

RISK FACTORS ASSOCIATED WITH DELIRIUM IN AGED PEOPLE HOSPITALIZED FOR CLINICAL TREATMENT: AN INTEGRATIVE REVIEW

FATORES DE RISCO ASSOCIADOS AO DELIRIUM EM IDOSOS HOSPITALIZADOS PARA TRATAMENTO CLÍNICO: REVISÃO INTEGRATIVA

FACTORES DE RIESGO ASOCIADOS AL DELIRIO EN ADULTOS MAYORES HOSPITALIZADOS PARA TRATAMIENTO CLÍNICO: REVISIÓN INTEGRADORA

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ABSTRACT

Objective: to identify risk factors associated with development of delirium in aged people hospitalized for clinical treatment. **Method:** an integrative literature review. The search was conducted in February 2022 by applying the search strategy in electronic portals and databases, such as *Biblioteca Virtual em Saúde*, PubMed/MEDLINE and Web of Science. **Results:** the search yielded 965 articles. After removing duplicates, 583 had their titles and abstracts read. After applying the eligibility criteria, 127 studies were submitted to full reading, with exclusion of 110 and analysis of 17, totaling a sample comprised by 6,170 patients. The studies included were those conducted with patients ≥ 60 years of age, clinical treatment, assessment of risk factors for delirium; and the excluded studies were those that used non-validated instruments, case reports, theses, monographs, review articles or that did not answer the research question. The most frequently found risk factors were presence of cognitive deficit and dementia. Other factors also found were as follows: advanced age, presence of fever/infection, dehydration, functional deficit, use of psychotropic drugs before hospitalization, severity of underlying diseases, polypharmacy, visual impairment, pain at rest, presence of diabetes mellitus, frailty and hospitalization time in the emergency sector. **Conclusions:** the studies point to various risk factors associated with delirium and highlight the relevance of the care team recognizing this condition. Fast and effective actions to prevent delirium in aged people depends on its identification. The health team should be alert during the care provided to vulnerable populations so that the screening of signs, which are often fluctuating, is facilitated.

Keywords: Risk Factors; Delirium; Aged; Hospitalization; Nursing Care for Hospitalized Aged People.

RESUMO

Objetivo: identificar fatores de risco associados ao desenvolvimento de delirium em pessoas idosas hospitalizadas para tratamento clínico. **Método:** revisão integrativa da literatura. Busca realizada em fevereiro de 2022 através da aplicação de estratégia de busca em portais e bases de dados eletrônicas, como a *Biblioteca Virtual em Saúde*, o PubMed/MEDLINE e o Web of Science. **Resultados:** a busca resultou em 965 artigos. Após retirada de duplicatas, 583 tiveram títulos e resumos lidos. Respeitados critérios de elegibilidade, chegou-se a 127 estudos para leitura completa, dos quais 110 foram excluídos e 17 analisados, totalizando amostra de 6.170 pacientes. Foram incluídos estudos com pacientes ≥ 60 anos de idade, tratamento clínico, avaliação de fatores de risco para delirium; e excluídos estudos que utilizaram instrumentos não validados, relatos de casos, teses, monografias, artigos de revisão ou que não responderam à questão de pesquisa. Os fatores de risco mais encontrados foram a presença de déficit cognitivo e demência. Outros fatores também encontrados foram: idade avançada, presença de febre/infeção, desidratação, déficit funcional, uso de psicotrópicos antes do internamento, severidade das doenças de base, polifarmácia, déficit visual, dor ao repouso, presença de diabetes mellitus, fragilidade e tempo de internamento na emergência. **Conclusões:** os estudos apontam diversos fatores de risco associados ao delirium e destacam a relevância do reconhecimento do delirium pela equipe assistencial. Ação rápida e eficaz na prevenção do delirium em idosos depende da sua identificação. A equipe de saúde deve estar atenta durante o cuidado de populações vulneráveis para que o rastreio de sinais, muitas vezes flutuantes, seja facilitado.

Palavras-chave: Fatores de Risco; Delírio; Idoso; Hospitalização; Cuidado de Enfermagem ao Idoso Hospitalizado.

