Archives of Anesthesiology and Critical Care (Summer 2025); 11(3): 393-401.

Available online at http://aacc.tums.ac.ir

Review Article

Updated Systematic Review and Meta-Analysis Delirium Prevalence in Iranian Hospitals' Patients

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ARTICLE INFO

Article history:
Received 22 August 2024
Revised 12 September 2024
Accepted 26 September 2024

Keywords:
Delirium;
Iran;
Meta-analysis;
Prevalence

ABSTRACT

Background: Delirium is a clinical neuropsychiatric syndrome, the main characteristic of which is a disturbance of consciousness affecting the patient's psychological state, and various factors are effective in causing it. The aim of the study is the prevalence of delirium in Iran.
Methods: This study investigated the prevalence of delirium in a group of patients hospitalized in Iranian hospitals. The search was including PubMed, Scopus, ISI, Science Direct, and Google Scholar search engines in Farsi and English languages. The researchers designed a checklist and then analyzed the extracted results using the CMA software.
Results: This study's initial search yielded 766 articles, of which the initial screening eliminated 458. 98 articles were excluded from the study due to repetition in the search, and finally, 25 articles were included in the analysis stage. According to the findings, the overall delirium prevalence is 22% (CI: 16.8-28.3%), the overall delirium prevalence in heart surgery patients is 20.2% (CI: 12.7-30.6%), and the delirium prevalence in the elderly is 44.3% (CI: 20.7-70.8%).
Conclusion: It is necessary to conduct preventive studies in this field to reduce this amount.

Introduction

Hospitalization of the patient indicated various complications, including infection (respiratory, urinary, and blood), nervous system, digestive, and psychological diseases. One of the important complications after hospitalization of patients is delirium, which is a disordered cognition [1-2]. Delirium is a clinical neuropsychiatric syndrome, the main characteristic of which is a disturbance of consciousness affecting the psychological state of the patient, and various factors are effective in causing it. This disorder's symptoms manifest quickly and may fluctuate throughout the day and night [3-5].

Various factors can cause delirium, and experts have identified underlying and accelerating factors as delirium risk factors. In fact, the underlying factors include the history of cognitive disorders in the patient before hospitalization, the presence of disease complications such as the experience of unrelieved pain, vision disorders, hearing disorders, and the history of concomitant diseases in the hospitalized person (before or during hospitalization). Hospitalization pointed this out. Among the effective and accelerating factors of delirium in patients admitted to the ICU are the use of

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DOI: 10.18502/aacc.v11i3.18504

sedatives, severe sepsis, hypotension, and hypoxemia [6-9].

Delirium occurs during critical illnesses and is a disorder among hospitalized patients, which leads to various complications among patients. Delirium is characterized by fluctuations in cognitive ability and alertness. If the underlying disease related to the cause of delirium is removed, this disorder will improve [10-12].

Delirium may exist in all hospital departments, but its prevalence is higher in intensive care units (ICUs) than in other departments. So that the occurrence of this disease in the ICU is influenced by factors [13]. ICUs are places for admitting patients with acute problems and special conditions, which causes many complications [14].

Delirium may be caused by various diseases such as heart surgery, having an elderly disease, a history of viral diseases such as Covid-19, and overall hospitalization. Indeed, hospitalization in the ICU due to the aforementioned diseases leads to delirium in these patients [15-16]. In order to make an early diagnosis and also to reduce the factors affecting delirium, it is necessary to have the necessary information and statistics on the prevalence of delirium [17-18].

Aim

The meta-analysis study plays a crucial role in the decision-making process of healthcare experts [19-22]. Considering the role of psychological problems and their impact on the health of patients as well as the increasing hospitalization of patients in special wards, for this reason, this study was conducted with the aim of reporting the delirium prevalence in Iran.

Methods

In this study, which was designed based on the registration system for systematic review and based on the PARISMA guidelines [23], the prevalence of delirium in Iranian patients was investigated.

