Original Article

Contamination Fear Among Dermatology Residents: A Comparative Study

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Abstract

Aim: Depression, burnout, and obsessive-compulsive symptoms are common in physicians. This study aimed to examine the fear of contamination among dermatology residents compared to surgical residents and to highlight it as a workplace stress factor.

Materials and Methods: The fear of contamination in dermatology residents was investigated and compared with that of surgical residents. Participants were recruited from two tertiary hospitals in Ankara. Fear of contamination was measured using the Padua Inventory-Washington State University Revision and Contamination Cognition Scale.

Results: Female dermatology residents tended to score highly on the scales. They experienced contamination anxiety more frequently outside the workplace. The perception of not having training in contagious dermatological diseases and the tendency to research this topic are more common than previously thought. In regression analysis, carrying hand sanitizer, using it outside of the workplace, and experiencing similar levels of fear outside the workplace were risk factors for being in the high-scoring group. The practice of laying napkins on the toilet seat and holding the toilet brush with napkins was prevalent in all the units.

Conclusion: In general, residents are concerned about contamination and behavioral avoidance in hospitals. Female dermatologists are more susceptible to fear of contamination. In this situation, medical education is insufficient. It may be beneficial to assess individual perceptions before the start of the residency program. Managers should establish a safe and reliable environment and proper education to reduce anxiety and occupational stress among residents.

Keywords: Healthcare workers, fear of dirt and germs, obsessive-compulsive symptoms

Introduction

Physicians are more prone to depression and burnout than other workers.[1,2] There are studies indicating that obsessive-compulsive symptoms are more commonly observed in physicians.[3] In fact, this has been demonstrated in numerous studies conducted during the coronavirus disease-2019 (COVID-19) pandemic. Healthcare workers showed higher levels of obsessive-compulsive symptoms at the beginning of the pandemic.[4] Females and healthcare workers who felt psychological pressure during the pandemic had higher obsessive-compulsive symptom scores.[5] Obsessive-compulsive symptoms significantly increased during the pandemic compared to the pre-pandemic period.[6] The frequent occurrence of these symptoms even before the pandemic and their intensification in the presence of a contagious disease agent suggest that fear of contamination may represent a silent stressor in the professional lives of healthcare workers.

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First, this study aimed to examine the obsessional thoughts of dermatology residents on fear of contamination and to compare them with those of surgery residents. Second, it aimed to indicate the place of fear of contamination, as a stress factor among many other stress factors in the workplace.

Materials And Methods

Selection of Participants

With their informed consent, the study was conducted among residents working in two tertiary hospitals in Ankara (University of Health Sciences Türkiye, Ankara Etlik City Hospital and Gülhane Training and Research Hospital) to compare the fear of contamination in dermatology and surgery residents between January 2025 and June 2025.

The hospitals included in the study were selected because they have similar physical conditions and geographical proximity, and are located in the center of Ankara, serving a similar yet diverse patient population.

Residents in obstetrics and gynecology, in plastic surgery, and from the two hospitals served as the comparison group. General surgery and urology residents were not included in the study group because, in their routine practice, they frequently consulted the dermatology department for infectious diseases, dermatological conditions, and sexually transmitted infections encountered during examination of the anogenital skin and mucosa. In contrast, in their daily practice, plastic surgeons, who more frequently examined the skin and mucosa, and obstetrics and gynecology residents, who routinely examined the anogenital skin, were prioritized as the comparison group among all surgical residents.

Residents with psychiatric disorders and those undergoing psychiatric treatment were excluded from the study. This is because existing psychiatric conditions may lead to extreme values in the psychometric scale scores, potentially affecting the overall means.

Fear of Contamination Measurement

In the research group, fear of contamination was measured using the Padua Inventory-Washington State University Revision (PI-WSUR) and Contamination Cognitions Scale (CCS). The PI-WSUR was revised by Burns et al.[7] based on the original scale established by Sanavio.[8] Translation into Turkish and a validity analysis were conducted by Yorulmaz et al.[9] The scale consisted of five subscales and 39 5-point Likert-type questions, scored between 0 (not at all), 1 (a little), 2 (quite a lot), 3 (a lot), and 4 (very much). The subscales were obsessive thoughts about harming oneself or others (7 items), obsessive impulses to harm self/other (9 items), checking compulsions (10 items), dressing/grooming compulsions (3 items), and contamination obsessions and washing compulsions (10 items).