RESUMEN

Objetivo: identificar los factores de riesgo asociados al desarrollo de delirium en personas mayores hospitalizadas para tratamiento clínico. **Método:** revisión bibliográfica integradora. Búsqueda realizada en febrero de 2022 aplicando una estrategia de búsqueda en portales y bases de datos electrónicas *Biblioteca Virtual em Saúde*, PubMed/MEDLINE y Web of Science. **Resultados:** la búsqueda dio lugar a 965 artículos. Tras eliminar los duplicados, se leyeron 583 títulos y resúmenes. Se respetaron los criterios de elegibilidad, lo que dio lugar a 127 estudios para su lectura completa, tras lo cual se excluyeron 110 y se analizaron 17, totalizando una muestra de

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6.170 pacientes. Se incluyeron estudios con pacientes ≥ 60 años, tratamiento clínico, evaluación de factores de riesgo de delirio; se excluyeron los estudios que utilizaron instrumentos no validados, informes de casos, tesis, monografías, artículos de revisión o que no respondían a la pregunta de investigación. Los factores de riesgo hallados con mayor frecuencia fueron la presencia de déficit cognitivo y demencia. Otros factores: edad avanzada, presencia de fiebre/infección, deshidratación, déficit funcional, uso de psicofármacos antes de la hospitalización, gravedad de las enfermedades subyacentes, polifarmacia, déficit visual, dolor en reposo, presencia de diabetes mellitus, fragilidad y duración de la estancia en urgencias. **Conclusiones:** los estudios señalan varios factores de riesgo asociados al delirio y destacan la importancia de que el equipo asistencial reconozca la presencia de delirio. Una acción rápida y eficaz para prevenir el delirio en los ancianos depende de su identificación. El equipo sanitario debe estar atento durante la atención a las poblaciones vulnerables para que se facilite el seguimiento de los signos, a menudo fluctuantes.

Palabras clave: Factores de Riesgo; Delirio; Anciano; Hospitalización; Nurses Improving Care for Health System Elders.

INTRODUCTION

Delirium is considered a cognitive disorder and one of the most common syndromes among hospitalized older adults (individuals aged ≥ 60 years old).¹ It has a multifactorial etiology, and these factors interact with each other, being divided into two components: predisposing factors, consisting of factors that impose individual vulnerability on older adults; and precipitating factors, which occur due to external causes.² Identification of these factors in hospitalized older adults and recognition of their vulnerabilities are essential for the prevention of delirium, minimizing its consequences and the increase in morbidity, mortality and institutionalization after hospital discharge, in addition to increased treatment costs.³

The prevalence and incidence of delirium may vary depending on the population studied and the instrument used for its screening and diagnosis.⁴ As it is one of the most common complications in the postoperative period, delirium is more frequently studied in the surgical population.⁵ Patients undergoing clinical care have delirium as a substantial problem; however, its quantification is not simple due to the progressive increase in complexity of the health care faced in recent decades, together with the prioritization of delirium in the clinical practice.⁶

The incidence of delirium in hospitalized older adults can vary from 6% to 56% in General Hospital and from 15% to 53% in the postoperative period; in the Intensive Care Unit, it can reach 80%.⁷ Delirium occurs in all age groups above 60 years old, and may reach twice the frequency in people aged over 80 years old.⁸

The diagnosis of mental conditions, including delirium, were made through oftentimes long and complex indices and manuals, which hindered their use by non-psychiatrists. The development of screening instruments created clearer and more succinct standards that could

be used by other health professionals, not psychiatrists, faster - yet accurately.⁹

The first tool to be validated for screening delirium was published in 1990 by the group led by Dr. Sharon K. Inouye, based on the criteria set forth in the Diagnostic and Statistical Manual of Mental Disorders (DSM-II-I-R).⁹ Entitled Confusion Assessment Method (CAM), it has 94% to 100% sensitivity and 90% to 95% specificity. This instrument aims at equipping clinicians and researchers who are not specialists in Psychiatry with a fast and accurate method for detecting delirium, in addition to enabling the identification of its subtypes (hypoactive, hyperactive and mixed).¹⁰

As stated, delirium is a common and serious condition in the hospitalized geriatric population, and early detection of individuals at risk is crucial for adequate therapy and prevention measures, which include recognition of their risk factors.² Therefore, the current study aimed at identifying risk factors associated with the development of delirium in aged people hospitalized for clinical treatment.