The inclusion criteria for the extracted articles include: 1- Articles published in Farsi and English, 2- The full file containing the published articles must be available, 3- The report of the prevalence of delirium in patients should be mentioned as a percentage.

Exclusion criteria for the extracted articles include: 1- Articles published in congresses, 2- Case reports, interventional, systematic review and meta-analysis articles, and qualitative articles are excluded, 3- Articles with incomplete data.

The search keywords included the keywords "prevalence, delirium, rate, patient, and the country of Iran, which are found in the domestic databases of Iran, such as SID, MagIran, IranMedex, and international databases including PubMed, Scopus, ISI, Science Direct, and the search engine. We searched Google Scholar in both Farsi and English. It should be noted that the search was conducted by two researchers who had complete mastery of scientific topics and searched international databases, systematic reviews of articles, and meta-analyses. If there was a difference between the extracted articles for any reason, the search was done by the third researcher, and a final decision was made. In order to fully extract the desired articles on delirium prevalence in Iranian patients, the references of the extracted articles were studied, and if an article mentioned the delirium prevalence, it was included in the study.

In order to check the methodological quality of the studies, a tool was used that had questions in the field of 5 items of the study design, description of the characteristics of the studied samples, the comparison group, the tools used, and the sample size. The scores of this tool for each item ranged from zero (meaning a lower methodological quality score) to 3 (meaning a higher methodological quality score).

The results of the extracted articles were entered in the checklist designed by the researchers (Table 1), and the extracted results were analyzed in the CMA software.

Table 1- Specifications of the articles

-	Name of the author	place	Years	Department Name	N	%
1	Jannati et al [24]	Mazandaran	2013	Department of cardiac surgery	404	28.5
2	Jodati et al [25]	Tabriz	2013	Department of cardiac surgery	329	4.9
3	Cheragh et al [26]	Tehran	2015	Department of cardiac surgery	40	22.5
4	Eizadi-Mood et al [27]	Isfahan	2014	Department of cardiac surgery	325	44.31
5	Shadvar et al [28]	Tabriz	2013	Department of cardiac surgery	200	23.5
6	Salari et al [29]	Rasht	2017	Department of cardiac surgery	108	38
7	Rad et al [30]	-	2014	Department of cardiac surgery	370	23.24
8	Hassani et al [31]	Urmia	2010	Department of cardiac surgery	514	2.33
9	Ganavati et al [32]	Tehran	2009	Department of cardiac surgery	250	47
10	Ashraflashkari et al [33]	Ahvaz	1999	Department of cardiac surgery	30	10
11	Bagheri et al [34]	Isfahan	2017	Special care	100	34
12	Rezvani et al [35]	Isfahan	2016	Special care	100	46
13	Rajabpour et al [36]	Rasht	2014	Special care	148	27.2
14	Modabernia et al [37]	-	2002	Special care	245	13.4

15	Heidari et al [38]	Isfahan	2014	Special care	270	44.5
16	Darabi et al [39]	Kermanshah	2023	Special care	89	22.3
17	Valizade et al [40]	Urmia	2023	Special care	680	1.8
18	Foroughan et al [41]	Ahvaz	2016	elderly patient	200	22
19	Golparvaran et al [42]	Tehran	2022	elderly patient	300	43
20	Beyraghi et al [43]	Tehran	2014	Psychiatry	201	15
21	Beiranvand et al [44]	Khorramabad	2013	Department of surgery	200	24
22	Jouybari et al [45]	Gorgan	2012	Department of surgery	75	30.6
23	Ashraflashkari et al [33]	Ahvaz	1999	Department of surgery	30	3.3
24	Hosseini et al [46]	Sari	2011	The whole hospital	600	16
25	Hosseini et al [47]	Yazd	2016	The whole hospital	256	14.8
26	Asaee et al [48]	Khorramabad	2008	Normal section	240	25.83
27	Alizadeh Arimi et al [49]	Sari	2023	Special care (covid-19)	50	22
28	Gholi et al [50]	Tehran	2024	Elderly covid-19	310	70
29	Alizadeh Arimi et al [49]	Sari	2023	normal part (covid-19)	259	15.8

Results

This study's initial search yielded 766 articles, of which the initial screening removed 458. 98 articles were excluded from the study due to repetition in the search, and finally, 25 articles were analyzed (Figure 1).