CCS, developed by Deacon and Olatunji[10], is a 13-item scale associated often with patients' perception of contagious objects, and consists of two parts. The probability of contamination by contact with the object in the first part of the scale, and the threat perception regarding the possible consequences after contamination in the second part, are scored between 0 and 100 in each item. The points that could be obtained in each section ranged from 0 to 1300. It was translated into Turkish by İnözü and Eremsoy[11], and a validity analysis was conducted.

Along with these scales, the participants were given a form consisting of demographic data and other questions. The form was delivered to the participants via an Internet link sent via message and was filled electronically (Supplementary File 1).

The study received approval from the Scientific Research Evaluation and Ethics Committee of Ankara Etlik City Hospital (approval number: AEŞH-BADEK-2024-044, date: 31.01.2024).

Statistical Analysis

Descriptive statistics were used to analyze the demographic data. The chi-squared test was used to examine categorical data. In the chi-square analysis, categories with low frequencies within groups were either combined or analyzed separately in their original forms. The analyses were strengthened by including fewer than five categorical data points in similar groups. For multiple comparisons, the Fisher-Freeman-Halton test and the adjusted z-value significance level were used, along with the Bonferroni correction. The normality of the distribution was examined using the Kolmogorov-Smirnov, or Shapiro-Wilk tests. Averages were compared using an independent samples t-test or Mann-Whitney U test. The Kruskal-Wallis test or one-way ANOVA was used to compare the means between more than two groups. Further examination of intergroup comparisons was conducted using the Tukey or Games-Howell test, depending on the homogeneity of variances.

The participant group was divided into two low-score and high-score groups according to PI-WSUR and CCS scores, based on the study conducted by Deacon and Olatunji.[10] They divided PI-WSUR (COWC) and CCS into low- and high-score groups according to the average scores from healthy and patient groups.[9] Binary logistic regression analysis was performed with gender, age, department, working year, excluding those related to laying a napkin on the toilet seat and using the brush in the toilet, as well as other questions. Among the variables, those that violated the linearity assumption, as

determined by the Box-Tidwell test and variance inflation factor, were excluded. Univariate and multivariate regression analyses were performed using the enter method. Then, the significant variables and all other variables were included in the regression model using the backward stepwise likelihood ratio method. Statistical significance was set at $P < 0.05$.

Results

The survey was administered to 342 residents. A total of 112 volunteers participated in the study, and 15 were excluded from the analysis because they were diagnosed with a psychiatric illness or were taking psychiatric medication. Of the participants, 97 were included in the study, comprising 38 dermatology residents (39.2%) and 59 surgical residents (60.8%). Of the participating surgical residents, 14 (23.73%) were obstetrics and gynecology residents and 45 (76.27%) were plastic surgery residents. The mean age of participants was 28.08±2 in the dermatology department and 28.42±2.3 in the surgery department. There were 29 females (29.9%) and 9 males (9.3%) in the dermatology group and 26 females (26.8%) and 33 males (34%) in the surgery group. The participants' departments, years of residency, and gender distribution are presented in Figure 1, and the distribution and mean scores of the answers are presented in Tables 1 and 2. There was no difference the mean age or years of residency between departments. There was a significant difference between the genders ($P = 0.002$), with males being more commonly represented in surgery and females in dermatology. The internal consistency of the scales (Cronbach α) was calculated as 0.93 for PI-WSUR, 0.92 for the PI-WSUR contamination and cleaning subscale, 0.96 for the first part of the CCS, 0.97 for the second part of the CCS, and 0.98 for the whole CCS. There was a significant correlation between CCS subscale scores and another variable ($r = 0.815$, $P < 0.001$). A positive correlation was observed between the PI-WSUR COWC subscale and the CCS ($r = 0.710$, $P < 0.001$).

The answers to the question "do you have education about contagious dermatologic diseases?" varied between departments ($P < 0.05$), with the answer "yes" being more frequently given by females in surgery and by men in dermatology. There is no difference between the answers given to the question "Have you ever researched contagious dermatologic diseases?".