METHOD

Identification of the topic and elaboration of the research question fulfilled the first stage of this integrative literature review, conducted following the six stages of the elaboration process described by Mendes, Silveira and Galvão.¹¹ The research question was prepared from the PECO anagram [P - Population or Patients; E - Exposure; C - Comparator; O - Outcome], where P (Older adults), E (Risk factors), C (Hospitalization) and O (Delirium), which resulted in: **Which risk factors are associated with the development of delirium in aged people hospitalized for clinical treatment?**

The inclusion criteria of the studies were established in the second stage of the review: age ≥ 60 years old; being hospitalized for clinical treatment; aiming at the assessment of risk factors for delirium; studies published from 1990 onwards, as the first validated instrument for delirium screening, the Confusion Assessment Method (CAM), was published in that year;¹⁰ using diagnostic criteria set forth in the Diagnostic and Statistical Manual of Mental Disorders from its third revised edition (in DSM-III, over 30 terms were used to refer to "acute confusional state"). Based on the review of this edition, consensus was reached on the application and definition of the term delirium.¹² The following was established as criterion for exclusion of studies: using non-validated instruments for screening delirium; case reports, theses, monographs and

review articles or feasibility assessment studies; appearing as studies developed in Long-term Institutions for Older Adults (*Instituições de Longa Permanência para Idosos*, ILPIs); and not answering the research question.

Also in the second stage, a search strategy was elaborated, having as matrix the terms from the Medical Subject Headings (MeSH) controlled vocabulary from the PubMed portal (used for the PubMed and Web of Science databases) and translated for the vocabulary of the *Biblioteca Virtual em Saúde* (BVS) database: *Descritores em Ciências da Saúde* (DeCS). The descriptors were

chosen from terms divided into four blocks: the first block deals with “Older adults”; the second with “Hospitalization”; the third with “Risk factors”; and the fourth with “Delirium”. Another two blocks were added, excluding Delirium tremens⁽¹³⁾ and patients hospitalized in the Intensive Care Unit (ICU) for presenting specific pathophysiology and external risks,¹⁴ resulting in the search strategies presented in Figure 1.

The search was carried out independently in February 2022 by two researchers and through application of the search strategy in the electronic BVS and

Figure 1 - Search strategies in specific databases, Curitiba, Paraná, Brazil, 2022

Database	Search strategy
PubMed	((Aged OR Aged, 80 and over[MeSH Terms]) AND (Hospitalization[MeSH Terms]) AND (Risk Factors[MeSH Terms]) AND (Delirium[MeSH Terms]) NOT (Alcohol Withdrawal Delirium[MeSH Terms]) NOT (Intensive Care Units[MeSH Terms]))
Web of Science	((Aged OR Aged, 80 and over) AND (Hospitalization) AND (Risk Factors) AND (Delirium) NOT (Alcohol Withdrawal Delirium) NOT (Intensive Care Units))
BVS	(Idoso OR Idoso de 80 Anos ou mais OR Aged OR Aged, 80 and over) AND (Hospitalização OR Hospitalization) AND (Fatores de Risco OR Risk Factors) AND (Delírio OR Delirium) AND NOT (Delirium por Abstinência Alcoólica OR Alcohol Withdrawal Delirium OR Delirium Tremens) AND NOT (Unidades de Terapia Intensiva OR Intensive Care Units)

Source: The authors.

PubMed/MEDLINE databases and in the restricted Web of Science database on the CAPES Journals Portal. In order to reduce the possibility of errors in the search and evaluation of the eligibility or not of the studies, a third researcher was consulted in cases of doubts.

In the third stage, the articles were read in full in order to categorize them and extract the data to a spreadsheet structured by the authors themselves in Microsoft Excel®, version 16.53. The extracted data were the following: author(s) and year of publication; journal; title; objective; study design; country where the study was carried out; sample/number of participants; instrument used to assess delirium; incidence/prevalence of delirium; risk factors found; age for inclusion of participants; and main results.

In the fourth stage, a critical reading of the articles was carried out in order to synthesize the available information, in addition to the level of evidence classification proposed by Melnyk and Fineout-Overholt¹⁵ and consisting of seven levels, described as follows: 1) Systematic review or meta-analysis, with randomized controlled clinical trials and/or clinical guidelines based on systematic reviews of randomized controlled clinical trials; 2) Randomized controlled clinical trial; 3) Clinical trials without randomization; 4) Cohort and case-control studies; 5) Systematic review of descriptive and qualitative studies; 6) Descriptive or qualitative study; and 7) Opinion of

authorities and/or report of experts' committees (Figure 3).¹⁵ In the fifth stage, the results were interpreted and a discussion based on the research question was carried out. In the sixth stage, a synthesis of the articles analyzed was performed and the final considerations were indicated.