According to the findings, the overall prevalence of delirium is 22% (CI: 16.8-28.3%), the delirium prevalence in heart surgery patients is 20.2% (CI: 12.7-30.6%), and the delirium prevalence in the elderly is 44.3% (CI: 70.8-20.7%) (Figure 2-12).

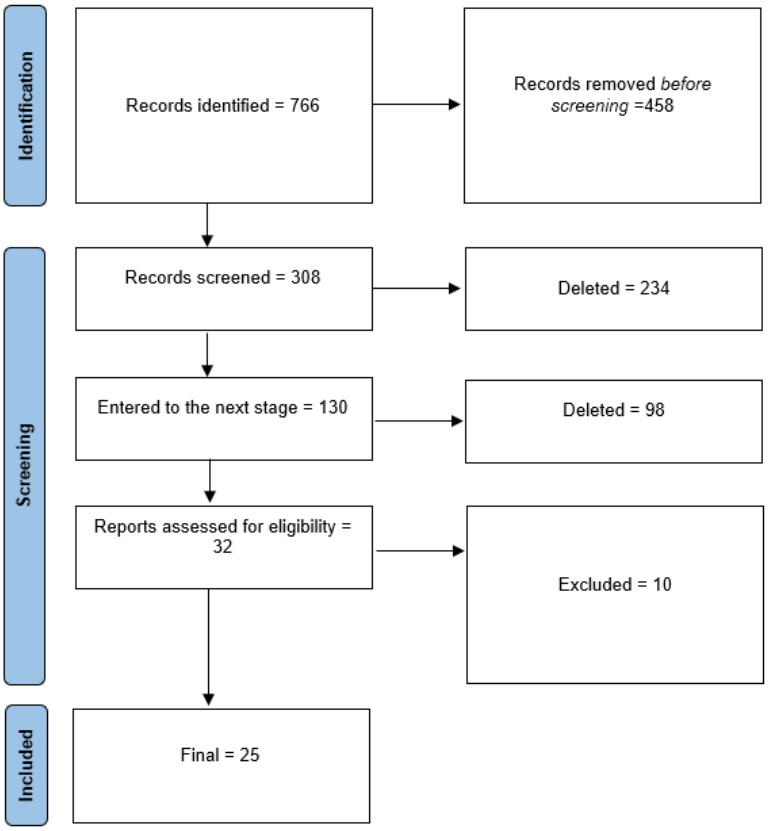

Figure 1- Articles included in the study

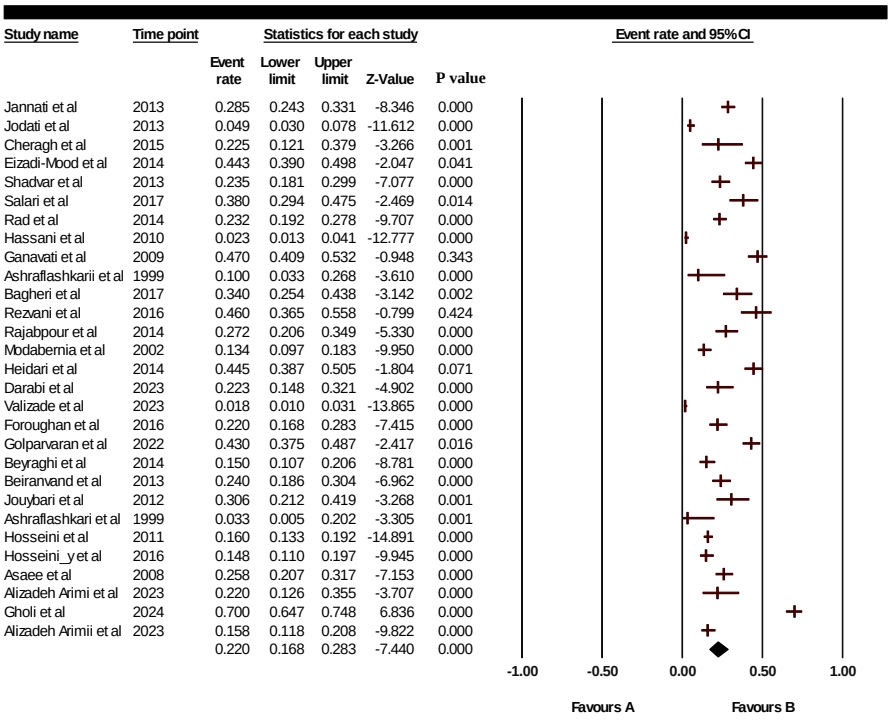

