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Evaluation of Surgical Nurses' Attitudes Toward Alcohol-Based Hand Sanitizers in Daily Life

Cerrahi Hemşirelerinin Günlük Hayatta Alkol Bazlı El Antiseptikleri Kullanımına Yönelik Tutumlarının Değerlendirilmesi

Naile AKINCI ¹ 

¹ PhD., Department of Nursing, Fenerbahçe University Faculty of Health Sciences, Istanbul, Turkey.

Corresponding author

Naile AKINCI

naileaksit@gmail.com

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ABSTRACT

Aim: This study was conducted to evaluate the attitudes of surgical nurses toward hand sanitizers in daily life.

Materials and Method: The sample of this descriptive study consisted of surgical nurses who lived in Turkey, volunteered for the research and met the inclusion criteria. The sample size calculation was made according to the sample calculation with an unknown population. According to this calculation, the number of samples was determined to be at least 385 at a 95% confidence interval and $\pm 5\%$ sampling error. The online questionnaire created on Google Forms was delivered to 452 participants through social media applications. Information Form was developed by the researcher based on the relevant literature was used as a data collection tool..

Results: Participants reported confusion when selecting disinfectants due to insufficient attention to product content. It was found that although participants are surgical nurses, they lack information on the effective alcohol content of alcohol-based hand sanitizers, the amount to be used, and the duration of hand rubbing.

Conclusion: The significance of conducting studies to raise awareness among nurses on the correct use of hand disinfectants is emerging.

Keywords: Alcohol rubs, Disinfectants, Hand sanitizers, Surgical nurses

ÖZET

Amaç: Bu çalışma, cerrahi hemşirelerinin günlük yaşamda alkol bazlı el antiseptiklerine yönelik tutumlarını değerlendirmek amacıyla yapıldı

Gereç ve Yöntem: Tanımlayıcı tipteki bu çalışmanın örneklemini Türkiye'de yaşayan, araştırmaya gönüllü olan ve dahil etme kriterlerini karşılayan cerrahi hemşireleri oluşturdu. Örneklem büyüklüğü hesaplaması bilinmeyen popülasyonla örneklem hesaplamasına göre yapıldı. Bu hesaplama göre örneklem sayısı %95 güven aralığında ve $\pm 5\%$ örnekleme hatasıyla en az 385 olarak belirlendi. Google Formlar üzerinde oluşturulan çevrimiçi anket, sosyal medya uygulamaları aracılığıyla 452 katılımcıya ulaştırıldı. Veri toplama aracı olarak literatür doğrultusunda araştırmacı tarafından oluşturulan anket formu kullanıldı.

Bulgular: Katılımcıların dezenfektan alırken kafa karışıklığı yaşadıkları, içeriğine pek dikkat etmedikleri belirlendi. Katılımcıların cerrahi hemşiresi olmasına karşın alkol bazlı el dezenfektanlarının etkili alkol içeriği, kullanılacak miktar ve el ovma süresi konusunda bilgi eksikliği yaşadıkları belirlendi.

Sonuç: El dezenfektanlarının doğru kullanımı konusunda hemşirelerin bilinçlendirmeye yönelik çalışmalar yapılmasının önemi ortaya çıkmaktadır.

Anahtar Kelimeler: Alkollü losyonlar, Cerrahi hemşireleri, Dezenfektanlar, El dezenfektanı



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INTRODUCTION

Washing hands with soap and water is the best solution to prevent contamination. Hand sanitizers are used when washing with soap and water is not possible. The purpose of disinfecting hands is; It is to remove contaminant bacteria from hands very quickly and effectively. Approximately 3-5 ml of the fast-acting alcohol-based solution is handled. The hands are rubbed together thoroughly for 2.30 seconds to 1 minute. It is rubbed until the hands are dry, spreading to all parts of the hands and between the fingers (Jing et al., 2020; World Health Organization (WHO), 2009). The COVID-19 pandemic, which emerged in 2019, has shown us the significance of disinfectants and antiseptics to provide hygiene in environments where water and soap are not accessible. In this context, the public health guidelines recommended by WHO emphasize the frequent and correct hand washing with standard hand disinfectants to prevent transmission and reduce the spread of pandemic diseases (WHO, 2020). Based on these protocols and recommendations, the use of alcohol rubs has become very common around the world. While it is true that hand hygiene is the most crucial way to break the chain of infection transmission, the use of appropriate standard formula solutions should be strongly considered.

