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Research Article

DELIRIUM AND RELATED FACTORS IN PATIENTS HOSPITALIZED IN THE INTERNAL INTENSIVE CARE UNIT

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Abstract: *This study was conducted to examine delirium and its associated factors in patients hospitalized in the internal intensive care unit. The study was conducted in the internal medicine intensive care unit of the University of Health Sciences, Gazi Yaşargil Training and Research Hospital between July 2022 and February 2023. The sample consisted of 103 patients admitted to the internal intensive care unit. Data were collected using the Patient Information Form, Glasgow Coma Scale (GCS), the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), the Nursing Delirium Screening Scale (Nu-DESC), and the Standardized Mini-Mental Test (SMMT). There were statistically significant differences found in SMMT scores across age groups ($F=4.376$; $p<0.01$). Nu-DESC scores varied significantly according to education levels ($\chi^2=12.504$; $p<0.01$). There were significant differences in SMMT scores were observed based on cohabitation status ($Z=-2.246$; $p=0.025$). Nu-DESC scores differed significantly based on nasogastric tube (NG) use ($Z=-2.316$; $p=0.021$), and SMMT scores also showed significant differences concerning NG use ($Z=-2.695$; $p=0.007$). A negative, moderate, and statistically significant correlation was found between Nu-DESC and SMMT scores ($r=-0.617$; $p<0.001$). This study identified age, education level, cohabitation status, and nasogastric tube use as factors associated with delirium in patients hospitalized in the intensive care unit. A significant relationship was also found between Nu-DESC and SMMT scores. As delirium is a multifactorial syndrome, understanding the factors predisposing patients to delirium is crucial for its prevention. Therefore, it is recommended to develop educational programs for early identification of delirium and to monitor patients for signs of delirium.*

Keywords: *Delirium, İntensive care unit,Patients, Nursing*

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1. Introduction

The Intensive Care Unit (ICU) stands out from other hospital departments providing treatment and care due to its unique therapeutic procedures, monitoring tools and equipment, physical factors, and sensory environment [1]. During their stay in the ICU, patients often experience discomfort due to their illness while also being separated from family and friends. This situation can lead to more pronounced psychological, physical, and environmental issues than those the patient has previously encountered. As a result, critically ill patients admitted to an intensive care unit may develop delirium, also known as acute confusional state, intensive care syndrome, or intensive care psychosis [2].

Delirium is generally reversible but presents as an acute syndrome affecting the brain. It is considered to be an altered state of mind between a coma or stupor at one end and a normal state of wakefulness at the other [3]. Approximately 80% of patients observed in the ICU exhibit sudden changes

in mental status, accompanied by agitation, attention deficits, disorganized thinking, and cognitive alterations [4]. Keeping a critically ill individual in a stress-laden environment has been shown to exacerbate delirium and its clinical manifestations [5]. Delirium affects at least 1 in 6 elderly hospitalized patients. While the condition is typically short-lived and improves over time, it persists for weeks or months in nearly 20% of cases. The hallmark symptom of delirium is brief episodes of inattention. It is characteristic of disorientation (awareness of time, place, and person), impaired alertness, memory deficits, visual misinterpretation, perceptual errors, delusions, hallucinations, increased hyperactivity, and disordered thought processes [6].

Delirium is associated with a significant increase in the length of stay in hospital, the rate of readmission to hospital, and mortality [7]. Despite often being detected late, it significantly contributes to morbidity and mortality in affected patients [8]. A cohort study involving patients diagnosed with delirium reported a mortality rate of 39% within one year [9]. Generally, between 25% and 78% of ICU patients, regardless of whether they experience delirium, face cognitive impairments following discharge, highlighting the need for greater attention during the post-critical illness period [10]. These cognitive impairments can persist in some patients for up to six months after hospitalization [11].

Delirium is a common and serious problem in patients admitted to intensive care units and is associated with poorer short-term outcomes such as increased mortality in intensive care units and in hospitals, longer duration of mechanical ventilation and longer hospital stays [12]. Pharmacological treatment for delirium has proven insufficient, necessitating the development and implementation of physical and cognitive rehabilitation programs as additional strategies to improve delirium-related outcomes in hospital settings [13,14].