Figure 2- General delirium prevalence in patients admitted to hospitals in Iran

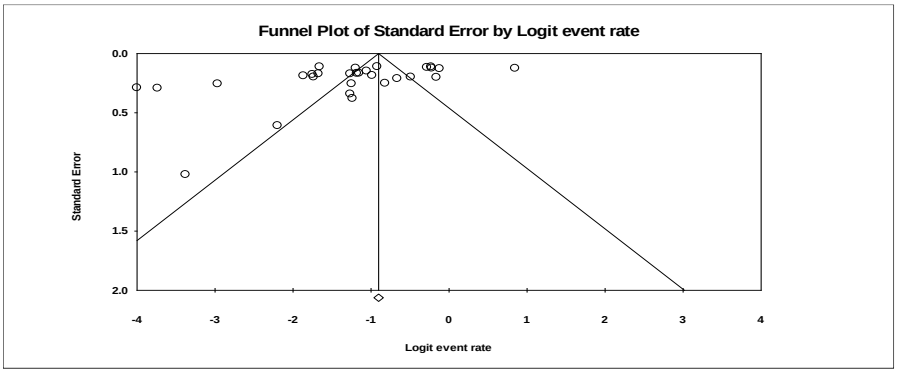

Figure 3- Phenol plot diagram for the delirium prevalence in hospitalized patients in Iranian hospitals

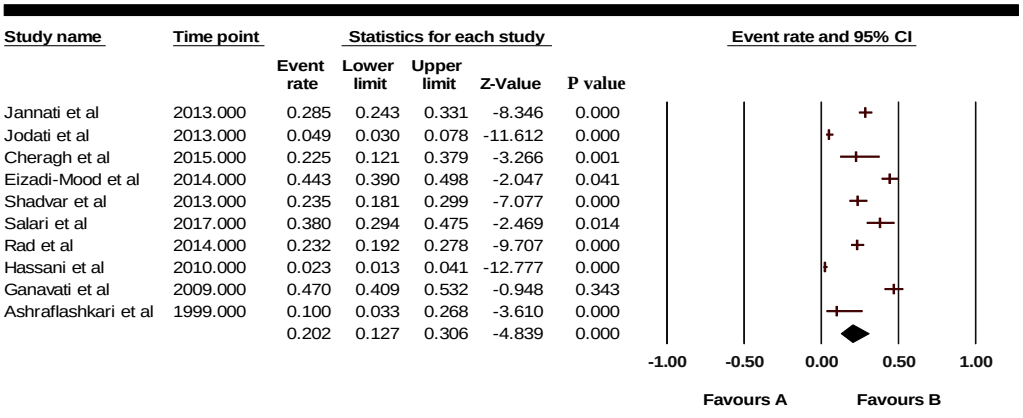

Figure 4- The overall delirium prevalence in patients hospitalized in the cardiac surgery department of Iranian hospitals