There was no difference between the departments in the scores given to the scales, (PI-WSUR and CCS). In the gender subgroup analysis between departments, the total score of the PI-WSUR COWC subscale, the first part of the CCS, and the CCS total score differed ($P < 0.05$). This difference was observed, with females scoring higher in dermatology. Similarly, the PI-WSUR COWC subscale, CCS subscales,

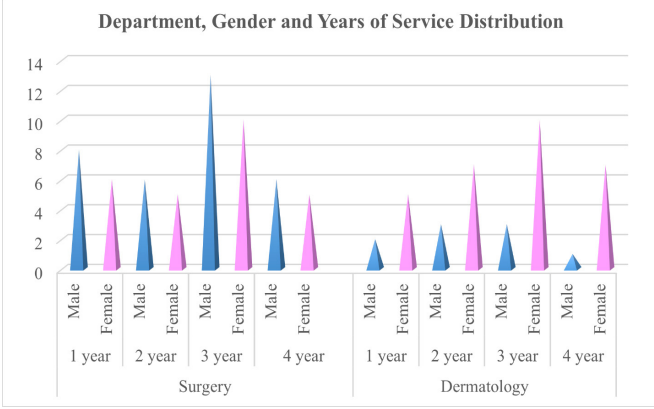

Figure 1. The distribution of unit, working year and gender

Table 1. Mean score of participants' answers to scales and survey questions

	Surgery	Dermatology
	Mean (min.-max.)	Mean (min.-max.)
PI-WSUR* (COWCS++)	13.07±8.95 (0-37)	15.84±9.86 (1-38)
PI-WSUR* (Total)	28.1±20.37 (0-96)	32.34±17.66 (6-88)
CCS+ (1. part)	663.56±319.82 (90-300)	784.74±320.34 (60-1200)
CCS+ (2. part)	641.02±356.01 (10-1300)	746.58±308.88 (160-1300)
CCS+ (total)	1304.58±650.29 (180-2600)	1531.32±587.1 (330-2450)
Senior influence	2.78±3.09 (0-10)	3.82±2.82 (0-10)
Hospital routine cleaning	3.49±2.71 (0-10)	4.29±1.96 (0-9)
Use of staff toilets	6.03±3.52 (0-10)	7.29±2.88 (0-10)
Fear of contamination outside the workplace	5.14±2.88 (0-10)	6.29±3.08 (1-10)
Confidence in protective equipment	6.15±2.15 (0-10)	6.76±2.03 (1-10)

*PI-WSUR: Padua Inventory-Washington State University Revision, ++COWC: contamination obsessions and washing compulsions subscale, +CCS: Contamination Cognitions Scale, Min.: Minimum, Max.: Maximum

Table 2. The distribution of answers

		Yes		No		Total	*P**
Education	Surgery	28 (47.46%)		31 (52.54%)		59 (100%)	**< 0.05**
	Dermatology	28 (73.68%)		10 (26.32%)		38 (100%)	
Research	Surgery	11 (18.64%)		48 (81.36%)		59 (%100)	-
	Dermatology	13 (34.21%)		25 (65.79%)		38 (%100)	
Lay a napkin on the toilet seat		Never	Rarely	Sometimes	Usually	Always	
	Surgery	4 (6.78%)	4 (6.78%)	7 (11.86%)	10 (16.95%)	34 (57.63%)	-
	Dermatology	2 (5.26%)	4 (10.53%)	4 (10.53%)	8 (21.05%)	20 (52.63%)	
Carry hand sanitizer	Surgery	16 (27.12%)	12 (20.34%)	14 (23.73%)	13 (22.03%)	4 (6.78%)	**< 0.05**
	Dermatology	6 (15.79%)	9 (23.68%)	2 (5.26%)	15 (39.47%)	6 (15.79%)	
Using hand sanitizer	Surgery	14 (23.73%)	14 (23.73%)	23 (38.98%)	5 (8.47%)	3 (5.08%)	**< 0.001**
	Dermatology	6 (15.79%)	6 (15.79%)	6 (15.79%)	14 (36.84%)	6 (15.79%)	
Using a toilet brush		Bare hand	With napkin	Usually not		Never	
	Surgery	15 (15.46%)	27 (27.84%)	10 (10.31%)		7 (7.22%)	-
	Dermatology	15 (15.46%)	18 (18.56%)	3 (3.09%)		2 (2.06%)	

**P*: *P* -value

and CCS total scores were higher in female dermatologists than in surgery residents ($P < 0.05$, $P = 0.007$, and $P < 0.05$, respectively). There were no differences between the male dermatologists and surgical residents.