A range of non-pharmacological interventions has been developed to prevent delirium in hospitalized patients. Many of these adopt a multifactorial approach, involving protocols, training, or system redesign. Nursing practices also include evaluating and modifying medications, promoting mobilization, and enhancing the patient's environment [15].

When delirium occurs in ICU patients, it leads to adverse outcomes such as self-extubation, removal of catheters, prolonged hospital stays, higher mortality rates, and, consequently, increased healthcare costs. Identifying and preventing delirium as part of routine nursing care in the internal ICU is essential for reducing morbidity and mortality. This study was conducted to examine delirium and its associated factors in patients hospitalized in the internal intensive care unit.

2. Materials and Methods

2.1. Research Type

This descriptive study aimed to examine delirium and its associated factors in patients hospitalized in the internal intensive care unit.

2.2. Population and Sample

The research was conducted between July 2022 and February 2023 at the Gazi Yaşargil Training and Research Hospital, affiliated with the University of Health Sciences. The study sample consisted of patients admitted to the intensive care unit during the specified dates who met the inclusion criteria. The sample size was determined using the G*Power 3.0.10 software. Based on the power analysis, a sample size of 90 was deemed sufficient, with a 95% confidence interval, an effect size of 0.6, and a 5% margin of error. To account for potential dropouts or losses, 103 patients were included in the final sample [16]. Patients were eligible for the study if they were over 18 years of age, able to communicate, had been hospitalized in the intensive care unit for at least 48 hours, and had no neurological or psychiatric conditions. Inclusion also required that the patients met the first and second features, as well as the third

or fourth features, of the CAM-ICU assessment and had a total GCS score of 10 or higher. Patients who did not meet these criteria were excluded from the study.

2.3. Data Collection Tools

The data for this study were collected using the Patient Information Form, the Glasgow Coma Scale (GCS), The Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), the Nursing Delirium Screening Scale (Nu-DESC), and the Standardized Mini-Mental Test (SMMT).

Patient Information Form: Patient Information Form: The form prepared by the researchers is based on a review of the relevant literature [17, 18]. It is designed to collect socio-demographic data, such as age, gender, marital status, education level, cohabitation status, number of comorbid conditions, and multiple drugs. The form also investigates potential delirium triggers, including substance use (smoking, alcohol), use of prosthetics, vision and hearing impairments, mode of ICU admission, use of central venous catheters (CVC), Foley catheters, nasogastric (NG) tubes, and oral intake disorders.

Glasgow Coma Scale (GCS) was developed by Teasdale and Jennett in 1974 and has become a widely used international tool for assessing comatose patients [19]. It allows for the rapid identification of changes in a patient's level of consciousness. GKS score varies between 3 and 15. A score of 13–15 indicates full consciousness, while scores below 8 indicate a comatose state [20]. For this study, only patients with a GCS score of 10 or higher were included, as they are considered at risk for developing delirium and were thus eligible for evaluation.

The Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) was developed by Ely and colleagues in 2001, with its Turkish validity and reliability study completed by Akıncı and colleagues in 2005 [21, 22]. The CAM-ICU evaluates four key features: an acute onset or fluctuating course of cognitive processes, difficulty in focusing and maintaining attention, disorganized thinking or distorted thought processes, and alterations in cognitive functions. If features 1 and 2 are present along with either feature 3 or 4, the assessment is considered positive for delirium. The CAM-ICU is a quick evaluation tool, requiring an average of two minutes to complete. Its Cronbach's alpha internal consistency coefficient is 0.96 (22), while in this study, it was calculated as 0.73. Patients were assessed once daily using the CAM-ICU, and those meeting the criteria for features 1 and 2, along with either feature 3 or 4, were categorized as having delirium.

The Nursing Delirium Screening Scale (Nu-DESC) is a tool developed by Gaudreau and colleagues in 2005 [23]. Its Turkish adaptation was conducted by Karataş and colleagues in 2019 [18]. Nu-DESC score varies between 0 and 10. Patients who score 2 or higher are classified as having "delirium." The Nu-DESC has a Cronbach's alpha internal consistency coefficient of 0.74 (18). In this study, the Cronbach's alpha coefficient for Nu-DESC was found to be 0.83. Patients were evaluated once daily during working hours using the Nu-DESC, and those with scores of 2 or higher were defined as having "delirium."