RESULTS

All 965 articles were introduced into the MENDELEY® bibliographic manager and 382 duplicates were removed. A total of 583 titles and abstracts were read respecting the inclusion and exclusion criteria, which resulted in 127 studies for full reading. Once the article had been read in full, 110 were excluded from the sample and 17 were selected for review and analysis. The flowchart indicated in the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) was used to illustrate the selection process corresponding to the articles that comprised the integrative review *corpus* (Figure 2).

The publications presented homogeneous distribution across 1990,¹² 1993,¹⁶ 2000,¹⁷ 2005,¹⁸ 2006,¹⁹ 2010,²⁰ 2011,²¹ 2015,²² 2016²³ and 2020²⁴ (n=1; 5.88%). There was a discreet increase in the number of publications in 2014^{7,25,26} (n= 3; 17.64%), 2018^{27,28} and 2021^{8,29} (n=2; 11.76%). There was predominance of the English language in the publications^{7,8,12,16,18,29} (n=16; 94.12%), and one of the articles was published in Spanish¹⁷ (5.88%).

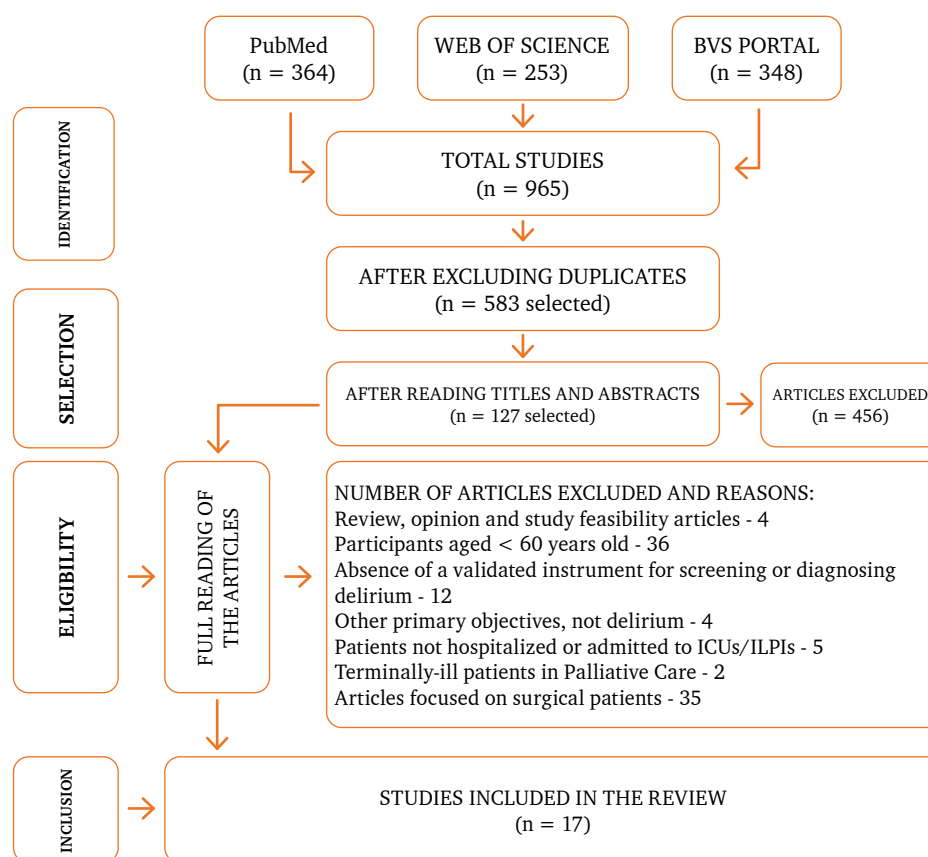


Figure 2 - Flowchart of the selection process corresponding to the studies, adapted from PRISMA. Curitiba, PR, Brazil, 2022
Source: The authors.