In the other survey questions related to fear of contamination, a significant difference was observed in only three questions. The analyses for these questions were as follows: carrying hand sanitizers with you and using hand sanitizers out of the workplace were two of the three questions that yielded significant differences ($P < 0.05$ and $P < 0.001$, respectively). There were no differences between departments in carrying hand sanitizers. Those who report using hand sanitizers often outside the workplace are more likely to be in the dermatology department. In the analysis conducted within the interdepartmental gender subgroup, the use of hand sanitizers outside the workplace was higher among female dermatologists than among female surgeons ($P < 0.001$). Female dermatologists were more likely to carry and use hand sanitizers than were surgical residents ($P = 0.004$ and $P < 0.001$, respectively). There were no differences between the male dermatologists and surgical residents. The third difference observed was in the responses regarding the effect of seniors, professors, or other friends on the fear of contamination, where dermatologists received higher scores ($P < 0.05$). In the gender subgroup analysis, the scores of the female dermatologists were significantly higher than those of the surgery residents ($P < 0.05$). However, male dermatologists were not distinct in this analysis between groups or conditions.

The three questions that did not differ between the units but showed a difference in the subgroup comparison were about belief in the effectiveness of routine cleaning in the hospital, trust in protective equipment, and experiencing concerns about cleanliness and hygiene in the hospital. Female dermatologists gave higher scores than male surgeons in believing that routine cleaning in the hospital was effective and in trusting protective equipment ($P < 0.05$). Female dermatologists were more concerned about cleanliness and hygiene outside the workplace than surgeons ($P = 0.004$). Male dermatologists did not show any difference in their responses to these questions.

In the gender comparisons within each department, there was no difference in the surgical department. In the dermatology department, the PI-WSUR COWC subscale, and the subscales and total scores of CCS were higher for female dermatologists ($P < 0.05$). Female dermatologists were more concerned about cleanliness and hygiene outside the workplace than inside ($P = 0.003$).

Scores were grouped into high- and low-score categories: 24 individuals in the low-score group and 42 individuals in the high-score group for PI-WSUR COWC; 17 individuals in the low-score group and 54 individuals in the high-score group for CCS (Figure 2). Dermatologists were more common in

the high-scoring group on the CCS scale ($P < 0.05$). In the PI-WSUR COWC subscale, no significant differences were found between departments. There was no difference between genders in the analysis conducted within the departments themselves. In the interdepartmental analysis by gender, the rate of dermatologists was higher in the high score group compared to the low score group for females on both scales ($P < 0.05$); whereas for males, no difference was observed. The regression analysis for the high- and low-scoring group memberships of the participants is presented in Tables 3 and 4, respectively. When all variables were analyzed together in the PI-WSUR COWC subscale, the regression model demonstrated 84.8% accuracy ($P < 0.001$). The accuracy of the co-analysis of significant variables was 81.8% ($P < 0.001$). In these two analyses, the goodness-of-fit test result was not significant. In the final step of the backward stepwise likelihood ratio method, multivariate analysis of all variables yielded an accuracy of 81.8% ($P < 0.001$). The analysis with significant variables yielded results with an accuracy of 81.8% ($P < 0.001$). The goodness-of-fit test was also significant for both analyses ($P = 0.012$).

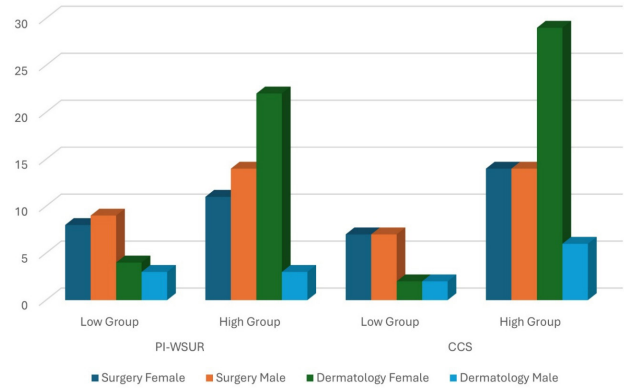

Figure 2. The distribution of participants according to gender, department and score groups (PI-WSUR: Padua Inventory-Washington State University Revision contamination obsessions and washing compulsions subscale, CCS: Contamination Cognitions Scale)

In the regression analysis of CCS, the multivariate analysis of all variables was found to be significant, achieving an accuracy of 85.9% ($P = 0.003$). The accuracy of the co-analysis of significant variables was 81.7% ($P = 0.002$). The goodness-of-fit analysis was not significant for these two analyses. The accuracy of the last model was 81.7% ($P < 0.001$), as determined

Table 3. Regression analysis of contamination scales (univariate and multivariate analysis)