The Standardized Mini-Mental Test (SMMT) was developed by Folstein and colleagues in 1975 to assess the degree of cognitive impairment (24). The Turkish validity and reliability study was conducted by Güngen and colleagues in 2002, and the test has since been used as the Standardized Mini-Mental Test (SMMT) in Turkey [25]. A total score of 23 or below indicates cognitive impairment. The maximum score is 30, with scores between 21–23 suggesting mild cognitive impairment, and scores of 20 or below indicating moderate to severe cognitive impairment. The Cronbach's alpha internal consistency coefficient for the SMMT is 0.92 [25]. In this study, the Cronbach's alpha coefficient was determined to be 0.78. Patients were evaluated once daily during working hours, and scores of 23 or

below were considered indicative of cognitive impairment, classifying the patient as being at risk for delirium.

2.4. Data Collection

The data for this study were collected between July 2022 and February 2023 from patients hospitalized in the internal intensive care unit of the Gazi Yaşargil Training and Research Hospital, affiliated with the University of Health Sciences. These patients volunteered to participate in the study and met the inclusion criteria. After being informed about the study, patients provided both verbal and written consent. The data collection tools included the Patient Information Form, which captured descriptive characteristics of the patients; GCS, which assessed consciousness levels; Nu-DESC, which identified delirium and clinical features; CAM-ICU, which assessed patients at high risk of delirium; and SMMT, which evaluated the impact of cognitive impairment. Surveys were administered by the researcher to patients who had been in the ICU for at least 48 hours.

2.5. Ethical Considerations

Permission to use the scales employed in this study was obtained from their respective authors. Ethical approval for the study was secured from the Ethics Committee of Gazi Yaşargil Training and Research Hospital, affiliated with the University of Health Sciences. (Date: 22.7.2022; Number:137). Additionally, institutional approval was obtained from the Gazi Yaşargil Training and Research Hospital to conduct the research.

2.6. Evaluation of Data

The collected data were analyzed using IBM SPSS Statistics 26. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the data. For comparisons of measurement values between two independent groups, the Independent Sample t-test was used, while the ANOVA test was applied for comparisons among three or more independent groups. For variables with significant differences among three or more groups, pairwise comparisons were performed using the Tukey test, considering the lack of homogeneity of variances. The Mann-Whitney U test was used for comparisons between two independent groups, and the Kruskal-Wallis H test was applied for comparisons among three or more groups. For pairwise comparisons of variables with significant differences among three or more groups, Bonferroni corrections were applied. In cases where at least one of the two quantitative variables did not conform to a normal distribution, the Spearman correlation coefficient was used.

3. Results

According to Table 1, the average age of the patients was 75.57 ± 13.99 years, with 39 individuals (37.9%) in the 75–84 age group. It was found that 55 patients (53.4%) were female, 99 (96.1%) were married, and 50 (48.5%) were illiterate. Additionally, 59 patients (57.3%) were living with their children, 32 (31.1%) had no comorbidities, and 78 (75.7%) were on multiple medications (Table 1).

Table 1. Distribution of Patients' Socio-Demographic Characteristics

Variable	n	%
Age categories		
<65	22	21.4
65-74	16	15.5
75-84	39	37.9
>=85	26	25.2
Gender		
Female	55	53.4
Male	48	46.6
Marital status		
Married	99	96.1
Single	4	3.9
Education level		
Illiterate	50	48.5
Primary school	31	30.1
Middle school	16	15.5
High school	6	5.9
People living with		
Wife	39	37.9
Children	59	57.3
Siblings	3	2.9
No relatives	2	1.9
Number of comorbid diseases		
No disease	32	31.1
1	30	29.1
2	27	26.2
3	14	13.6
Multiple drug		
Yes	78	75.7
No	25	24.3

According to Table 2, it was determined that 61 patients (59.2%) did not use substances, 56 (54.4%) had dentures as prosthetics, 28 (27.2%) had visual impairments, and 59 (57.3%) had hearing impairments. Additionally, 89 patients (86.4%) were admitted to the ICU through the emergency department. It was found that 56 patients (54.4%) used a central venous catheter (CVC), 98 (95.1%) had a Foley catheter, 34 (33%) used a nasogastric (NG) tube, and 77 (74.8%) had oral intake disorders.