Hand hygiene is of great importance in reducing surgical site infections, health care costs, labor force, hospital stay and preventing mortality and morbidity. Surgical Clinics, as healthcare professionals who interact with patients, attach great importance to hand hygiene. In the Association of PeriOperative Registered Nurses (AORN) hand hygiene practice guideline, healthcare workers' hands serve as the most common vehicle for the transmission of renewable pathogens from patient to patient. (AORN,2017). Among antiseptics, alcohol-based hand antiseptics are the group that kills microorganisms on the skin most quickly and reduces their numbers most quickly in preventing hospital-acquired infections, and since it is stated that they are as effective as surgical hand washing, they are widely used among surgical nurses (Aygin & Yaman, 2020; Cai, Tyne, Spreckelmeyer, & Williams, 2021; Abdurrahman & Putra, 2024). Alcohol-based hand antiseptics, which have entered our daily lives with the COVID-19 epidemic, have become widespread among nurses in daily life due to their ease of

access and hand habit. Although it is of great importance to use the right disinfectant at the right rate and in the right place for the disinfection process to be effective, wrong practices may occur in this regard. There are not enough studies in the literature evaluate the attitudes of surgical nurses toward hand sanitizers. The research aims to understand the diversity of attitudes and practices among surgical nurses with different demographic and job characteristics.

MATERIAL AND METHOD

Research Type

This study was designed as a descriptive – cross-sectional study.

Study Population and Sample

The population of the study consisted of surgical nurses working in university, public and private hospitals living in Turkey. The sample consisted of nurses who volunteered for the study and met the inclusion and exclusion criteria. The sample size calculation was made according to the sample calculation with an unknown population. According to this calculation, the number of samples was determined to be at least 385 at a 95% confidence interval and $\pm 5\%$ sampling error. The online questionnaire created on Google Forms was delivered to 452 participants through social media applications. The inclusion criteria for this study were those who were aged ≥ 18 years, were literate, had access to the internet and could use it, volunteered to participate in the study and nurses working in surgical units. Exclusions were nurses working temporarily in surgical units, retired nurses.

Time

The study was conducted between September 2021 and April 2022.

Data Collection Tools

Information Form: An information Form was developed by the researcher based on the relevant literature and by consulting 3 expert opinions (1 chemist, 2 academics in nursing) (Suen, So, Yeung, Lo, & Lam, 2019; Aygin & Yaman, 2020; Abdurrahman & Putra, 2024; Ghafoor, Khan, Khan, Ualiyeva, & Zaman, 2021). It consists of 16 items about nurses' sociodemographic (7 items) and alcohol based hand sanitizers attitudes (9 items).

Ethical Consideration

Ethics committee approval was obtained from the clinical research ethics committee of a university (FBU/2020-56). Participants in the research were informed in detail about the research before participation and their consent was obtained. The research was conducted in accordance with Helsinki Declaration.

Data Analysis

The data obtained in the research were evaluated on the SPSS 22.0 statistical software. While evaluating the data, frequencies for categorical variables, and descriptive statistics are given for numerical variables. The Chi-square test was used to compare nonparametric categorical variables. The Chi-square technique tests whether there is a

relationship between two categorical variables. The presence of a relationship between the two variables indicates that the responses at one variable's level differ across the levels of the other variable. In this study, a significance level of $p < 0.05$ was accepted.

RESULTS

Table 1 shows findings about participants' sociodemographic and job characteristics. The mean age of 38.60 ± 15.62 . The participants were, the majority of them were female (82.3%), university graduates (67.7%), and married (60.2%), and most of them had equal income and expenses (52.9%). Most of nurses currently work in clinics (43.6%) and years in service in surgical units >5 year (47.8%).

Table 1: Sociodemographic and job Characteristics of Nurses

Characteristics	n (%)
Age (years)	Mean $\pm$ Sd $38,60 \pm 15.62$
Gender	Female 372 (82.3)
	Male 80 (17.7)
Educational status	High school 82 (18.1)
	University 306 (67.7)
	Master/Doctoral 64 (14.2)
Marital status	Single 180 (39.8)
	Married 272 (60.2)
Income status	Income>expenses 92 (20.3)
	Income=expenses 239 (52.9)
	Income<expenses 121(26.8)
Current working area	Clinics 197 (43.6)
	Surgical intensive care 73 (16.2)
	Operating room 105 (2.2)
	Other 77 (10.4)
Years in service in surgical units	<1 year 112 (24.7)
	1-5 year 124 (27.4)
	>5 year 216 (47.8)

Table 2 shows findings about participants' attitudes toward hand sanitizer. It was determined that participants mostly (46.1%) preferred cologne as hand hygiene material when water and soap were not available and that the majority (33.7%) did not pay attention to the content of the product used, and if the product used contained alcohol, they did not know its percentage (77.2 %). It was determined that most of the participants (84%) thought that the different alcohol percentages of the products were confusing, and 36.9% thought that the percentage of alcohol that had an impact on bacteria and viruses was 60%. It

was found that the majority of the participants often used disinfectants (55.8%), they took more than five ml of disinfectant in their hands at a time (48.7%), >1 min. hand rubbing time (66.4%) and the disinfectant used caused skin problems in 98.7% of them.