In relation to the methodological design, prospective cohort^{7,8,12,16-18,21-25,27} (n=12; 70.59%) and cross-sectional^{19,26,28,29} (n=4; 23.53%) studies prevailed, followed by case-control studies²⁰ (n=1; 5.88%). The size of the samples varied from 126 people in a prospective cohort study conducted in the Netherlands¹⁸ to 3,076 aged individuals in a prospective cohort study conducted in Switzerland.⁸

Figure 3 shows the categorization of the articles by author, year of publication; sample size; country of origin; study design; age for inclusion of participants; objectives; instruments used for screening/diagnosis of delirium; and level of evidence. Figure 4 presents the incidence, prevalence and risk factors for delirium found by study with patients hospitalized for clinical treatment.

Among the studies analyzed, the most cited risk factors for delirium were related to cognition, such as presence of cognitive deficit (n=7; 41.17%),^{7,12,16,18,20,23,30} and dementia (n=6; 35.30%).^{8,19,21,24,25,27}

Other factors found were advanced age,^{23,25,27} presence of fever/infection,^{12,17-19,21,27} dehydration,^{12,16,18} functional deficit,^{18,19,27} use of psychotropic drugs before

hospitalization,^{12,19} severity of the disease that led to hospitalization,^{12,14,17,21} polypharmacy,²⁵ visual deficit,¹⁶ pain at rest,²⁹ presence of diabetes⁷ and frailty.^{19,30}

The hospitalization time in the emergency sector was pointed out as a risk factor for the development of delirium in aged people. Patients who stayed more than 10 hours in the emergency sector before being transferred to the room developed more delirium.²³ Hospitalization in a collective room led to higher incidence of delirium in the older adults when compared to hospitalization in a single room.²⁴ In this study, the authors questioned possible biases in the results: to what extent would the environment (and not only the individualized accommodation) be responsible for the decrease in the incidence of delirium?, as one unit had old facilities and collective rooms and the other unit with single rooms was newly built.

One of the studies initiates the discussion about risk factors for delirium in aged people hospitalized with COVID-19 diagnoses. In this study, it was shown that cognitive impairment (OR: 3.7; CI 95%: 1.7-7.9, p=0.001) and frailty (OR: 1.3; CI 95%: 1.1-1.7; p=0.004) increase the

Figure 3 - Categorization of the studies that comprised the integrative review. Curitiba, PR, Brazil, 2022

Author/Year of publication	Sample size	Country of origin	Study design	Age for inclusion	Primary objective(s)	Diagnosis/ Screening of Delirium (Instruments)	Level of Evidence
FRANCIS; MARTIN; KAPOOR, 1990 ¹²	229	USA	Prospective cohort study	≥70	To determine the etiology, risk factors and common manifestations of delirium in hospitalized clinical patients and to examine immediate outcomes and at 6 months	DSM-III-R diagnostic criteria	4
INOUE et al., 1993 ¹⁶	281	USA	Prospective cohort study	≥ 65	To determine the risk factors for delirium in hospitalized aged people	CAM	4
VÁZQUEZ et al., 2000 ¹⁷	149	Argentina	Prospective cohort study	≥ 65	To determine the risk factors and incidence of delirium in hospitalized aged people	CAM	4
KOREVAAR; MUNSTER; ROOIJ, 2005 ¹⁸	126	Netherlands	Prospective cohort study	≥ 65	To determine the risk factors for delirium in aged people hospitalized in emergency sectors	CAM	4
MARGIOTTA et al., 2006 ¹⁹	330	Italy	Cross-sectional study	≥ 65	To assess the clinical characteristics and risk factors for the development of delirium in hospitalized aged people with clinical pathologies, according to presence or absence of dementia	CAM; DRS	6
FRANCO et al., 2010 ²⁰	291	Colombia	Case-control	≥ 60	To assess how cognitive decline severity modifies the delirium incidence risk and if there is a linear relationship between cognitive status and severity of delirium	CAM + DRS-R-98	4
SRINONPRASERT et al., 2011 ²¹	225	Thailand	Prospective cohort study	≥70	To determine the risk factors for delirium in aged people hospitalized in Medical Clinic wards	DSM IV	4
HEIN et al., 2014 ²⁵	410	France	Prospective cohort study	≥ 65	To examine associations between delirium and polypharmacy in aged people during hospitalization	CAM	4
FORTINI et al., 2014 ⁷	560	Italy	Prospective cohort study	≥ 65	To identify factors that predispose to developing delirium in aged people hospitalized in clinical wards	CAM	4