Table 2. Distribution of Patients' Socio-Demographic Characteristics

Variable	n	%
Substance use (Smoking, Alcohol)		
Yes	42	40.8
No	61	59.2
Prosthesis use (Dentures)		
Yes	56	54.4
No	47	45.6
Visual impairment		
Yes	28	27.2
No	75	72.8
Hearing impairment		
Yes	59	57.3
No	44	42.7
ICU admission type		
Emergency	89	86.4
Ward	14	13.6
CVC usage		
Yes	56	54.4
No	47	45.6
Foley catheter usage		
Yes	98	95.1
No	5	4.9
NG Tube Usage		
Yes	34	33.0
No	69	67.0
Oral intake disorder		
Yes	77	74.8
No	26	25.2

ICU: Intensive Care Unit, CVC: Central Venous Catheters,NG: Nasogastric

According to Table 3, a statistically significant difference was found in SMMT scores across age groups (F=4.376; p=0.006). To determine the source of this difference, Tamhane pairwise comparisons were conducted, considering the lack of homogeneity of variances. The results indicated significant differences between individuals in the 65–74 age group and those in the <65, 75–84, and ≥85 age groups. The SMMT scores of individuals aged 65–74 were significantly higher than those of the other groups. A statistically significant difference was also observed in Nu-DESC scores based on education levels (χ^2=12.504; p=0.006). Bonferroni-corrected pairwise comparisons revealed significant differences between individuals with no formal education, those who completed primary or middle school, and those who graduated from high school. High school graduates had significantly higher Nu-DESC scores compared to those with no education or only primary or middle school education. Regarding cohabitation status, SMMT scores showed a statistically significant difference (Z=-2.246; p=0.025). Individuals living with their spouses had significantly higher SMMT scores compared to those living with their children (Table 3).

Table 3. Comparison of Nu-DESC and SMMT Scores

Variable	n	NU-DESC Score		SMMT Score	
		Mean±SD	**Medyan [IQR]**	**Mean±SD**	**Medyan [IQR]**
Age categories					
<65 (1)	22	5.41±2.08	5.0 [5.0]	14.41±4.80	15.0 [10.0]
65-74 (2)	16	4.19±1.60	4.0 [0.8]	18.31±2.44	18.0 [3.5]
75-84 (3)	39	4.97±1.55	5.0 [2.0]	15.38±2.93	15.0 [5.0]
≥85 (4)	26	5.15±1.80	5.0 [3.3]	14.27±4.62	16.0 [7.5]
Statistical analysis		χ^2=4.351 p=0.226		F=4.376 **p=0.006** [2-1,3,4]**	
Gender					
Female	55	5.18±1.76	5.0 [3.0]	14.6±4.30	16.0 [5.0]
Nale	48	4.77±1.75	4.0 [3.0]	15,79±3,59	16.0 [4.8]
Statistical analysis		Z=-1.268 p=0.205		t=-1.051 p=0.296	
Education level					
Illiterate (1)	50	5.22±1.61	5.0 [2.0]	15.02±3.96	15.5 [5.0]
Primary school (2)	31	4.54±1.71	4.0 [3.0]	15.68±4.21	16.0 [6.0]
Middle school (3)	16	4.38±1.92	3.5 [2.8]	17.13±2.55	16.5 [4.8]
High school (4)	6	7.00±1.26	7.5 [2.3]	11.66±4.18	10.0 [6.5]
Statistical analysis		χ^2=12.504 **p=0.006* [1,2,3-4]**		χ^2=7.583 p=0.055	
People he/she lives with					
Wife	39	4.59±1.89	4.0 [3.0]	16.74±3.42	17.0 [4.0]
Children	59	5.11±1.64	5.0 [2.0]	15.01±3.78	16.0 [5.0]
Statistical analysis		Z=-1.784 p=0.075		Z=-2.246 **p=0.025***	
Number of comorbid diseases					
No disease	32	5.00±1.92	5.0 [3.5]	14.91±4.87	15.5 [8.8]
1	30	4.83±1.86	4.0 [3.3]	14.83±3.55	15.5 [3.5]
2	27	4.78±1.58	5.0 [3.0]	16.29±3.71	17.0 [6.0]
3	14	5.71±1.49	6.0 [2.3]	15.64±3.13	15.5 [5.3]
Statistical analysis		χ^2=3.354 p=0.340		χ^2=2.096 p=0.553	
Multiple drug					
Yes	78	4.88±1.71	5.0 [3.0]	15.33±3.96	16.0 [5.0]
No	25	5.32±1.91	5.0 [3.0]	15.40±4.17	15.0 [6.5]
Statistical analysis		Z=-1.081 p=0.280		Z=-0.123 p=0.553	

