlıklı Yeme Alışkanlıkları ve Diyet Kalitesinin Yaşam Kalitesi ve İş Performansı Üzeri

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ABSTRACT

Objective: Job performance (JP) among healthcare workers is vital for patient safety and the overall efficiency of healthcare services. Research exploring how dietary habits and quality of life influence JP in healthcare workers remains limited. This study aimed to assess the impact of healthy eating habits, diet, and quality of life factors on JP in middle-aged healthcare workers.

Material and Methods: A total of 333 healthcare workers took part in the study. The study utilised 24-hour recall method (24hDR), the Healthy Diet Indicator (HDI-2020), the Attitude Scale for Healthy Nutrition (ASHN), the 36-item Short Form Health Survey (SF-36), and the Job Performance Scale (JPS). All surveys were conducted through face-to-face interviews.

Results: The average JP score was 4.27±0.72 and no significant difference was observed between the JP scores of men and female participants. However, male healthcare workers had higher mean physical health scores (SF-36-PCSc) than female participants. There was no significant difference in the mean mental health scores (SF-36-MCSc) between genders. In women, positive correlations were found between JP and HDI-2020, ASHN, and SF-36-PCSc and SF-36-MCSc from SF-36. Logistic regression analysis revealed that factors influencing JP included education level, occupation, ASHN, and fibre consumption.

Conclusion: This study is the first to demonstrate the positive impact of dietary fibre, healthy diet quality, and eating habits on JP. These findings highlight the importance of promoting healthy eating habits that include a sufficient fibre diet to enhance JP in healthcare workers.

Keywords: *Job Performance; Dietary Fiber; Healthy Eating; Healthcare Workers; Middle Age*

ÖZET

Amaç: Sağlık çalışanlarında iş performansı, hasta güvenliği ve sağlık hizmetlerinin genel verimliliği açısından hayati öneme sahiptir. Sağlık çalışanlarında beslenme alışkanlıklarının ve yaşam kalitesinin iş performansı üzerindeki etkisini araştıran çalışmalar sınırlıdır. Bu çalışmada, orta yaşlı sağlık çalışanlarında sağlıklı beslenme alışkanlıklarının, diyetin ve yaşam kalitesi faktörlerinin iş performansı üzerindeki etkisi değerlendirilmiştir.

Gereç ve Yöntemler: Çalışmaya toplam 333 sağlık çalışanı katılmıştır. Veriler, 24 saatlik besin tüketim kaydı, Sağlıklı Beslenme Göstergesi (HDI-2020), Sağlıklı Beslenme İlişkin Tutum Ölçeği (SBİTÖ), 36 maddelik Kısa Form Sağlık Anketi (SF-36) ve İş Performansı Ölçeği kullanılarak toplanmıştır. Tüm anketler yüz yüze görüşmelerle uygulanmıştır.

Bulgular: Ortalama iş performansı puanı 4,27±0,72 bulunmuş, kadın ve erkek katılımcıların puanları arasında anlamlı bir fark gözlenmemiştir. Ancak, erkek sağlık çalışanlarının fiziksel sağlık puanı kadınlara göre daha yüksek bulunmuştur. Zihinsel sağlık puanlarında cinsiyetler arasında anlamlı fark saptanmamıştır. Kadınlarda iş performansı ile HDI-2020, ASHN, fiziksel sağlık ve zihinsel sağlık arasında pozitif korelasyon tespit edilmiştir. Lojistik regresyon analizine göre, iş performansını etkileyen faktörler arasında eğitim düzeyi, meslek, SBİTÖ ve lif tüketimi yer almaktadır.

Sonuç: Bu çalışma, diyet lifi, sağlıklı beslenme kalitesi ve yeme alışkanlıklarının iş performansı üzerindeki olumlu etkisini ortaya koyan ilk çalışmadır. Bulgular, sağlık çalışanlarının iş performansını artırmak amacıyla yeterli lif içeren sağlıklı beslenme alışkanlıklarının teşvik edilmesinin önemini vurgulamaktadır.

