



THE MANUAL DEXTERITY OF NURSES AND FACTORS THAT AFFECT IT.

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Introduction

- Nursing is a branch of arts and sciences that requires the comprehension and application of special knowledge and skills in order to provide comprehensive patient care and professional nursing practices; based on cultural and professional knowledge, clinical and conceptual skills, and the individual's system of values

Introduction

- In the literature, there are studies on manual dexterity and factors affecting it in many professions that require hand and eye coordination.

Introduction

- In the field of nursing, adequate work has not been achieved in this regard.
- However, in professions such as nursing where hand manipulation is used, the level of development of individuals' dexterity and dexterity is important.

Introduction

- o Considering that skills that require hand, eye and coordination are an important part of nursing practices, determining the factors affecting manual dexterity and dexterity in gaining and developing psychomotor skills, organizing education activities of nurses, increasing education quality and improving the quality of care and nurses' manual dexterity.
- o It is believed that it will guide further research to be planned in line with the data.

Aim

- o The purpose of this descriptive and analytical study was to define the manual dexterity of nurses and factors that affect it.

Methodology

Study design and sample

- o This research is a descriptive and analytical study.
- o The population of the research consisted of 400 nurses working in a training and research hospital in the southern region of Turkey.

Methodology

Study design and sample

- o In this research, a sample size of 95% reliability level was estimated using “G. Power-3.1.9.2” computer program.
- o Based on the study by Kuzgun and Denat (2020), the effect size was calculated as 0.53, α value $\alpha=0.05$, and the total sample size 90 to attain a power level of 0.80.
- o Taking into account the sample losses, the study was completed with 96 nurses volunteering to participate in the study.

The Data Collection Tools

- o The data collection tools were a survey and the Purdue pegboard test.

The Data Collection Tools

The survey

The survey consisted of two parts;

- o **The first part** contains introductory information about the participant and questions concerning the factors which are thought to affect manual dexterity.
- o **The second part** includes the Purdue Pegboard Test results.

The Data Collection Tools

The survey

- Introductory information and questions concerning the factors that are thought to affect manual dexterity include age, gender, educational status, the clinic worked in, working experience, dominant hand, the status of suffering from a chronic disease, the status of medication use, existence of a physical case that cause a finger loss or holding and gripping problem, having a hobby, doing sports, the status of voluntarily choosing the profession, and satisfaction with the profession.

The Data Collection Tools

Purdue pegboard test

- o The Purdue pegboard test was developed by Tiffin and Asher for measuring manual dexterity.
- o Validity and reliability studies concerning the test have been completed.

The Data Collection Tools

Purdue pegboard test

- o The test comprises five subtests: (a) right hand; (b) left hand; (c) both hands; (d) right+left+both hands; (e) assembly.
- o The test board consists of a board with four cups across the top and two vertical rows of 25 small holes to the center.
- o The two outside cups contain 25 pins each; the cup at the immediate left of the center contains 40 washers and the cup at the right of the center contains 20 collars.

The Data Collection Tools

Purdue pegboard test



Data collection

- Before the data collection process, nurses were informed about the aim of the study.
- The survey was conducted through a face-to-face interview.
- Purdue Pegboard Test is based upon the principle of applying manual skills in a certain time interval.
- It measures two kinds of skill.
- The first is the gross motions of the whole hand, fingers, and arms; the other one is the fine manual dexterity which is required in the assembly tasks.

Data collection

- o The application comprises 4 stages: right hand, left hand, both hands, and the assembly.
- o In general, at the end of the application 4 distinct scores are obtained: right-hand score, left-hand score, both hands score, right hand + left hand + both hands score, and assembly score.
- o The performance of the right-hand subtest requires participants to place as many pins as possible within 30 seconds using their right hands.
- o The left-hand phase is also the same. The score of each of these subtests is the total number of pins placed by each hand within the given time.