Table 2: Nurses' Attitudes Toward Hand Sanitizer

Nurses' Attitudes Toward Hand Sanitizer		n (%)
Preferred hand hygiene material when soap and water cannot be reached	Hand sanitizers	127 (28)
	Wet wipes	80 (17.7)
	Cologne	208 (46.1)
	Other	37 (8.2)
Status of paying attention to the content of the product used	Yes	148 (66.3)
	No	304 (33.7)
If the product used contains alcohol, the status of knowing the percentage of alcohol concentration.	Yes	103 (22.8)
	No	349 (77.2)
Whether the different alcohol percentages of products cause confusion during shopping	Yes	380 (84)
	No	72 (28)
The lowest percentage of alcohol responses acting against bacteria and viruses	50%	30 (6.6)
	60%	167 (36.9)
	70%	145 (32.1)
	80%	54 (12)
	90%	56 (12.4)
Whether the disinfectant used causes skin problems	Yes	446 (98.7)
	No	6 (1.3)
The frequency of disinfectant use	Rarely	88 (19.4)
	Occasionally	112 (24.8)
	Often	252 (55.8)
Average amount of disinfectant taken at a time	1-3 ml	60 (13.3)
	3-5 ml	172 (38)
	>5 ml	220 (48.7)
Average hand rubbing time	>1 mins	300 (66.4)
	< 1 mins	152 (33.6)

*mins=minutes, *ml= milliliter,

Table 3 shows findings about comparison of surgical nurses' some sociodemographic and job characteristics (age, gender, education, income) and their attitudes towards hand sanitizer in daily life. While no significant relationship was found between education level and preferred hand sanitizers and whether hand sanitizers can cause skin problems, it was observed that university graduates and those with master's/doctoral degrees were more likely to respond "yes" to questions about paying attention to product content and knowing the alcohol content in the product compared to high school graduates, and this difference was statistically significant ($p<0.05$). The responses from university and master's/doctoral graduates regarding the most effective alcohol concentration against bacteria and viruses were predominantly 60% and 70%, while high school graduates reported 50%. This result was found to be statistically significant ($p<0.05$). No statistically significant differences were found between groups based on participants' age, gender, income level, and field of work

regarding their responses to the following questions: preferred hand sanitizers (Q1), status of paying attention to the content of the product used (Q2), status of knowing the percentage of alcohol concentration (Q3), confusion caused by different alcohol percentages of products during shopping (Q4), percentage of alcohol responses acting against bacteria and viruses (Q5), whether the disinfectant used causes skin problems (Q6), and frequency of disinfectant use (Q7) ($p>0.05$).

Table 4 shows findings about comparison of surgical nurses' some sociodemographic and job characteristics (marital status, working area, surgical units year) and their attitudes towards hand sanitizer in daily life. No statistically significant differences were found in the responses to questions aimed at determining hand sanitizer usage behaviors in daily life based on participants' marital status and duration of work in the surgical clinic. Although there were no statistically significant differences between groups regarding responses to other variables based on the area of work ($p>0.05$), it was

observed that the response of operating room nurses regarding the question "average amount of disinfectant taken at a time" (Q8) being >5 ml and

"average hand rubbing time" being >1 minute was statistically significant ($p < 0.05$).

Table 3: Comparison of Surgical Nurses' Some Sociodemographic and Job Characteristics and their Attitudes Towards Hand Sanitizer in Daily Life