Anahtar Kelimeler: *İş Performansı; Diyet Lifi; Sağlıklı Beslenme; Sağlık Çalışanları; Orta Yaş*

INTRODUCTION

Due to technological advances, tremendous progress has been made in human health protection, disease diagnosis, and treatment, which led to increased quality of life and life expectancy. World Health Organization (WHO) stated that the rate of chronic diseases could be reduced via proper diet and lifestyle changes in developing and developed countries. It is crucial for public health that healthcare workers, particularly those working in healthcare institutions, know the importance of adequate and balanced nutrition. This awareness can enhance their attitudes and behaviors toward promoting healthy eating (1).

The health sector is vital in preventing health issues and improving overall well-being, more so than many other service sectors (2). The WHO defined healthcare workers as people who fundamentally accept the improvement of human health as their main target (3). Organization of Economic Cooperation and Development (OECD) Health Data for 2022 and the EUROSTAT database showed that there were 1470 health workers per 100000 people in OECD countries and 1442 health workers in European Union (EU) countries in 2020 (4).

Healthcare workers' job performance (JP) is significant for the safety of patients and the effectiveness of health services (5). However, only a few studies investigated the effect of healthy nutrition habits and diet quality on the JP of healthcare workers. Nevertheless, it is necessary to understand the potential relationship between the nutrition habits of workers working in health institutions and JP to improve health institutions' efficiency. Job performance is defined as the ability of workers to accomplish their duties and functions (6). A combination of different factors shapes JP, and it can be changed under the influence of individuals' knowledge, talents, motivation, health conditions, and environmental factors (7). A good JP is related to high efficiency, customer happiness, and profitability (8).

The OECD anticipated that in 2050, 27% of the world population will be above 65 years old, and at least 10% will be older than 80 (4). If human resources, which is probably the most complex resource to manage, are not directed correctly and effectively, it may cause a decline in performance and, consequently, failure. Organizations can reach their targets and have an advantage over their rivals provided they have workers with high job performance, are talented, accomplish their duties effectively, and contribute to organizational success (9). Thus, a healthy nutrition style, one of the factors positively affecting healthcare workers' life quality, gains importance (2). The present study aimed to assess the impact of healthy eating habits, diet, and quality of life factors on JP in middle-aged healthcare workers.

MATERIAL AND METHOD

This is a descriptive, cross-sectional study. The study sample was determined using a random sampling method. The study was conducted with healthcare workers at a university hospital between February and April 2023.

The sample size was calculated using the E-PICOS AI Smart Biostatistics Software version 21.3 (E-PICOS Inc., New York, NY, USA; https://www.epicos.ai/). In this study, for determining the sample size, a power analysis was performed with G*Power 3.1 (Heinrich-Heine University, Düsseldorf, Germany; http://www.gpower.hhu.de/) software using alpha (α) = 0.05, power ($1 - \beta$) = 0.95, and d = 0.87 (medium effect size), which indicated that at least 139 individuals (10). Inclusion criteria consisted of consenting to participation in the study, being in the 45-65 age group, and working as a healthcare worker (doctors, nurses, dentists, pharmacists, as well as other healthcare sector employees such as cleaners, support staff, and administrative workers).

The questionnaire form used for the study was filled out by the dietician working in a health institution during face-to-face interviews with the study participants. The questionnaire form consists of four parts. The first part has items about the participants' demographic and clinical data, such as age, gender, educational background, occupational information, comorbidities, and physical activity status. The same researcher also measured and recorded the participants' body weights (kg) and heights (cm). For height measurement, the head was kept on the Frankfurt horizontal plane while the horizontal line from the ear canal to the lower border orbit was parallel to the floor. The body weight was measured on an empty stomach in the morning, with light clothing and without shoes. For further

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analysis, the Body Mass Index (BMI) values were calculated using the formula: Body weight (kg)/(height (m^2) (11).

The second section of the questionnaire included the Attitude Scale for Healthy Nutrition (ASHN) and HDI-2020 to evaluate participants' dietary habits and overall diet quality. A retrospective 24-hour dietary recall (24hDR) was also conducted to gather detailed nutritional data, as it is one of the most widely used and validated dietary assessment methods, especially in individual interviews (12, 13).