PI-WSUR COWCS+	*P* -value	OR#	Confidence interval (95%)	
Univariate analysis			Lowest	Highest
Carry hand sanitizers*	0.005	6.35	1.73	23.26
Use hand sanitizers outside the workplace*	< 0.001	22.67	4.34	118.42
Fear of contamination outside the workplace	< 0.001	85.89	9.22	800.28
Multivariate analysis				
Use hand sanitizers outside the workplace*	0.030	107.50	1.57	7341.69
Multivariate analysis (significant variables)				
Use hand sanitizers outside the workplace*	0.036	26.82	1.2	577.8
Fear of contamination outside the workplace	0.012	26.523	2.078	338.554
CCS++				
Univariate analysis				
Age	0.026	4.67	1.20	18.11
Fear of contamination outside the workplace	< 0.001	77.37	6.88	870.56
Use hand sanitizers outside the workplace*	0.018	77.37	6.88	870.56
Multivariate analysis				
Age	0.025	0.48	0.256	0.911
Fear of contamination out of work place	0.02	167.24	2.28	12293.9
Carry hand sanitizers*	0.048	0.008	0	0.95
Multivariate analysis (significant variables)				
Fear of contamination outside the workplace	0.003	63.23	3.98	1004.7

*: Usually group, +PI-WSUR: Padua Inventory-Washington State University Revision Contamination Obsessions and Washing Compulsions Subscale, CCS++: Contamination Cognitions Scale, #OR: Odds ratio

Table 4. Regression analysis of contamination scales (multivariate backward stepwise likelihood ratio method)

PI-WSUR COWCS+	*P* -value	OR#	Confidence interval (95%)	
Backward stepwise likelihood ratio method (multivariate)			Lowest	Highest
Fear of contamination outside the workplace	0.012	26.15	2.07	329.8
Use hand sanitizers outside the workplace*	0.022	8.23	1.35	50.12
Backward stepwise likelihood ratio method (significant variables)				
Fear of contamination out of work place	0.012	26.52	2.08	338.6
Use hand sanitizers outside the workplace*	0.022	8.23	1.35	50.12
CCS++				
Backward stepwise likelihood ratio method (multivariate)				
Fear of contamination outside the workplace	<0.001	64.11	5.20	789.99
Backward stepwise likelihood ratio method (significant variables)				
Fear of contamination outside the workplace	<0.001	77.37	6.88	870.56

*: Usually group, +PI-WSUR COWCS: Padua Inventory-Washington State University Revision Contamination Obsessions and Washing Compulsions Subscale, CCS++: Contamination Cognitions Scale, #OR: Odds ratio

by backward-stepwise likelihood ratio method analysis of all variables. In the analysis of significant variables, the accuracy was 85.9% ($P < 0.001$). The goodness-of-fit was significant in both analyses ($P = 0.003$ and $P = 0.018$, respectively). The analysis revealed that experiencing the fear of contamination outside, similar to that experienced in the hospital, increased the probability of entering the high-score group on the fear of contamination scales. Additionally, carrying hand sanitizers and using them after touching something in public areas were also predictors of this outcome. On the other hand, age is a predictor that reduces the likelihood of entering the high-score group in some analyses.

Discussion

There is variation among the residents participating in the study in terms of their perceived level of education regarding contagious dermatological diseases. While dermatologists stated that they were educated in this regard, notably, female dermatologists believe they are not as well trained as their male counterparts. In surgery, women reported being more educated. The majority of the participants did not undertake any research related to contagious dermatological diseases. Among the participants researching this subject, women were more numerous in the dermatology unit, while men and women were similar in number in the surgical department.

Dermatologic disorders and sexually transmitted diseases cause stigmatization in patients.[12] Interestingly, in studies on infectious diseases, such as human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV), some physicians have negative attitudes towards patients. Excessive fear of contamination, personal prejudices, and a lack of education can hinder these ideas.[13-15] In a study evaluating the attitudes of medical school students towards HIV patients, negative attitudes were observed among students in both pre-clinical and post-clinical years. It was concluded that education was not effective enough to change these attitudes.[16] Another study revealed the negative attitudes of nursing students towards HIV patients and their fear of contamination, and it was reported that this situation decreased with education.[17] Considering that all participants received medical school training, and dermatologists have a better understanding of dermatological literature, the diversity of perceptions about education suggests that education may be insufficient to achieve its goal. In this regard, incorporating such training as part of in-service or even department-level education for residents may improve professional attitudes and reduce stress related to contamination fear.