Nurses' Hand sanitizer attitudes	Characteristics										
	Age			Gender		Education			Income		
	30↓	31-40	41↑	Famale	Male	H.S.	Uni.	Mas/Doc.	In.>Ex.	In.=Ex.	In.<Ex
	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %
Q1											
Hand sanitizers	43	46	38	106	21	28	82	17	28	63	36
	29.7	26.3	28.8	28.5	26.3	34.1	26.8	26.6	30.4	26.4	29.8
Wet wipes	24	34	22	67	13	7	61	12	16	42	22
	16.6	19.4	16.7	18	16.3	8.5	19.9	11.3	17.4	17.6	18.2
Cologne	66	76	66	174	34	41	135	32	39	115	48.1
	45.5	43.4	50.0	46.8	42.5	50.0	44.1	50.0	42.4	54	44.6
Other	12	19	6	25	12	6	28	3	9	19	7.9
	8.2	10.9	4.5	6.7	16.3	7.3	9.2	4.7	9.8	9.9	7.8
X²	5.217 ^a			6.009 ^a		8.222 ^a			2.096 ^a		
p	0.516			0.111		0.222			0.553		
Q2											
Yes	49	58	41	124	248	44	59	45	37	78	33
	338	33.2	31.0	83.8	81.6	14.4	72.0	70.3	40.2	32.6	27.3
No	96	117	111	24	56	262	23	19	55	161	88
	66.2	66.8	69.0	16.2	18.4	85.6	28.0	29.7	59.8	67.4	72.7
X²	3.412 ^a			0.341 ^a		182.413 ^a			1.046 ^a		
p	0.491			0.843		0.000			0.593		
Q3											
Yes	35	36	32	88	15	43	26	34	27	51	25
	24.1	20.6	24.2	23.7	18.8	52.4	8.5	53.1	29.3	21.3	20.7
No	110	139	100	284	65	39	280	30	65	188	96
	75.9	79.4	75.8	76.3	81.2	47.6	91.5	46.9	70.7	78.7	79.3
X²	4.075 ^a			0.907 ^a		145.074 ^a			1.095 ^a		
p	0.396			0.635		0.000			0.579		
Q4											
Yes	115	152	113	316	56	75	249	56	78	202	100
	79.3	86.9	85.6	83.2	77.8	91.5	81.4	87.5	84.8	84.5	82.6
No	30	23	19	64	16	7	57	8	14	37	21
	20.7	13.1	14.4	16.8	22.2	8.5	18.6	12.5	15.2	15.5	17.4
X²	3.701 ^a			1.202 ^a		5.572 ^a			1.291 ^a		
p	0.157			0.273		0.062			0.256		
Q5											
50%	6	15	9	24	6	0	30	0	9	16	5
	4.1	11.6	6.8	6.5	7.5		36.6		9.8	6.7	4.1
60%	51	69	47	137	30	162	5	0	26	95	46
	35.2	39.4	35.6	36.8	37.5	52.9	6.1		28.3	39.7	38.0
70%	50	46	49	115	30	61	25	59	46	66	33
	34.5	26.3	37.1	30.9	37.5	19.9	30.5	92.2	50.0	27.6	27.3
80%	16	25	13	46	8	38	12	4	5	29	20
	11.0	14.3	9.8	12.4	10.0	12.4	14.6	6.3	5.4	12.1	16.5
90%	22	20	14	50	6	45	10	1	6	33	17
	15.2	11.4	16.4	13.4	7.5	14.7	12.2	1.6	6.5	16.5	14.0
X²	8.740 ^a			3.191 ^a		297.209 ^a			7.344 ^a		
p	0.365			0.526		0.000			0.119		

Table 3: Comparison of surgical nurses' some sociodemographic and job characteristics and their attitudes towards hand sanitizer in daily life (continued)

Q6											
Yes	144	173	129	367	79	77	305	64	91	234	121
	99.3	98.9	97.7	98.7	98.8	93.9	99.7	100	98.9	97.9	100
No	1	2	3	5	1	5	1	0	1	5	0
	1.9	1.1	2.3	1.3	1.3	6.1	0.3		1.1	2.1	
X ²	1.396 ^a			0.004 ^a			17.445 ^a			1.361 ^a	
p	0.497			0.947			0.065			0.243	
Q7											
Rarely	26	37	25	69	19	18	19	45	16	47	25
	17.9	34.1	18.9	18.5	23.8	22.0	23.2	54.9	17.4	19.7	20.7
Occasionally	46	34	32	89	23	53	76	177	27	50	35
	31.7	19.4	24.2	23.9	28.7	17.3	24.8	57.8	29.3	20.9	28.9
Often	73	104	75	214	38	17	17	30	49	142	61
	50.3	59.4	56.8	57.5	47.5	26.6	26.6	46.9	53.3	50.4	50.4
X ²	6.518 ^a			2.721 ^a			3.963 ^a			2.163 ^a	
p	0.164			0.257			0.411			0.339	
Q8											
1-3 ml	19	29	13	49	12	14	24	44	14	33	14
	13.1	16.6	9.8	13.2	15.0	17.1	29.3	53.7	15.2	13.8	11.6
3-5 ml	56	71	44	140	31	39	116	151	33	86	52
	38.6	40.6	33.3	37.6	38.8	12.7	37.9	49.3	13.8	36.0	43.0
>5 ml	70	75	75	183	37	8	31	25	45	120	55
	48.3	56.8	56.8	49.2	46.3	12.5	48.4	39.1	11.6	50.2	45.5
X ²	6.642 ^a			0.302 ^a			6.107 ^a			1.099 ^a	
p	0.156			0.860			0.191			0.577	
Q9											
>1 mins	96	114	90	252	120	49	213	38	57	164	79
	66.2	65.1	68.2	84.0	78.7	59.8	69.6	59.4	62.0	68.6	65.3
< 1mins	49	61	42	48	32	32	93	26	35	75	42
	48.1	34.9	31.8	16.0	21.3	40.2	30.4	40.6	37.0	31.4	34.7
X ²	4.372 ^a			2.385 ^a			12.834 ^a			4.890 ^a	
p	0.626			0.496			0.046			0.180	

Q: Question H.S: High School Uni: University Mas./Doc.: Master/Doctorate In./Ex.: Income/Expenses