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Figure 3 - Categorization of the studies that comprised the integrative review. Curitiba, PR, Brazil, 2022

Author/Year of publication	Sample size	Country of origin	Study design	Age for inclusion	Primary objective(s)	Diagnosis/ Screening of Delirium (Instruments)	Level of Evidence
RITCHIE et al., 2014 ²⁶	710	England	Cross-sectional study	≥ 70	To describe the association between C-Reactive Protein levels and the incidence and severity of delirium in a sample of hospitalized aged people	CAM	6
AVILA-FUNES et al., 2015	141	Mexico	Prospective cohort study	≥ 70	To investigate the estradiol serum levels and delirium in hospitalized aged women	CAM-DSM-4	4
BO et al., 2016 ²³	330	Italy	Prospective cohort study	≥ 75	To determine whether hospitalization time in the emergency sector prior to admission is associated with a higher incidence of delirium	Rapid assessment for delirium (4AT scale)	4
GUAL et al., 2018 ²⁷	909	Spain	Prospective cohort study	≥ 65	To investigate the risk factors for delirium and its outcomes in aged people with or without dementia hospitalized after intensification of chronic conditions	CAM	4
FEAST et al., 2018 ²⁸	230	England	Cross-sectional study	≥ 70	To investigate the relationship between pain and delirium in people with dementia at admission and during hospitalization	CAM	6
BLANDFORT et al., 2020 ⁴	1,014	Denmark	Prospective cohort study	≥ 75	To investigate the risk of delirium among patients in shared rooms when compared to those in individual ones	CAM	4
MENDES et al., 2021 ⁹	235	Switzerland	Cross-sectional study	≥ 65	To investigate the prevalence and risk factors of delirium in aged people hospitalized due to COVID-19 and to associate hospitalization time and mortality	CAM and DSM 5	6
MARQUETAND et al., 2021 ⁸	3,076	Switzerland	Prospective cohort study	≥ 80	Objectives: (1) To estimate the prevalence of delirium in the longer-lived older adults, (2) To investigate risk factors previously related to this population group, and (3) To identify predisposing and precipitating factors for delirium for care planning purposes	DOSS; ICDSC and DSM 5	4

Key: DSM - Diagnostic and Statistics Manual of Mental Disorders (versions 3R, 4 and 5); CAM - Confusion Assessment Method; DRS - Delirium Rating Scale; DOSS - Delirium Observational Screening Scale; ICDSC - Intensive Care Delirium Screening Checklist.

Figure 4 - Categorization of the studies according to incidence, prevalence and risk factors of delirium in patients hospitalized for clinical treatment. Curitiba, PR, Brazil, 2022