Female dermatologists are more likely to carry and use hand sanitizers after touching something in public areas. The senior colleagues had a greater influence on their fear of contamination. In the analyses conducted within the departments, there was no difference in fear of contamination in surgery; however, in comparison, female dermatologists received higher scores. The fact that there was no difference in the fear of contamination scales between the units suggests that the presence of women in the surgical unit does not significantly affect the results and may also be attributed to the balancing effect of male dermatologists. Additionally, female dermatologists are more likely to experience concerns about hygiene outside the workplace than their male counterparts.

The number of individuals in the high-score group on both scales was high. Upon further analysis, individuals in the high-scoring group were more likely to be dermatologists,

particularly female dermatologists. In the regression analysis, carrying and using disinfectants, as well as experiencing similar fears outside the workplace, increased the probability of being in the high score group. Although department and gender are not defined as predictors of risk factors, being a woman and a dermatologist may mean experiencing more stress at work due to the high scores given by female dermatologists on the fear of contamination scales.

Studies have reported that obsessive-compulsive symptoms are more common among healthcare workers and women. They have higher levels of fear about dirt, germs, and viruses compared to other workers, and higher rates of compulsive handwashing compared to other workers due to the fear of contamination.[18] A study conducted in Italy found that healthcare workers on the front lines during the pandemic exhibited higher levels of obsessive-compulsive symptoms and experienced a more pronounced fear of contamination. These symptoms were observed more frequently in this group than in other healthcare workers, likely due to their higher risk of exposure to the infectious agent.[19] A study conducted in China reported that healthcare workers exhibited elevated levels of obsessive-compulsive symptoms both during and after the pandemic, with a pronounced fear of infection. The study also identified female gender as a risk factor in this context.[20] A systematic review and meta-analysis yielded similar results regarding the prevalence of obsessive-compulsive symptoms among healthcare workers; however, gender did not emerge as a significant risk factor. This finding suggests that male dermatologists who were relatively underrepresented in the studymay also be at risk, although this could not be demonstrated in this study. The authors also emphasized that this issue among healthcare professionals may negatively affect their mental health and lead to impact on healthcare.[21] Another study from Türkiye found that frontline healthcare workers during the COVID-19 pandemic exhibited higher levels of obsessive-compulsive symptoms compared to other healthcare professionals, which was attributed to more frequent contact with patients, increased use of protective equipment, and heightened fear of infection.[22] A study conducted in the United Kingdom identified fear of contamination as a factor that increases psychological stress and negatively affects healthcare workers' performance and job satisfaction. This fear also reduced their ability to tolerate uncertainty in high-risk environments. Furthermore, it was noted that such fear may lead to precautionary behaviors and deterioration in patient communication.[23]

In a study conducted among dermatologists regarding glove use and hygiene practices, it was found that they generally avoided shaking hands with patients before the examination, preferred to wear gloves during examinations, and reported wearing gloves when examining patients with HIV, HBV, or HCV, primarily to protect the patient. At the same time, the purpose of wearing gloves was to ensure the physician's self-protection, with 78% of physicians citing this reason. The habit of washing hands and using disinfectants is often present in those who wear gloves. Fear of contamination has been reported to be as high as 80%. Half of the physicians believed that wearing gloves did not disrupt the patient-physician relationship. The majority of these statements were made by younger and female dermatologists. However, it is not necessary to wear gloves when examining unbroken skin and when shaking hands.[24]

In another study examining the behavioral avoidance and hand hygiene practices of physicians in hospitals, physicians felt safer against contamination when both they and their colleagues provided adequate hand hygiene. After touching objects with a high probability of contamination (such as medical equipment, after using the toilet, or door handles in restrooms), they either used hand sanitizers or avoided further contact. Carrying hand sanitizers and disinfecting hands after touching telephone receivers were both reported less frequently than other preventive measures. The study highlights the influence of both environmental factors and personal perceptions on the fear of contamination and contamination-related behaviors.[25]

When compared with these findings, the study's results are consistent with the existing literature on fear of contamination. In the dermatology department, female dermatologists tend to place barriers between the patient and their environment, avoiding direct contact and relying more on protective equipment. In both departments, it is common to lay a napkin on the toilet seat while sitting, and to hold a toilet brush with a napkin. There is excessive discomfort regarding other personnel using staff toilets, reliance on protective equipment, and low confidence in routine cleaning in the hospital. The regression analysis findings indicate that carrying disinfectants and experiencing similar fears outside the workplace are factors that increase the likelihood of being in the group with a high fear of contamination. This reveals that personal perceptions contribute to fear of contamination.