Data collection

- o Both hands subtest is a bimanual test where the participants use both hands simultaneously to place as many pins as possible in both rows in 30 seconds.
- o The score of this subtest is the total number of pairs of pins placed in 30 seconds.
- o For the right hand + left hand + both hands score there is no separate test, it is the arithmetical sum of the scores of the right hand, left hand and both hands subtests.

Data collection

- o The assembly phase comprises the placement of a nail, washer, ring, and a washer again into a gap.
- o The score of this subtest is the total number of pins, washers, and rings placed using both hands simultaneously in 60 seconds.
- o Each phase is repeated three times.
- o The mean scores for each subtest consist of the average scores of these 3 applications.

Statistics

- o The data were assessed using SPSS version 18.0.
- o Since the data showed normal distribution, T-test for independent groups, One-way Analysis of Variance (ANOVA) and Pearson Correlation Analysis were also used for data analysis.
- o For the results, we accepted $p < 0.05$ as statistically significant.

Ethics Approval

- To conduct the study, we obtained approval from the Adnan Menderes University Faculty of Medicine Noninterventional Clinical Research Ethical Committee (approval no: 53043469-050.04.04) and the informed consent forms were signed earlier to include the research participants.

Results

The mean age of the nurses participating in the study was 27.48 ± 4.52 ,

67.7% of the nurses were female,

84.4% had bachelor's degree,

38.5% were working in Surgical Service,

had an average working experience of 60.29 ± 47.95 months (approximately 5 years)

88.5% of the nurses used their right hand predominantly,

71.9% of them did not have a chronic disease,

89.6% of them did not use medication regularly.

Results

None of the nurses had a physical problem that would affect their ability to hold and grasp such as finger loss, injury, etc.

64.6% did not have any hobbies,

71.9% did not do sports,

46.9% of the nurses stated that they preferred the nursing profession voluntarily,

53.1% stated that they were satisfied with their profession.

Results

Nurses were determined to work for an average of 7.12 ± 3.12 hours a day when the Purdue Pegboard Test was applied.

The mean dexterity scores of the nurses were;

18.82 ± 1.37 for the dominant hand,

17.14 ± 1.42 for the non-dominant hand,

14.64 ± 1.30 for both hands,

50.61 ± 3.64 for right + left + both hands,

41.26 ± 6.92 for assembly skill.

Table 1. Comparison of the Characteristics of Nurses with their Purdue Pegboard Test Scores

Characteristics	n	Phase of test									
		Dominant hand		Non-dominant hand		Both hands		Right hand + left hand + both hands		Assembly	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Gender											
Female	65	19.02	1.40	17.38	1.40	14.89	1.25	51.32	3.57	42.37	6.59
Male	31	18.39	1.20	16.64	1.34	14.10	1.26	49.14	3.38	38.94	7.12
t / p		t=2.15, p= 0.03		t=2.44, p= 0.01		t=2.90, p= 0.00		t=2.83, p= 0.00		t=2.32, p= 0.02	
Educational Status											
Vocational High School of Health	15	18.53	1.18	17.08	1.59	14.53	1.03	50.26	3.47	39.77	5.08
Bachelor Education	81	18.87	1.40	17.15	1.39	14.66	1.35	50.68	3.68	41.53	7.20
t / p		t=-0.18, p=0.37		t= -0.17, p = 0.86		t=-0.36,p= 0.71		t = -0.40, p= 0.68		t=-0.90 , p= 0.36	
Currently Working Clinic											
Intensive care	33	18.69	1.28	17:05	1.45	14.71	1.39	50.47	3.62	40.95	6.31
Internal Clinics	37	18.81	1.44	17.21	1.30	14.54	1.29	50.61	3.61	41.37	7.77
Surgical Clinics	26	18.99	1.40	17.15	1.57	14.68	1.24	50.81	3.83	41.49	6.60
F / p		F=0.35,p= 0.70		F=0.10,p= 0.90		F=0.16,p= 0.84		F=0.06,p= 0.93		F=0.05, p=0.95	
Choosing the nursing profession willingly											
Yes	45	18.52	1.39	16.98	1.36	14.47	1.22	49.99	3.44	39.95	6.36
No	26	18.86	1.29	16.86	1.43	14.52	1.31	50.29	3.55	41.80	7.30
Partially	25	19.30	1.32	17.71	1.40	15.06	1.38	52.07	3.80	43.06	7.27
F / p		F=2.67,p= 0.07		F=2.92, p=0.05		F=1.80, p=2.87		F=2.87, p=0.06		F=1.76 ,p=0.17	
Being satisfied with the nursing profession											
Yes	51	18.87	1.36	17.32	1.21	14.74	1.23	50.95	3.27	41.08	7.13
No	16	18.95	1.14	17.33	1.40	14.72	1.63	51.03	3.85	42.26	6.68
Partially	29	18.66	1.52	16.71	1.70	14.42	1.24	49.80	4.11	41.02	6.86
F / p		F=0.30, p=0.73		F=1.96, p=0.14		F=0.58, p=0.55		F=1.04, p=0.35		F=0.19, = 0.82	
Having a hobby											
Yeah	34	18.52	1.17	16.71	1.33	14.36	1.18	49.63	3.27	39.26	7.48
No	62	18.98	1.45	17.37	1.42	17.79	1.34	51.15	3.74	42.35	6.39
t / p		t=-1.58, p=0.11		t =-2.24, p =0.02		t=-1.53, p=0.12		t = -1.99, p=0.04		t=-2.12, p= 0.03	
Doing Sports											
Yes	27	18.81	1.39	17.18	1.59	14.60	1.05	50.57	3.65	39.99	7.36
No	69	18.82	1.37	17.12	1.36	14.65	1.39	50.63	3.66	41.76	6.72
t / p		t=-0.04, p=0.96		t=0.16, p= 0.86		t=-0.18, p=0.85		t=-0.06, p=0.94		t=-1.12 , p=0.26	