Nu-DESC; Nursing Delirium Screening Scale, SMMT; Standardized Mini-Mental Test, SD;Standard Deviation; *:p < 0.05; **:p<0.01

According to Table 4, a statistically significant difference was found in Nu-DESC scores based on nasogastric (NG) tube use (Z=-2.316; p=0.021). Patients using NG tubes had significantly higher Nu-DESC scores compared to those not using NG tubes. Similarly, a statistically significant difference was observed in SMMT scores based on NG tube use (Z=-2.695; p=0.007).

Table 4. Comparison of Nu-DESC and SMMT Scores (Continued)

		NU-DESC Score		SMMT Score	
Variable	**n**	**Mean±SD**	**Medyan [IQR]**	**Mean±SD**	**Medyan [IQR]**
Substance use (Cigarettes, Alcohol)					
Yes	42	4.83±1.86	4.0 [3.0]	15.71±3,89	16.0 [6.0]
No	61	5.09±1.70	5.0 [2.0]	15.10±4,07	16.0 [5.0]
Statistical analysis		Z=-0.997 p=0.319		t=0.768 p=0.444	
Prosthesis use					
Yes	56	4.98±1.72	5.0 [2.0]	14.84±3,97	15.5 [6.0]
No	47	5.00±1.82	5.0 [3.0]	15.96±3,97	16.0 [6.0]
Statistical analysis		Z=-0.030 p=0.976		t=-1.423 p=0.158	
Visual impairment					
Yes	28	5.18±1.76	5.0 [3.0]	14.14±3.93	15.0 [6.0]
No	75	4.92±1.77	5.0 [3.0]	15.80±3.94	16.0 [6.0]
Statistical analysis		Z=-0.681 p=0.496		Z=-1.900 p=0.057	
Hearing impairment					
Yes	59	4.93±1.65	5.0 [2.0]	15.19±3.86	16.0 [5.0]
No	44	5.06±1.92	5.0 [4.0]	15.56±4.19	16.0 [5.0]
Statistical analysis		Z=-0.193 p=0.847		Z=-0.823 p=0.411	
ICU Admission					
Emergency	89	5.03±1.79	5.0 [2.0]	15.18±3.85	16.0 [5.0]
Ward	14	4.71±1.54	5.0 [3.0]	16.43±4.79	18.0 [6.8]
Statistical analysis		Z=-0.493 p=0.622		Z=-1.385 p=0.166	
CVC Usage					
Yes	56	5.00±1.89	5.0 [1.0]	15.13±3.89	15.5 [5.0]
No	47	4.98±1.62	5.0 [2.0]	15.62±4.14	16.0 [5.0]
Statistical analysis		Z=-0.034 p=0.973		Z=-0.824 p=0.410	
Foley Catheter Usage					
Yes	98	5.01±1.74	5.0 [2.0]	15.31±4.05	16.0 [5.0]
No	5	4.60±2.30	5.0 [4.0]	16.20±2.59	17.0 [5.0]
Statistical analysis		Z=-0.537 p=0.591		Z=-0.354 p=0.723	
NG Tube Usage					
Yes	34	5.56±1.67	6.0 [3.0]	13.97±3.73	14.0 [5.5]
No	69	4.71±1.75	4.0 [3.0]	16.02±3.96	17.0 [5.0]
Statistical analysis		Z=-2.316 **p=0.021***		Z=-2.695 **p=0.007****	
Oral intake disorder					
Yes	77	5.05±1.79	5.0 [2.5]	14.97±4.00	15.0 [5.0]
No	26	4.80±1.67	5.0 [2.3]	16.46±3.82	17.0 [6.0]
Statistical analysis		Z=-0.497 p=0.619		t=-1.657 p=0.101	

Nu-DESC; Nursing Delirium Screening Scale, SMMT; Standardized Mini-Mental Test, SD;Standard Deviation; *:$p < 0.05$; **:$p<0.01$, ICU; Intensive Care Unit, CVC; Central Venous Catheters**,** NG; Nasogastric

According to Table 5, the mean Nu-DESC score of the patients was 4.99±1.76, while the mean SMMT score was 15.35±3.99. A moderate, statistically significant negative correlation was identified between Nu-DESC and SMMT scores (r=-0.617; p<0.001). This indicates that as SMMT scores increase, Nu-DESC scores decrease, and conversely, as SMMT scores decrease, Nu-DESC scores increase.