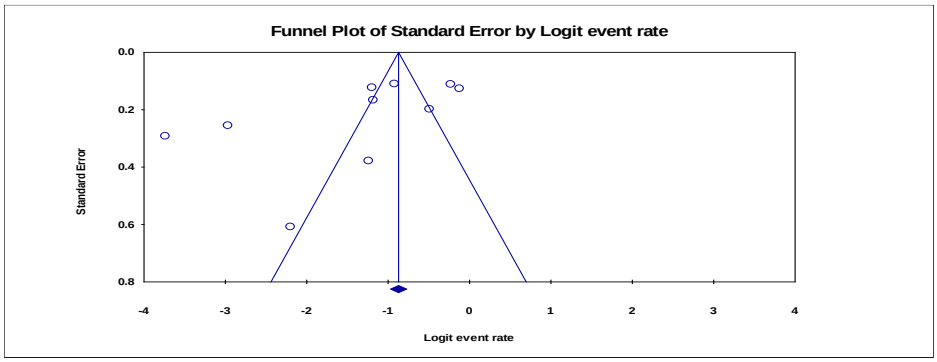

Figure 5- Phenol plot diagram for the delirium prevalence in heart surgery patients hospitalized in Iranian hospitals

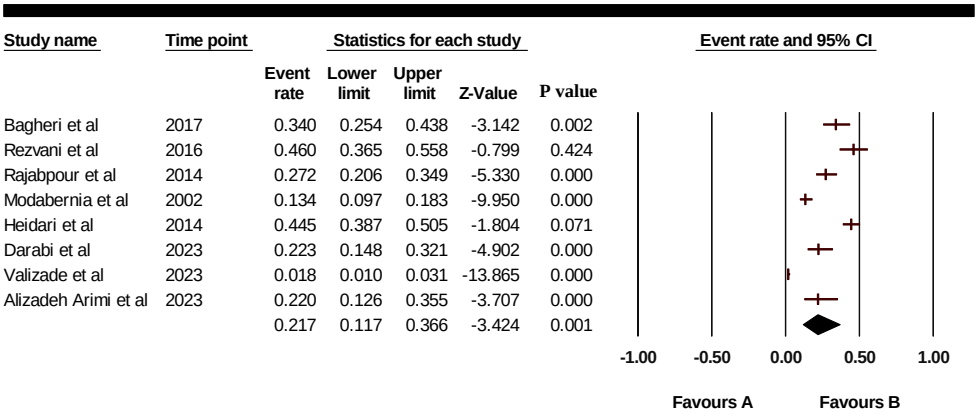

Figure 6- General delirium prevalence in patients hospitalized in the special care department of hospitals in Iran

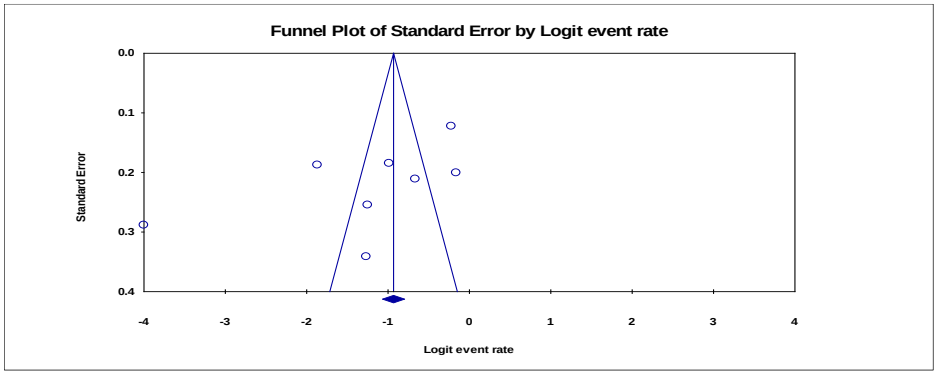

Figure 7- Phenol plot diagram for the delirium prevalence in patients hospitalized in the special care department of hospitals in Iran