HDI-2020, developed by the WHO, assesses adherence to healthy dietary guidelines. It consists of 11 components- five measuring consumption of recommended food groups (e.g., fruits and vegetables, legumes, nuts, whole grains, and dietary fibre) and six evaluating the intake of foods to be limited (e.g., total fat, sodium, added sugars, processed meats). Each component is scored from 0 and 1, with higher scores indicating better dietary adherence (14, 15).

The ASHN is as a 5-point Likert scale measuring attitudes toward healthy nutrition, categorized as "weak" (0-24), "moderate" (25-49), "good" (50-74) or "very good" (75-100) (16).

The third part of the questionnaire used the 36-item Short Form Health Survey (SF-36). The original SF-36 stemmed from the Medical Outcome Study, MOS, conducted by the RAND Corporation (17). Demiral et al. (2006) translated this form into Turkish and validated it (18). It is a questionnaire consisting of 36 items which measure 8 health-related subscales: Physical functioning (PF, 10 items), role limitation due to physical health (RP, 4 items), bodily pain (BP, 2 items), general health perception (GH, 5 items), vitality (VT, 4 items), social functioning (SF, 2 items), role limitation due to emotional problems (RE, 3 items), and perceived mental health (MH, 5 items). Correlated physical health and mental health scores (SF-36-PCSc and SF-36-MCSc) were calculated using the algorithm introduced by the developers:

SF-36-PCSc=(PF+RP+BP+GH)/4,

SF-36-MCSc= (VT+SF+RE+MH)/4.

The SF-36-PCSc and SF-36-MCSc scores were constructed by multiplying each SF-36 scale z-score by its respective scoring coefficient from the obliquely rotated two-factor solution. The summary scores ranged between 0 and 100: While 0 indicates poor health status, 100 implies good health status (18).

In the final part of the questionnaire, the Job Performance Scale (JPS) developed by Çalışkan and Köroğlu (2022) for measuring JP was applied (9). This 11-item questionnaire included questions depending on a 5-point Likert scale and consisted of 2 subscales: Task performance (TP) and Contextual Performance (CP). In this questionnaire, higher scores indicated higher JP (9).

This study was conducted in accordance with the principles of the Declaration of Helsinki and ethical approval was obtained from Toros University Ethics Committee (Date: 24/01/2023, Decision No: 12). Informed consent forms were obtained from all participants who agreed to participate in the study.

Statistical Analysis

The Statistical Package for Social Sciences software (SPSS v22, IBM Corp., Armonk, NY, US) was used for data analysis. Data were expressed as numbers (n), percentages (%), means, and standard deviations (SD). The conformity of variables to normal distribution was analyzed using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirrov/Shapiro-Wilk tests). The non-parametric Mann-Whitney U test was used to compare two independent groups regarding continuous variables. On the other hand, the non-parametric Spearman rank correlation was used to analyze the correlation between quantitative variables. Logistic regression analysis was performed to expose the variables affecting JP. A difference was considered statistically significant if the calculated p-value was lower than 0,05.

RESULTS

Overall, 333 healthcare workers (140 women and 193 men) aged 45 to 65 participated in the study. The mean age of the participants was 49.25±4.08 years. Healthcare workers had different duties: while 74.4% were healthcare professionals, 25.6% were other healthcare workers. The percentage of the workers who stated that they had a chronic morbidity (such as hypertension, diabetes mellitus, anemia, arthritis) was 27.3% (n=91). Ten (3.0%) participants were on a diet due to their chronic disease. Approximately 16%

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of the study participants were on a specific diet after consulting with a dietitian (n=23; 7%) or a physician (n=30; 9%). Nearly 34.1% (n=113) of the participants regularly exercised. The demographic and descriptive data of the subjects are shown in Table 1.