Table 5. Analysis of the Relationship Between Patients' Nu-DESC and SMMT Scores

Variable	X	SD	1	2
1. Nu-DESC score	4.99	1.76	1	r: -0.617*****
2. SMMT score	15.35	3.99		1

Nu-DESC; Nursing Delirium Screening Scale, SMMT; Standardized Mini-Mental Test, SD;Standard Deviation, *****p < 0.001

4. Discussion

In our study, the average Nu-DESC score of the patients was 4.99±1.76, and a significant relationship was found between Nu-DESC scores and both education level and NG tube use. When examining the relationship between delirium and education level, it was observed that 48.5% of the patients were illiterate, 30.1% had completed primary school, 15.5% had completed middle school, and 5.9% were high school graduates. A statistically significant difference was identified in Nu-DESC scores based on education levels. High school graduates had significantly higher Nu-DESC scores compared to illiterate patients and those who had completed primary or middle school.

In our study, 94.1% of patients with positive delirium cases had low education levels. This finding suggests that patients with insufficient verbal communication skills may face difficulties in understanding and completing the test, potentially leading to lower Nu-DESC scores.

In a study by Martins et al. investigating the relationship between delirium and education level in elderly patients, a significant association was found between low education levels and delirium [26]. Similarly, Elibol's study revealed that delirium was more prevalent among illiterate patients, and a statistically significant relationship was identified between delirium and low education levels [27]. However, in Guliyev's thesis, no relationship was found between delirium and education level [28].

The literature shows varying results, but the findings of our study are consistent with the majority of existing studies. This supports the conclusion that low education levels are associated with higher rates of delirium.

In patients, especially the elderly, as cognitive functions deteriorate, there is a decline in daily living activities, a worsening of nutritional intake, and an increased need for support. The rate of nutritional deficiencies in elderly individuals ranges from 11% to 44%, but this rate can rise to as high as 60% among hospitalized patients [29]. In our study, 77 patients (74.8%) had oral intake disorders, and 34 patients (33%) required nasogastric tube (NG) feeding due to impaired oral intake. The presence of chest tubes, endotracheal tubes, nasogastric feeding, urinary catheters, arterial monitoring, constipation, and lack of urinary output are precipitating factors for the development of delirium [30].

In our study, a statistically significant difference was found in Nu-DESC scores based on NG tube use. Patients using NG tubes had significantly higher Nu-DESC scores compared to those not using them (p<0.05). The higher Nu-DESC scores in patients with NG tubes are thought to be associated with inappropriate behaviors, such as attempts to remove the tubes.

In a study by Bellelli et al., the presence of nasogastric tubes, central venous catheters (CVC), and urinary catheters was identified as a contributing factor to the development of delirium [31]. Similarly, a study by Al-Hoodar et al. investigating the incidence of delirium and associated factors in ICU patients found a relationship between NG tube use and delirium [32]. The findings of our study

align with the existing literature, confirming the association between NG tube use and higher delirium scores.

In our study, the mean SMMT score of the patients was 15.35±3.99, and a significant relationship was found between SMMT scores and age, cohabitation status, and NG tube use. A statistically significant difference was observed in SMMT scores across age groups. Tamhane pairwise comparisons, accounting for the lack of variance homogeneity, revealed significant differences between the 65–74 age group and the <65, 75–84, and ≥85 age groups. Patients in the 65–74 age group had significantly higher SMMT scores compared to the other age groups.

The findings indicate that individuals aged 65–74 have higher SMMT scores and a lower risk of developing delirium compared to other groups. These results align with those of a meta-analysis by Cao et al., which highlighted a higher risk of postoperative delirium in elderly patients with perioperative cognitive dysfunction [33].

In the study conducted by Çuhadar et al. on elderly individuals living in nursing homes, cognitive impairment was observed, and a significant relationship was found between age and SMMT scores. As age increased, the incidence of cognitive impairment also rose [34]. Similarly, Güngen et al. reported that the average SMMT score was lower in individuals aged 80 and above [25]. However, Hargrave et al., in their study on hospitalized patients, did not find a significant relationship between age and delirium [35].