X²: Ki Kare p: p<0.05**Table 4: Comparison of Surgical Nurses'some Sociodemographic and Job Characteristics and their Attitudes Towards Hand Sanitizer in Daily Life**

Nurses' Hand sanitizer attitudes	Characteristics										
	Marital Status		Working area			Surgical units year					
	S	M	Clinics	S.C.I	O.R	Oth.	<1 year	1-5 year	>5 year		
	n %	n %	n %	n %		n %	n %	n %	n %	n %	
Q1 Hand sanitizers Wet wipes	67	60	57	20		25	25	43	46	38	
	26.6	30.0	28.9	27.4		23.8	32.5	29.6	26.3	26.8	
	40	40	38	15		12	15				
	15.9	20.0	19.3	20.5		11.4	19.5	24	34	22	
Cologne								16.5	19.4	16.7	
	118	90	83	34		59	32	66	76		
	46.8	45.0	42.1	46.6		56.2	41.6	45.6	43.4	66	
										50	
Other	27	10	19	4		9	5	12	19	6	
	10.7	5.0	9.6	5.5		8.6	6.5	8.3	10.9	4.5	
	X ²	6.064 ^a		9.158 ^a			11.090				
	p	0.109		0.423			0.086				
Q2 Yes No	80	68	71	22		36	19	41	41	66	
	31.7	34.0	36.0	30.1		34.3	24.7	36.6	33.1	30.6	
	172	132	126	51		69	58	72	83	150	
	68.3	66.0	64.0	69.9		65.7	75.3	63.4	63.9	69.4	
X ²	1.388 ^a		4.893 ^a			3.452 ^a					
p	0.500		0.558			0.485					

Table 4: Comparison of surgical nurses' some sociodemographic and job characteristics and their attitudes towards hand sanitizer in daily life (continued)

Q3	59	44	49	19	24	11	28	26	49
Yes	23.4	22.0	24.9	26.0	22.9	14.3	25.0	21.0	22.7
No	193	156	148	54	81	66	84	98	167
	76.6	78.0	75.1	74.0	76.1	85.7	75.0	79.0	77.3
X2	1.381 ^a			5.224 ^a			2.950 ^a		
p	0.501			0.515			0.566		
Q4									
Yes	214	166	167	59	91	63	86.	109	185
	84.9	83.0	84.8	80.8	86.7	81.8	76.8	87.9	85.6
No	38	34	30	14	14	14	26	15	31
	15.1	17.0	15.2	19.2	13.3	18.2	23.2	12.1	14.4
X²	0.307 ^a			1.468 ^a			6.200		
P	0.579			0.690			0.045		
Q5									
50%	20	10	14	4	9	3	4	9	17
	7.9	5.0	7.1	5.5	8.6	3.9	3.6	7.3	7.9
60%	92	75	68	33	39	27	42	47	78
	36.5	37.5	34.5	45.2	37.1	35.1	37.5	37.9	36.1
70%	86	59	67	24	31	23	39	36	70
	34.1	29.5	34.0	32.9	29.5	29.9	34.8	29.0	32.4
80%	26	28	19	7	15	13	10	17	27
	10.3	14.0	9.6	9.6	14.3	16.9	8.9	13.7	12.5
90%	28	28	29	5	11	11	17	15	24
	11.1	14.0	14.7	6.8	10.5	14.3	15.2	12.1	11.1
X²	4.239 ^a			10.459 ^a			5.091 ^a		
p	0.375			0.576			0.748		
Q6									
Yes	247	199	195	72	104	75	111	123	212
	98.0	99.5	99.0	98.6	99.0	97.4	99.1	99.2	98.1
No	5	1	2	1	1	2	1	1	4
	2.0	0.5	1.0	1.4	1.0	2.6	0.9	0.8	1.9
X²	1.875 ^a			1.208 ^a			0.872 ^a		
p	0.171			0.751			0.647		
Q7									
Rarely	46	42	37	13	25	13	23	30	35
	18.3	21.0	18.8	17.8	23.8	16.9	20.5	24.2	16.2
Occasionally	64	48	51	17	27	17	35	22	55
	25.4	24.0	25.9	23.3	25.7	22.1	31.3	17.7	25.5
Often	142	110	109	43	53	47	54	72	126
	56.3	55.0	55.3	58.9	50.5	61.0	48.2	58.1	58.3
X²	0.556 ^a			2.906 ^a			0.872 ^a		
p	0.757			0.821			0.647		
Q8									
1-3 ml	25	36	6	17	29	9	16	23	22
	9.9	18.0	5.7	23.3	14.7	11.7	14.3	18.5	10.2
3-5 ml	99	72	45	27	73	26	43	50	78
	39.3	36.0	42.9	37.0	37.1	33.8	38.4	40.3	36.1
>5 ml	128	92	54	29	95	42	53	51	116
	50.8	46.0	51.4	39.7	48.2	54.5	47.3	41.1	53.7
X²	6.238 ^a			13.304 ^a			7.148		
p	0.044			0.038			0.128		
Q9									
>1 mins	172	128	94	59	119	48	78	85	137
	68.3	64.0	89.5	80.8	60.4	62.3	69.6	68.5	63.4
< 1mins	80	72	11	14	78	29	34	39	79
	31.7	36.0	10.5	19.2	39.6	37.7	22.7	31.5	36.6
X²	2.937 ^a			65.396 ^a			5.357 ^a		
p	0.402			0.000			0.499		