The mean JP score of the healthcare workers was 4.27±0.72, and there was no significant difference between male and female participants. The participants' mean SF-36-PCSc and SF-36-MCSc scores were 74.04±17.86 and 64.14±21.14, respectively. The mean SF-36-PCSc scores of men were significantly higher than women (p=0.01). On the other hand, there was no significant difference between men and women regarding SF-36-MCSc scores. The mean BMI was 26.05±4.14 kg/m²; the mean BMI of the male subjects was higher than female subjects (27.55±3.71 vs 25.46±4.17 kg/m²; p=0.005). Data regarding HDI-2020, SF-36, ASHN, and JP assessments are shown in Table 2.

The analysis results regarding the correlation between

Table 1. Demographic and descriptive data (n=333)

Variable	Value
Age, (±SD), years	49.25±4.08
Gender (M/F), n (%)	193 (58.0) / 140 (42.0)
Education	
Primary school	25 (7.6)
High school	58 (17.3)
Undergraduate/Graduate/Doctorate	250 (75.2)
Job, n(%)	
Healthcare professional	248 (74.4)
Other healthcare workers	85 (25.6)
Smoking, n(%)	
Yes	128 (38.5)
No	166 (50.0)
Quit smoking	39 (11.5)
Alcohol consumption, n(%)	
Yes	7 (2.2)
No	213 (64.0)
Social drinker	113 (33.8)
Regular physical activity, n (%)	
Yes	113 (34.1)
No	220 (65.9)

SD: standard deviation, M: male, F: female

Table 2. Data regarding HDI-2020, SF-36, ASHN and JP (n=333)

Variable, (±SD)	All workers	Men	Women	p
Job performance	4.27±0.72	4.25±0.95	4.28±0.61	0.51
Task performance	4.36±0.79	4.35±0.99	4.37±0.70	0.42
Contextual performance	4.19±0.77	4.16±0.96	4.20±0.69	0.67
SF-36-PCSc	74.04±17.86	79.06±16.62	71.96±18.04	0.01*
SF-36-MCSc	64.14±21.14	69.96±16.82	61.82±22.30	0.08
HDI-2020	4.82 ± 1.29	4.75±1.44	4.85±1.23	0.51
ASHN	75.32±7.96	73.43±8.00	76.05±7.86	0.130
BMI (kg/m²)	26.05±4.14	27.55±3.71	25.46±4.17	0.005**

JP: Job Performance; SF-36-PCSc: Short Form 36 Physical Health Score; SF-36-MCSc: Short Form 36 Mental Health Score; HDI-2020: Healthy Diet Indicator 2020; ASHN: Attitude Scale for Healthy Nutrition; BMI: Body Mass Index. Mann-Whitney U test, *p<0.05, **p<0.001.

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HDI-2020, SF-36, ASHN scores, and the JP scale are displayed in Table 3. A positive correlation was found between male subjects' TP and SF-36-MCSc scores (r=0.364, p=0.03). There were also significantly positive correlations between female healthcare workers' JP and HDI-2020 (r=0.214, p=0.04), ASHN (r=0.256, p=0.01), SF-36-PCSc (r=0.222, p=0.04) and SF-36-MCSc (r=0.279, p=0.009) scores.

Significant positive relationships were observed between TP and HDI-2020 (r=0.290, p=0.005), ASHN (r=0.235, p=0.02), SF-36-PCSc (r=0.209, p=0.05), and SF-36-MCSc (r=0.237, p=0.02). Additionally, positive significant relationships were found between CP and ASHN (r=0.208, p=0.04) and SF-36-MCSc (r=0.317, p=0.003) (Table 3).

According to logistic regression analysis, education level, occupation group, ASHN, and HDI-2020 "adequate fibre consumption (>25 g)" affected JP (Table 4).

DISCUSSION

In this cross-sectional study, 333 healthcare workers (140 women and 193 men) aged 45 to 65 participated. This study assessed the impact of healthy eating habits, diet, and quality of life factors on JP. There was no significant difference in the mean JP and mental health scores between genders. In women, positive correlations were found between JP and HDI-2020, ASHN, and the physical and mental health scores. This study is one of the first to suggest the sufficient dietary fibre intake is positively associated with job performance among healthcare workers, particularly in women.

Job performance is defined as the worker's contribution to his/her workplace and work accomplished under set conditions (19, 20). It is also a qualitative and quantitative summary of how much the worker reached the target (21). From another point of view, JP depends on the institutional mission, functional needs, and particular goals related to institutional values and beliefs (22).