Study Limitations

The limitations of the study are that it was not multicentered; more female dermatologists were involved, leading to underrepresentation of male dermatologists; all surgery departments were not included; there were insufficient participants for regression analysis; the answers given to

the study questions were based on self-reported data; it was performed on relatively healthy individuals; the evaluation scales focused on the fear of contamination but not on avoidance behavior. Another limitation of the present study is that the surveys were conducted online, which may have introduced certain biases such as social desirability bias. This potential influence should be taken into account when interpreting the findings, as participants might have responded in a way that they perceived to be more socially acceptable rather than reflecting their true opinions or behaviors.

Conclusion

In summary, based on the current literature and findings, dermatology residents tend to be more concerned about contamination, whereas female dermatologists appear to prioritize this concern more prominently. Education is insufficiently effective in alleviating this fear and avoidance behavior; there is even the perception that one is not educated about it. The fear of contamination in the dermatology department and the residents' behaviors based on this fear may have a negative impact on vulnerable dermatology patient populations, leading to stigmatization.

It may be helpful to create an environment that is safe for dermatologists, with developed hand hygiene facilities for both residents and patients in exam rooms, identify individuals who are predisposed to obsessive thoughts about contamination, and increase education on this subject. Furthermore, training should go beyond basic medical education, as our findings suggest that it does not sufficiently reduce the fear of contagion. Therefore, educational programs addressing commonly encountered concerns in clinical practice may help reduce the fear of contamination in professional settings. These concerns such as the duration of pathogen viability on inanimate surfaces, basic disinfection methods for such surfaces, the effectiveness of disinfectants used after contact, the probability of contracting an infectious disease following contact with contaminated surfaces, and the risk of transmission through bare-handed contact. Another important topic that could be included in such training programs is how physicians' avoidance behaviors and fear of contamination may negatively affect the physician-patient relationship, making patients feel uncomfortable or stigmatized.

Moreover, the question of why surgical residents, particularly female residents, express fewer concerns than do female dermatologists remains unanswered.

Ethics

Ethics Committee Approval: The study received approval from the Scientific Research Evaluation and Ethics Committee of Ankara Etlik City Hospital (approval number: AEŞH-BADEK-2024-044, date: 31.01.2024).

Informed Consent: Written informed consent was obtained from all participants prior to data collection.

Footnotes

Authorship Contributions

Surgical and Medical Practices: K.K., H.K., S.P.K., Concept: K.K., H.K., S.P.K., Design: K.K., H.K., S.P.K., Data Collection or Processing: K.K., H.K., S.P.K., Analysis or Interpretation: K.K., H.K., S.P.K., Literature Search: K.K., H.K., S.P.K., Writing: K.K., H.K., S.P.K.

Conflict of Interest: The authors declared that they have no conflict of interest.