Results

According to the results of the study, all kinds of mean dexterity scores of female participants were found to be significantly higher than the male, and those who did not have a hobby were found to have higher non-dominant hand, right + left + both hands, and assembly mean scores ($p < 0.05$)

Table 2. The relationship between the characteristics of nurses and Purdue Pegboard mean scores

	Dominant hand		Non-dominant hand		Both hands		Right hand + left hand + both hands		Assembly	
	r	p	r	p	r	p	r	p	r	p
Age	-0.18	0.07	-0.15	0.13	-0.22	0.02	-0.21	0.03	-0.24	0.01
Working year as a nurse	-0.21	0.03	-0.17	0.09	-0.23	0.01	-0.23	0.02	-0.31	0.00
BMI	-0.34	0.00	-0.16	0.11	-0.23	0.02	-0.28	0.00	-0.31	0.00
Working duration when the test was applied	-0.14	0.16	-0.10	0.29	-0.17	0.08	-0.15	0.12	-0.15	0.14

Results

A negative correlation was found between the dominant hand mean scores and working duration as a nurse ($r=-0.21$), as well as BMI ($r=-0.35$).

No significant correlation was found between the non-dominant hand dexterity, age, working duration as a nurse, and BMI.

A negative correlation was found between both hands dexterity mean scores, age ($r=-0.22$), working duration as a nurse ($r=-0.24$), and BMI ($r=0.24$).

A negative correlation was found between the mean scores of right + left + both hands dexterity, age ($r=-0.22$), working duration as a nurse ($r=-0.24$), and BMI ($r=-0.28$).

A negative correlation was found between the mean scores of assembly skill, age ($r=-0.24$), working duration as a nurse ($r=-0.31$), and BMI ($r=-0.31$).

Conclusion

- o As the conclusion of this study;
- o gender, not having a hobby were found to affect the manual dexterity,
- o certain kinds of manual dexterity were determined to decrease as the age, years of working as a nurse, and BMI increase.

Conclusion

- According to the results of the study, the assignment of female, young nurses with normal (or below) body mass index could be recommended in jobs that require manual dexterity more.
- The results of this study might constitute normative data for future studies on the subject.
- In addition, repeating the study with nurses having longer-term work experience and working in different institutions could also be recommended.

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