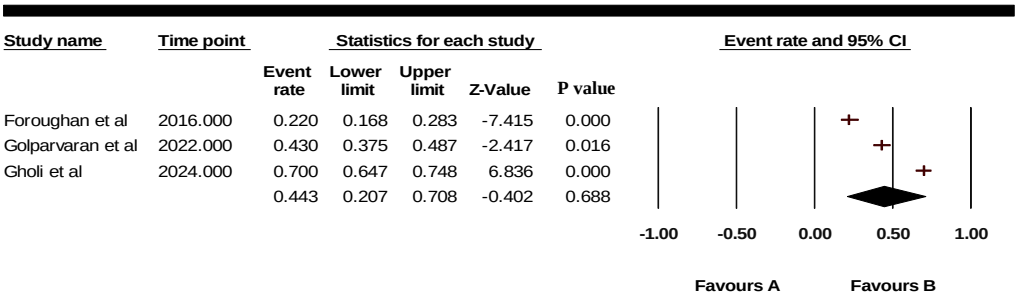

Figure 8- General delirium prevalence in the elderly group admitted to hospitals in Iran

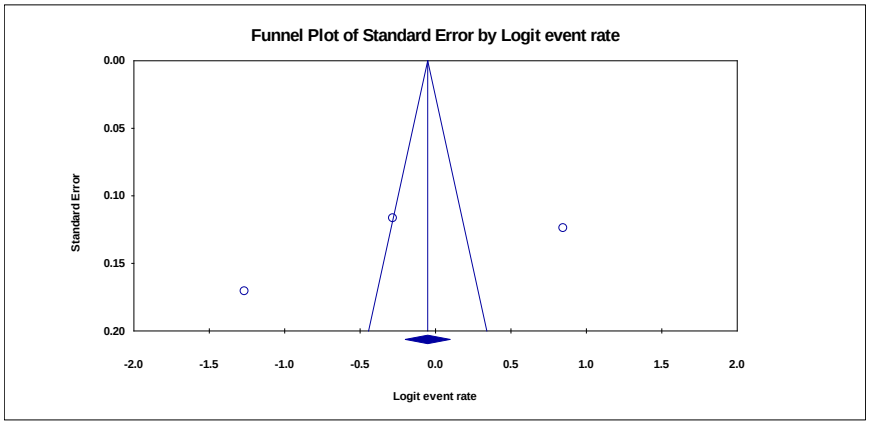

Figure 9- Funnel plot diagram for the delirium prevalence in the elderly admitted to hospitals in Iran

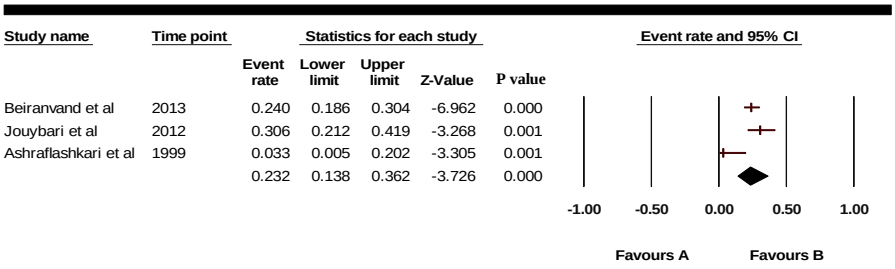

Figure 10- General delirium prevalence in patients hospitalized in the surgical departments of hospitals in Iran

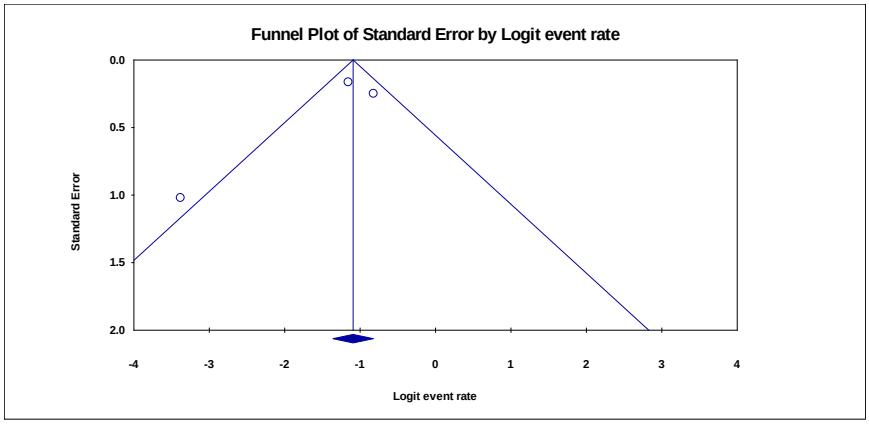

Figure 11- Phenol plot diagram for the delirium prevalence in patients hospitalized in the surgical departments of hospitals in Iran