Q: Question S: Single M: Married S.I.C : Surgical intensive care O.R :Operating Room Oth: Other X²:Ki Kare
X2:Ki Kare p: p<0.05

DISCUSSION

The findings on individuals' attitudes toward hand sanitizers indicated that participants most often preferred cologne as the hand hygiene material when water and soap could not be reached. This may be due to its ease of access, cheapness, and the fact that it is a traditional hand hygiene practice. The result of our research is consistent with the study by Uğurlu, Durgun, Nemutlu, and Kurd (2020), in which it was determined that cologne (28.0%) was used at the highest rate for hand hygiene after soap and water.

In the study, it was determined that the majority of participants did not pay attention to the content of the product used, and if the product used contained alcohol, they did not know the most effective lowest percentage of alcohol concentration. They thought that 60% alcohol was enough to kill bacteria and viruses. In a study by Suen et al. (2019), about half of the respondents stated that 40% alcohol was enough for hand disinfection. In the study of Czeisler et al. (2020), it was determined that hand disinfectants (70.7%) were used the most after hand washing. Study by Rivera et al. (2020), it was determined that participants did not check the contents of the disinfectants and did not use them in accordance with the labels. Unlike our study, in the study of Ghafoor et al. (2021), it was observed that the majority of individuals (86%) bought disinfectants by reading their labels. This difference in the results of studies may be due to participants' cultural, job characteristics and sociodemographic differences. Also, in this study, it was determined that the participants who reported that 70% alcohol is effective in killing bacteria and viruses were predominantly university graduates and nurses with master's or doctoral degrees (Table 3). This result can be explained by the fact that these nurses are more likely to follow scientific literature, have received more education about the importance of hand hygiene, and are aware of their responsibility as health professionals to serve as role models in the community. The study found that as participants' education levels increased, their curiosity about product ingredients and their tendency to check the alcohol content of products also increased (Table 3). This result can be explained by the increased pursuit of knowledge among nurses as their education level rises, the improvement of health awareness, and the reflection of this awareness in their consumption habits. Similarly,

in the study conducted by Ötün, Yüceyurt, and Şenyuva in 2022, it was determined that as nurses' education levels increased, their willingness to learn improved. Additionally, their critical thinking skills also enhanced.

Unconscious use of disinfectants can cause many adverse effects, such as resistance to antibacterial effects, allergic reactions, poisoning, and skin problems. In addition, unnecessary consumption causes an economic burden. In the study, it was determined that the majority of participants frequently used disinfectants (48.8%) (Table 1). This may be due to efforts to protect against COVID-19, lack of water and soap everywhere, and ease of use. In the study of Türkmen, Ceylan and Topuz, (2021) on "the knowledge of emerging adults about COVID-19 and the changes in their lives," it was determined that the majority of the participants (66.4%) had a disinfectant with them wherever they went and constantly cleaned their hands and surfaces before contact. In their study on surgical nurses and doctors, Lamping, Tomsic, Stolz, M, Chaberry, and Lengerke, (2022) determined that hand hygiene compliance increased during the COVID-19 pandemic. In another study, it was determined that nurses' hand hygiene practices increased during the COVID-19 period compared to before (Zhang et al., 2023). Likewise, in their study, it was determined that nurses used hand antiseptics more during COVID-19. In the present study, it was determined that the disinfectant used by 51.1% of participants caused skin problems. In the study by Uğurlu, Durgun, Nemutlu, and Kurd, (2020), a statistically significant positive correlation was found in terms of the development of skin problems in those who used hand disinfectants during hand washing. In a study by Korkmaz & Taşdemir (2010) on operating room nurses, it was determined that 86% of them experienced dry hands.