The concept of JP is evaluated within the frame of Vroom's expectation theory and Kahneman and Tversky's expectation-value theory (23, 24). According to Vroom's theory, a staff member's performance relies on how much he/she desires the result of his/her efforts and his/her belief in the effect of an action on this result. In this theory, a staff member's effort depends mainly on value and expectation (24). A thorough JP evaluation is essential for institutions. This

Table 3. Data regarding correlation between diet and nutrition indices, physical and mental health scores and job performance based on gender (n=333)

Variables	Men		Women	
Job Performance	r	p	r	p
HDI-2020	0.054	0.75	0,214	0.04*
ASHN	0.019	0.91	0.256	0.01*
SF-36-PCSc	0.007	0.96	0.222	0.04*
SF-36-MCSc	0.269	0.11	0.279	0.009**
Task performance	r	p	r	p
HDI-2020	-0.046	0.79	0.290	0.005**
ASHN	0.188	0.26	0.235	0.02*
SF-36-PCSc	0.081	0.63	0.209	0.05*
SF-36-MCSc	0.364	0.03*	0.237	0.02*
Contextual performance	r	p	r	p
HDI-2020	0.039	0.82	0.149	0.15
ASHN	-0.051	0.76	0.208	0.04*
SF-36-PCSc	-0.045	0.79	0.158	0.14
SF-36-MCSc	0.197	0.25	0.317	0.003**

JP: Job Performance; HDI-2020: Healthy Diet Indicator 2020; ASHN: Attitude Scale for Healthy Nutrition; SF-36-PCSc: Short Form 36 Physical Health Score; SF-36-MCSc: Short Form 36 Mental Health Score. Spearman correlation analysis, *p<0.05, ** p<0.001.

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Table 4. Regression analysis between JP, HDI-2020, SF-36 and other variables (n=333)

Variables	Regression analysis (R^2 value=0.337, p=0.001**)		
	Coeff.	%95CI	p
Gender, n (M: 193/F:140)	0.222	-0.125 to 0.569	0.20
Number of children, n	0.117	-0.044 to 0.278	0.15
Education level, n Primary school (25) High school (58) Undergraduate/Graduate/Doctorate(250)	0.319	0.123-0.515	0.002**
Smoking, n No (166) Yes (128) Quit smoking (39)	-0.104	-0.259 to 0.052	0.19
Alcohol consumption, n No (213) Yes (7) Social drinker (113)	0.123	-0.034 to 0.281	0.12
Job, n Healthcare professional (248) Other healthcare worker (85)	0.509	0.169 to 0.849	0.004**
BMI (kg/m^2), (±SD)	0.026	-0.012 to 0.065	0.18
ASHN, (±SD)	0.021	0.003 to 0.039	0.02*
HDI-2020, (±SD) Vegetable-Fruit consumption ≥400 g	-0,138	-0.435 to0.160	0.36
HDI-2020, (±SD) Beans and Legume, > 0 g	-0,173	-0.451 to0.104	0.21
HDI-2020, (±SD) Dietary fibre, >25 g	0,606	-0.014 to 1.226	0.05*
SF-36-MCSc , (±SD)	0.007	-0.003 to 0.016	0.16
SF-36-PCSc, (±SD)	0.004	-0.007 to0.015	0.15

M: male, F: female, JP: Job Performance; HDI-2020: Healthy Diet Indicator 2020; ASHN: Attitude Scale for Healthy Nutrition; BMI: Body Mass Index; SF-36-PCSc: Short Form 36 Physical Health Score; SF-36-MCSc: Short Form 36 Mental Health Score. Significant difference was set at *p<0.05, **p<0.01.

process helps determine the worker's strengths and weaknesses (25). A worker's JP is evaluated under two main categories: TP and CP (26). Task performance is related to actions that support the staff in reaching set targets or meeting the main requirements of the work (27, 28). On the contrary, CP reflects positive behavior, which is not defined in job descriptions but is encouraged by the institution and supports the general functions (29).