Although the literature includes studies with varying findings on the relationship between age and delirium, our study aligns with those indicating that patients in the 75–84 and ≥85 age groups have significantly lower SMMT scores. Many other studies in this field support our findings, highlighting the correlation between advancing age and cognitive decline, which increases the risk of delirium.

In our study, a statistically significant difference was found in SMMT scores based on the individuals patients lived with. Patients living with their spouses had significantly higher SMMT scores compared to those living with their children. Van Rompaey et al., in their study on ICU patients, identified that the risk of developing delirium was higher among those living alone [36]. Similarly, a study involving 420 elderly patients residing at home or in nursing homes found that those who were married had higher education levels, and engaged in healthy living behaviors were more likely to live at home [37]. Özen Çınar et al., in their study examining the biological, psychological, and social dimensions of individuals aged 65 and above, found that depressive symptom scores were higher among widowed/divorced elderly individuals compared to those who were married [38]. However, Guliyev's thesis did not find a significant relationship between marital status and delirium [28].

The literature presents varied results; however, in this context, the higher SMMT scores of patients living with their spouses may indicate a better social life, aligning our findings with the literature.

Additionally, a statistically significant difference was found in SMMT scores based on nasogastric (NG) tube use. Patients not using NG tubes had significantly higher SMMT scores compared to those using NG tubes. This suggests that the use of an NG tube increases the risk of developing delirium. A study by Salluh et al., which evaluated the epidemiology of delirium in ICU patients, identified a significant relationship between the presence of urinary catheters, central venous catheters, and delirium [39]. The results of our study are consistent with the existing literature, supporting the association between NG tube use and an increased risk of delirium.

A negative, moderate, and statistically significant relationship was found between Nu-DESC and SMMT scores. An inverse relationship was observed between these scales: as SMMT scores increased, Nu-DESC scores decreased, and vice versa. Higher SMMT scores indicate better cognitive functioning, while higher Nu-DESC scores reflect more severe impairment.

In a descriptive and relational study by Bahar et al., conducted with 55 ICU patients, areas such as disorientation, inappropriate behavior, inappropriate behavior, and communication, illusions were evaluated using Nu-DESC, and it was found that longer hospital stays were associated with worsening conditions in these areas [40]. Similarly, Durmayüksel et al., in a study involving 892 patients, reported that as MMSE (Mini-Mental State Examination) scores increased, the risk of delirium decreased [41].

From this perspective, a comparative analysis of patients' medical and descriptive characteristics using both Nu-DESC and SMMT has not been encountered in the literature. A decrease in SMMT scores signifies worsening cognitive impairment, indicating a poor prognosis. Similarly, an increase in Nu-DESC scores also reflects a poor prognosis.

The relationship between these two scales underscores their importance in identifying delirium and assessing its risks. Although both scales are widely used in separate studies for delirium detection, the statistical relationship observed between them in this study represents a meaningful contribution to the literature. This highlights their complementary value in evaluating cognitive function and delirium risk in clinical settings.

5. Conclusion and Recommendation

The findings of this study indicate that age groups, cohabitation status, and nasogastric (NG) tube use significantly affect SMMT scores, while education level and NG tube use significantly impact Nu-DESC scores. A negative, moderate, and statistically significant relationship was observed between Nu-DESC and SMMT scores. With the use of diagnostic scales such as SMMT and Nu-DESC by nurses, the quality of care can be improved as a result of early identification of risk factors and application of appropriate nursing care to the patient. It is recommended that health professionals working in the ICU should be utilize appropriate assessment scales and trained in the management of patients with delirium and studies with larger samples should be conducted to strengthen the evidence base.

Ethical statement:

Before data collection, written approval was taken from the ethics committee of Health Sciences University Gazi Yaşargil Training and Research Hospital Sciences University Ethics Committee (Decision date and number: 22/07/2022-137) and the institution where the study was conducted.

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Conflict of interest:

The authors declare no conflict of interest.

Authors' Contributions:

Study design: MA, LZA
Data collection and/or analysis: MA
Preparation of the article: MA, LZA
All authors read and approved the final manuscript.

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