Effective infection prevention requires the use of products in appropriate volume to ensure both full coverage of hands and enough time to keep the hands wet for maximum effect. However, it is widely accepted that the volume of alcohol-based hand sanitizers recommended for use by manufacturers should be adequate to pass the standard in-vivo efficacy test and typically EN-1500. In general, even highly effective formulations require a minimum of three ml to meet the test standard. It is not known whether three ml is enough for meeting the 20-30-second wet time requirement of the WHO (Wilkinson

Ormandy, Bradley, Fraise, & Hines, 2017; Rodrigues et al., 2016; Jing et al; 2020). Wilkinson et al. (2017), found that the optimum volume for hand hygiene was between 1.5 and 2 ml. In the study, it was determined that participants (52.8%) took more than five ml of disinfectant in their hands at a time (Table 1). In the study, it was found that operating room nurses used more than 5 ml of hand antiseptic and had a rubbing time of over 1 minute, with a significant difference between the groups (Table 4). This may be attributed to the reflection of the surgical handwashing practices of operating room nurses in their daily lives. The reason for this result can be explained by the stress, panic, and lack of knowledge about the use of disinfectants. Consistent with the result of our study, in a study by Taylor et al. (2020a), one of the factors corresponding to the COVID-19 stress syndrome in the reliability study of the COVID-19 Stress Scale was determined as fear of contact with contaminated fomites (i.e., objects, surfaces). In another study conducted by Taylor et al. (2020a), with 6,854 participants, it was found that stress reactions associated with COVID-19 were more complex than a simple one-dimensional fear of infection and that COVID-19 stress syndrome (psychological and emotional strain caused by the fear, anxiety, and challenges related to the COVID-19 pandemic) was a complex phenomenon that included features, such as various types of fear, seeking control and reassurance, re-experiencing symptoms, as well as excessive avoidance and anxiety and panic buying (the act of purchasing large quantities of goods in response to fear or uncertainty, often leading to shortages) (Taylor et al., 2020b). Wang et al. (2022), a meta-analysis determined that healthcare workers approach hand hygiene with fear and psychological pressure brought on by the spread of COVID-19.

Limitation

It may be difficult to select a sample that is representative of all surgical nurses working in different hospitals across Türkiye. In particular some smaller hospitals or healthcare facilities in remote areas may not have been included in the sample, which may limit generalization of the results to the entire country. The collection of study data during the COVID-19 pandemic period affected the results.

CONCLUSION

It was determined that participants were confused while purchasing disinfectants, they did not pay much attention to the content, and there were errors in the information regarding the use of disinfectants. Additionally, it was observed that as the education level increased, nurses provided more accurate and informed responses to questions aimed at measuring their attitudes towards hand disinfectants.

Hand washing with soaps and the use of hand sanitizers have increased during the COVID-19 pandemic. The global hand sanitizer market is expected to grow further in the coming days. The significance of conducting studies to raise nurses' awareness regarding the correct use of disinfectants of hand disinfectants is emerging. There is a need to conduct larger-scale studies on this subject in different countries. It is recommended that the study be repeated after the COVID-19 period.

Ethics Committee Approval

Ethics committee approval was received for this study from the Fenerbahçe University Clinical Research Ethics Committee (Date: 20.12.2020, Approval Number: /FBU/2020-56).

Author Contributions

Idea/Concept: N.A.; Design: N.A.; Supervision/Consulting: N.A.; Analysis and/or Interpretation: N.A.; Literature Search: N.A.; Writing the Article: N.A.; Critical Review: N.A.

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Conflict of Interest

The authors have no conflict of interest to declare.

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REFERENCES

- Aygin, D., Yaman, Ö. (2020). The role and importance of hand washing techniques in preventing surgical site infections. *Sakarya Medical Journal*, 10 (3), 520-527. doi:10.31832/smj.685160.
- Abdurrahman, A., Putra, A. (2024). Nurses' knowledge and attitudes towards hand hygiene in Aceh, Indonesia: A correlational study among surgical nurses. *International Journal of Advanced and Applied Sciences*, 11 (2), 212-218.
- Bellissimo-Rodrigues, F., Soule, H., Gayet-Ageron, A.,