Forming and maintaining a healthy workforce are the fundamentals of a health system's performance. If the welfare of the health workers is not preserved, absenteeism at work due to health issues may impact both patient care and the welfare of the other healthcare worker. Consequently, the general functioning of the health institution may be impaired (30). Several studies investigated the relationship between JP and life quality using standardized tools such as SF-36. These studies reported that individuals with high life quality are more motivated at work and, as a result, show better JP. A meta-analysis conducted by Faragher et al. (2005) reported that job dissatisfaction increases the risk of mental illnesses, adversely affects the general health state, and reduces life satisfaction (31).

Moreover, other studies showed a weak but statistically

significant relationship between JP and physical health. These studies stated that job satisfaction considerably affects individuals' general health conditions (32). In our study, the JP of female healthcare staff was positively correlated with SF-36-PCSc and SF-36-MCSc scores. Besides, the SF-36-PCSc scores of female workers were lower than those of male workers. On the contrary, no statistically significant differences were found between the JP, TP, and CP of male and female healthcare workers. According to the existing literature, the workers' physical and mental health conditions tremendously affect their JP (32, 33). It was observed that individuals with high scores in role limitation due to emotional problems, mental health, and social functioning dimensions of life quality scale accomplish their duties more efficiently (32). Individuals with high SF-36-PCSc scores also had higher JP (33).

Poor nutrition quality, excess energy intake, physical inactivity, obesity, and cardiovascular diseases pave the way for several non-infectious diseases, including type 2 diabetes, metabolic syndrome, and cancer. Epidemiological research on overweight or obese workers identified common characteristics such as long working hours, shift work, and job stress, revealing that these conditions affect all healthcare workers and increase their vulnerability to weight gain (34).

In present study, most participants were overweight according to WHO classification, and the mean BMI value of men was higher than women. Analysis of the relationship between JP and the diet quality of female healthcare workers revealed a positive correlation between the HDI-2020 values and JP. Specifically, it was observed that the individuals with higher HDI-2020 scores had a higher JP. These results comply with the research implying the importance of nutrition on cognitive functions, energy levels, and general welfare (35-37). Nutrition and health are two significant concepts that are mentioned together. Healthy nutrition, characterized as consuming nutrient-rich foods and avoiding excess unhealthy ones, can provide daily energy and macro and micronutrients needed by individuals for accomplishing their duties. Although research regarding the relationship between HDI-2020 and JP is scarce, the limited data indicate that healthy nutrition is closely related to improvement in cognitive functions, increase in energy levels and concentration, emotional state and stress management, productivity, and therefore, the JP (38, 39).

In this study, the logistic regression analysis revealed that being a health professional, having a high education level, a high ASHN point, and HDI-2020 compliant fibre consumption (>25g/day) positively affects the JP. Although there is no specific research about the relationship between dietary fibre intake and JP, it is widely accepted that foods with high fibre content positively affect general health and energy balance and, therefore, the JP of healthcare workers. Dietary fibre and whole grains include a unique mixture of bioactive compounds such as resistant starches, vitamins, minerals, phytochemicals, and antioxidants. In recent years, research about the potential health benefits of dietary fibre has gained attention. It has been postulated that the beneficial effects of dietary fibres on general health are related to the changes in intestinal viscosity and hormone production, nutrient absorption, intestinal motility, and production of short-chain fatty acids (40). On the other hand, this study is the first to report the favorable effects of dietary fibres, diet quality, and healthy nutrition habits on JP.

This study has several limitations that should be considered when evaluating its findings. First, as it is a cross-sectional study, it cannot establish a cause-and-effect relationship. Second, the study sample was relatively small and heterogeneous. Third, it did not include a control group. Therefore, these findings must be validated through randomized controlled trials with larger and more diverse participant samples.

CONCLUSION

In present study, a positive correlation has been found between JP and healthy eating habits, particularly those involving sufficient fibre intake. These results highlight the importance of promoting and maintaining healthy nutrition to enhance JP. Further research should be conducted to identify potential interventions to improve nutritional habits and develop strategies to enhance the dietary quality of healthcare workers.

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