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Supplementary Table 1. Survey questions	
1. Gender (female/male):	Female Male
2. Date of birth D/M/Y:	
3. Department:	Dermatology Surgery
4. When did you start your residency (D/M/Y):	
5. Have you ever had any diagnosis on psychiatric illnesses?	Yes No
6. Are you on medication about psychiatric problems?	Yes No
7. Do you have an education on contagious dermatologic diseases?	Yes No
8. Have you ever researched contagious dermatologic diseases?	Yes No
9. The following statements refer to thoughts and behaviors which may occur to everyone in everyday life. For each statement, choose the reply which best seems to fit you and the degree of disturbance which such thoughts or behaviors may create. Rate your replies as follows: 0= Not at all, 1= A little, 2= Quite a lot, 3= A lot, 4= Very much	
1. I feel my hands are dirty when I touch money	1 2 3 4
2. I think even slight contact with bodily secretions (perspiration, saliva, urine, etc.) may contaminate my clothes or somehow harm me	1 2 3 4
3. I find it difficult to touch an object when I know it has been touched by strangers or by certain people	1 2 3 4
4. I find it difficult to touch garbage or dirty things	1 2 3 4
5. I avoid using public toilets because I am afraid of disease and contamination	1 2 3 4
6. I avoid using public telephones because I am afraid of contagion and disease	1 2 3 4
7. I wash my hands more often and longer than necessary	1 2 3 4
8. I sometimes have to wash or clean myself simply because I think I may be dirty or ‘contaminated’	1 2 3 4
9. If I touch something I think is ‘contaminated’ I immediately have to wash or clean myself	1 2 3 4
10. If an animal touches me I feel dirty and immediately have to wash myself or change my clothing.	1 2 3 4
11. I feel obliged to follow a particular order in dressing, undressing and washing myself	1 2 3 4
12. Before going to sleep I have to do certain things in a certain order	1 2 3 4
13. Before going to bed I have to hang up or fold my clothes in a special way	1 2 3 4
14. I have to do things several times before I think they are properly done	1 2 3 4
15. I tend to keep on checking things more often than necessary	1 2 3 4
16. I check and re-check gas and water taps and light switches after turning them off	1 2 3 4
17. I return home to check doors, windows, drawers, etc. to make sure they are properly shut	1 2 3 4
18. I keep on checking forms, documents, cheques in detail to make sure I have filled them in correctly	1 2 3 4
19. I keep on going back to see that matches, cigarettes, etc. are properly extinguished.	1 2 3 4
20. When I handle money I count and recount it several times	1 2 3 4
21. I check letters carefully many times before posting them	1 2 3 4
22. Sometimes I am not sure I have done things which in fact I know I have done	1 2 3 4
23. When I read, I have the impression I have missed something important and must go back and re-read the passage at least two or three times	1 2 3 4
24. I imagine catastrophic consequences as a result of absentmindedness or minor errors which I make	1 2 3 4
25. I think or worry at length about having hurt someone without knowing it.	1 2 3 4
26. When I hear about a disaster, I think somehow it is my fault	1 2 3 4
27. I sometimes worry at length for no reason that I have hurt myself or have some disease	1 2 3 4
28. I get upset or worried at the sight of knives, daggers, and other pointed objects.	1 2 3 4
29. When I hear about suicide or crime, I am upset for a long time and find it difficult to stop thinking about it	1 2 3 4
30. I invent useless worries about germs and disease	1 2 3 4
31. When I look down from a bridge or a very high window, I feel an impulse to throw myself into space	1 2 3 4
32. When I see a train approaching, I sometimes think I could throw myself under it’s wheels	1 2 3 4
33. At certain moments, I am tempted to tear my clothes off in public	1 2 3 4
34. While driving I sometimes feel an impulse to drive the car into someone or something.	1 2 3 4
35. Seeing weapons excites me and makes me think violent thoughts	1 2 3 4
36. I sometimes feel the need to break or damage things for no reason	1 2 3 4
37. I sometimes have an impulse to steal other people’s belongings, even if they are of no use to me…	1 2 3 4
38. I am sometimes almost irresistibly tempted to steal something from the supermarket	1 2 3 4
39. I sometimes have an impulse to hurt defenseless children or animals.	1 2 3 4

10. Contamination Cognitions Scale

Instructions: Below is a list of objects. Please read the description of each object and try to imagine what would happen if you touched that object and were unable to wash your hands afterward. For each object listed, answer two questions:

(1) What is the likelihood that touching the object would result in your being contaminated? Answer using the following 0-100 scale:

0 10 20 30 40 50 60 70 80 90 100

not at all moderately likely extremely likely

(2) If you actually did become contaminated by touching the object, how bad would it be? Answer using the following 0-100 scale:

0 10 20 30 40 50 60 70 80 90 100

not at all moderately bad extremely bad

Object	Likelihood that touching object would cause contamination (0-100 scale)	If actually contaminated, how bad would it be? (0-100 scale)
Toilet handle in public restroom		
Toilet seat in public restroom		
Sink faucet in public restroom		
Public door handles		
Public workout equipment		
Public telephone receivers		
Stairway railings		
Elevator buttons		
Animals		
Raw meat		
Money		
Unwashed produce (e.g., fruits, vegetables)		
Foods that other people have touched		

12. Do your senior colleagues, professors' hygiene and/or avoidance behaviours at workplace affect your fear of contamination? (0-10) 0-not at all 10-completely

13. How much do you think of the effectiveness of routine hospital cleaning service? %0-100

14. Do you lay napkins on toilet seat in hospital restrooms? (Always Usually Sometimes Rarely Never)

15. How do you use the toilet brush in hospital restrooms?
a) I use it with my bare hand
b) I use it by holding it with a napkin
c) I do not use it most of the time
d) I never use it

16. How many points do you give about "I am not comfortable with the idea that other personnel use the staff toilet other than doctors in the hospital"? (0-10) 0-not at all 10-completely

17. How much do you feel fear of contamination out of the workplace? (%0-100) 0-not at all 100-completely

18. How much do you trust your protective equipment?
(%0-100) 0-not at all 100-completely

19. Do you carry hand sanitizer? (Always Usually Sometimes Rarely Never)

20. Do you use hand sanitizer out of the workplace?
(Always Usually Sometimes Rarely Never)