- Martin, Y., Pittet, D. (2016). Should alcohol-based handrub use be customized to healthcare workers' hand size?. *Infection Control & Hospital Epidemiology*. Cambridge University Press, 37, 219-21. doi:10.1017/ice.2015.271
- Cai, H., Tyne, I. A., Spreckelmeyer, K., Williams, J. (2021). Impact of visibility and accessibility on healthcare workers' hand-hygiene behavior: A comparative case study of two nursing units in an academic medical center. *HERD*, 14(2), 271–288. doi: 10.1177/1937586720962506
- Czeisler, M. E., Williams, A. G. G., Molinari, N. A., Gharpure, R., Li, Y., Barrett, C. E., ... Howard, M. E. (2020). Demographic characteristics, experiences, and beliefs associated with hand hygiene among adults during the COVID-19 pandemic. *CDC*, 69, 1485-1491. doi:10.15585%2Fmmwr.mm6941a3
- Cruz, A. F., Abreu, A. O., Souza, P. A. (2022). Adaptation and validation of a method for evaluating the bactericidal activity of ethyl alcohol in gel format 70% (w/w). *Journal of Microbiological Methods*, 193, 106402. doi:10.1016/j.mimet.2021.106402.
- Jing, J. L. J., Yi, T. P., Bose, R. J. C., McCarthy, J. R., Tharmalingam, N., Madhewaran, T. (2020). Hand sanitizers: a review on formulation aspects, adverse effects, and regulations. *Int. J. Environ. Res. Public Health*, 17, 3326. doi: 10.3390/ijerph17093326
- Goldberg, J. L. (2017). Guideline Implementation: Hand hygiene. *AORN Journal*, 105 (2), 203-212.
- Ghafoor, D., Khan, Z., Khan, A., Ualiyeva, D., Zaman, N. (2021). Excessive use of disinfectants against COVID-19, which poses a potential threat to living things. *Current Research in Toxicology*, 2, 159-168. doi: 10.1016/j.crttox.2021.02.008.
- Korkmaz, F.D., Taşdemir, N. (2010). Investigation of surgical hand washing practices of operating room nurses. *Ege Üniversitesi Hemşirelik Yüksek Okulu Dergisi*, 26 (3), 33-43.
- Lamping, J., Tomsic, I., Stolz, M., Chaberry, I. F., Lengerke, T.V. (2022). Do task and item difficulty affect overestimation of one's hand hygiene compliance? A cross-sectional survey of physicians and nurses in surgical clinics of six hospitals in Germany. *Antimicrob Resist Infect Control*, 11, 147. doi: 10.1186/s13756-022-01188-7.
- Ötün, T., Küçük Y. N., Akçin Ş. E. (2022). The Relationship Between Nurses' 21st Century Skills and Self-Learning Readiness. *Hacettepe University Faculty of Health Sciences Journal*, 9(3), 716-737. doi: 10.21020/hsbfd.1085324
- Rivera, J. M., Gupta, S., Ramjee, D., El Hayek, GY, El Amiri, N., Desai, A. N. (2020). Evaluating interest in off-label use of disinfectants for COVID-19 with Google trends. *The Lancet Digital Health*, 2, 564-566.
- Suen, L. K. P., So, Z. Y. Y., Yeung, S. K. W., Lo, K. Y. K., Lam, S. C. (2019). Epidemiological investigation on hand hygiene knowledge and behaviour: a cross-sectional study on gender disparity. *BMC Public Health*, 19, 401. doi: 10.1186/s12889-019-6705-5
- Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., Asmundson, G. J. G. (2020a). COVID stress syndrome: Concept, structure, and correlates. *Depression and Anxiety*, 37, 8706-714. doi:10.1002/da.23071.
- Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., Asmundson, G. J. G. (2020b). Development and initial validation of the COVID Stress Scales. *Journal of Anxiety Disorders*, 72, 102232. doi:10.1016/j.janxdis.2020.102232
- Türkmen, A. S., Ceylan, A., Topuz, A. (2021). Emerging adults' information on COVID-19 and changes in their lives. *Health Sciences Medical Journal*, 8,2. doi:10.21020/hsbfd.841364
- Uğurlu, Y. K., Durgun, H., Nemutlu, E., Kurd, O. (2020). Assessment of individuals' knowledge and attitude of social hand washing during COVID-19 pandemic: The case of Turkey. *Journal of Contemporary Medicine*, 10, 617-624. doi:10.16899/jcm.745349.
- Wang, Y., Yang, J., Qiao, F., Feng, B., Hu, F., Xi, Z. A., Wu, W., ... Yuan, Y. (2022). Compared hand hygiene compliance among healthcare providers before and after the COVID-19 pandemic: A rapid review and meta-analysis. *Am J Infect Control*, 50 (5), 563-571. doi: 10.1016/j.ajic.2021.11.030
- Wilkinson, M. A. C., K, Ormandy., Bradley, C. R., Fraise, A. P., Hines, J. (2016). Dose considerations for alcohol-based hand rubs. *Journal of Hospital Infection*, 95, 175-182. doi: 10.1016/j.jhin.2016.12.023
- World Health Organization. (2009). Hand hygiene: why, how and when?. 19.08.2024, http://www.who.int/gpsc/5may/Hand_Hygiene_Why_How_and_When_Brochure.pdf.
- World Health Organization. (2020). Coronavirus Disease (COVID-19) advice for the public. 07.12.2021, <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>.
- Yusuf, A. A. (2021). Determination of alcohols in hand sanitisers: Are off-the-shelf hand sanitisers what they claim to be?. *South African Journal of Science*, 117, 11-12. doi:10.17159/sajs.2021/9328
- Zhang, X., Ma, Y., Kong, L., Li, Y., Wang, J., Li, N., ... Men, X. (2023). The impact of COVID-19

pandemic on hand hygiene compliance of healthcare workers in a tertiary hospital in East China. *Front Med (Lausanne)*,10,1160828. doi: 10.3389/fmed.2023.1160828.