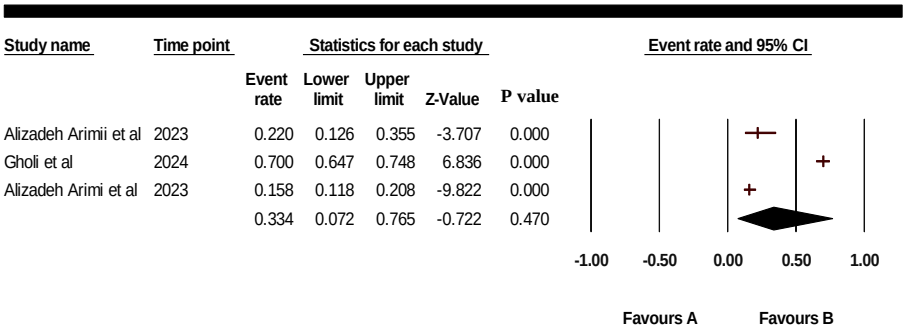

Figure 12- General delirium prevalence in patients with covid-19 hospitalized in Iranian hospitals

Discussion

In Iran, the prevalence of neurological diseases and complications related to neuropsychiatric diseases is high [51-53]. Drug use, trauma, nutritional and electrolyte problems, infections, and changes in or removal of environmental stimuli can all lead to delirium [54–56, 63–64].

Prevalence of delirium in heart surgery patients was 20.2% (CI: 12.7-30.6%). In the study of Bucerius et al. in the group of heart surgery patients, it was shown that the overall delirium prevalence was 8.4%. Also, among the factors affecting the development of delirium, we can mention the history of cerebrovascular diseases, diabetes mellitus, atrial fibrillation, emergency surgery, and cardiogenic shock [57]. In the study conducted by Noh et al. on cardiac surgery patients, delirium was observed in 15% of the 63 patients under examination. Also, among the factors affecting delirium in this study, aortic aneurysm surgery, the patient's length of stay, and laboratory indicators were effective on the delirium prevalence [58]. Also, Jodati et al. studied a group of heart surgery patients and found that 4.9% of them had delirium. Diabetes, peripheral vascular diseases, myocardial infarction, diabetes, and laboratory disorders are some of the things that can cause delirium [25]. The studies mentioned above and this study on delirium in hospitalized heart surgery patients agree.

The result showed that the overall delirium prevalence in the elderly was 44.3% (CI: 20.7-70.8%). In the study by Michel et al., the prevalence of delirium in the elderly was 9.6% (CI: 6.9-12.4%) [59]; in the study by Ryan et al., it was 19.6% in the adult group [60]. In the study by Ryan et al. in the elderly group, the prevalence of delirium was 32%, which was 83.3% in the ICU department and 28.7% in the surgical department [60]. Also, in the study of Grover et al. in the ICU department, out of 152 examined elderly patients, 37 (24.34%) of the patients were diagnosed with delirium, of whom 10 (19.2%) died during hospitalization [61]. In elderly patients, suffering from delirium leads to interference in the identification of other physical and mental disorders of the patient and interferes with the patient's efforts to control the pain and improve the symptoms of the disease [62].

Due to the fact that covid-19 disease is an emerging and new disease, for this reason, among the strong results of this study, we can mention the report of the results of studies related to covid-19 in the results related to the report of data related to delirium.

Conclusions

The prevalence of delirium in Iran is high. For this reason, it is necessary to conduct preventive studies in this field to reduce this amount.

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