AUTHOR, DATE	INCIDENCE	PREVALENCE	RISK FACTOR FOUND
Francis; Martin; Kapoor, 1990 ¹²	The more risk factors, the higher the incidence. 1 factor = 10% 2 factors = 30% 3 factors = 60% > 4 factors, close to 100%	Not evaluated	Normal sodium levels - (OR: 6.2; 95% CI: 2.2-17.8) Severity of the disease - (OR: 5.9; 95% CI: 1.8-9.3) Previous cognitive deficit - (OR: 5.3; 95% CI: 1.8-15.4) Fever or hyperthermia (Infection) - (OR: 5.0; 95% CI: 1.8-13.7) Use of psychoactive drugs - (OR: 3.9; 95% CI: 1.4-10.8) Azotemia - (OR: 2.9; 95% CI: 1.3-6.7)
Inouye et al., 1993 ¹⁶	25% and 17%	Not evaluated	Visual deficit - (RR: 3.51; 95% CI: 1.15-10.71) Presence of a severe disease (RR: 3.49; 95% CI: 1.48-8.23) Cognitive deficit - (RR: 2.82; 95% CI: 1.19-6.65) Elevated BUN (dehydration) - (RR: 2.02; 95% CI: 0.89-4.6)
Vázquez et al., 2000 ¹⁷	20.50%	Not evaluated	Severity of the disease - (RR: 1.28; 95% CI: 1.14-1.43) Presence of a chronic disease (RR: 3.45; 95% CI: 2.4-4.96) Fever at admission (RR: 1.84; 95% CI: 1.33-2.56)
Korevaar, Munster, Rooij, 2005 ¹⁸	Not evaluated	28%	Cognitive deficit - (HR: 9.48; CI 95%: 2.27-39.54; p<0.01) Functional deficit - (KATZ ADL between 5 and 6, HR: 8.14; 95% CI: 1.08-61.31; p=0.04); > 7 HR: 14.13; 95% CI: 2.26-88.24; p<0.01) Uremia - (HR: 1.10; 95% CI: 1.02-1.18; p<0.01) Leukocytosis - (HR: 0.87; 95% CI: 0.79-0.97; p=0.01)
Margiotta et al., 2006 ¹⁹	Not evaluated	19.1%	In patients with dementia: Patients with delirium present greater functional deficits (Barthel Index at admission < 50, 80.8% and 44.4%, p<0.02) Malnutrition - (albumin < 3.0 mg/dl in 53.9% and 22.2% with and without delirium, respectively, p<0.05) Use of psychotropic drugs at admission (76.9% and 44.4%; p<0.03) Infection (fever, leukocytosis, urinary or respiratory infection with and without delirium, respectively, in 7% and 16.7%, p<0.01)
Franco et al., 2010 ²⁰	11.70%	Not evaluated	Cognitive deficit - Delirium group MMSE 24.23 (SD = 4.01), significantly higher than in the group without delirium 20.65 (SD = 4.65)
Srinonprasert et al., 2011 ²¹	48.90%	40.40%	Pre-existing dementia - (OR: 5.52; 95% CI: 2.51-12.14) Presence of a severe disease (OR: 5.18; 95% CI: 2.10-12.76) Presence of infection (OR: 2.54; 95% CI: 1.15-5.61) Azotemia - (OR: 2.55; 95% CI: 1.20-5.40)
Hein et al., 2014 ²⁵	25%	Not evaluated	Age - (OR: 2.15; 95% CI: 0.15-3.99) Dementia - (OR: 3.6; 95% CI: 1.74-5.72) Polypharmacy - (OR: 2.33; 95% CI: 1.23-4.41)
Fortini et al., 2014 ²⁷	8%	Not evaluated	Cognition (SPMSQ score) - (OR: 1.18; 95% CI: 1.08-1.29, p=0.0002) Male gender - (OR: 1.18; 95% CI: 1.119-4.240; p=0.0220) Type 2 Diabetes - (OR: 1.93; 95% CI: 1.006-3.723; p=0.0478) Chronic Renal Failure - (OR: 2.07; 95% CI: 1.026-4.210; p=0.0424)
Ritchie et al., 2014 ²⁶	12.30%	Not evaluated	High CRP - (OR: 1.32; 95% CI: 1.10-1.58; p=0.003)
Avila-Funes et al., 2015 ²²	16.3%	Not evaluated	Increased estradiol levels at hospital admission among aged women (OR: 1.93; 95% CI: 1.28-2.92)
Bo et al., 2016 ²³	15.80%	Not evaluated	Hospitalization time in the emergency sector for more than 10 hours - (OR: 2.23; 95% CI: 1.13-4.41) Moderate to severe cognitive decline - (OR: 5.47; 95% CI: 2.76-10.85) Age - (OR: 1.07; 95% CI: 1.01-1.13)
Gual et al., 2018 ²⁷	38.7%	Not evaluated	Age - (HR: 1.1; 95% CI: 1.02-1.08; p<0.001) Dementia - (HR: 5.2; 95% CI: 3.5-7.7; p<0.001) Functional status - (HR: 0.093; 95% CI: 0.986-0.999; p=0.020) Urinary tract infection - (HR: 1.9; 95% CI: 1.1-3.1; p=0.017)
Feast et al., 2018 ²⁸	15%	Not evaluated	Pain at rest - (OR: 3.26; 95% CI: 1.03-10.25; p=0.044) There was no significant association between delirium and pain while moving

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Figure 4 - Categorization of the studies according to incidence, prevalence and risk factors of delirium in patients hospitalized for clinical treatment. Curitiba, PR, Brazil, 2022

AUTHOR, DATE	INCIDENCE	PREVALENCE	RISK FACTOR FOUND
Blandfort et al., 2020 ²⁴	29% incidence in patients admitted to shared rooms vs. 16% in those admitted to individual ones	Not evaluated	Presence of delirium is lower in aged people hospitalized in a single room - (HR: 0.66; 95% CI: 0.48-0.93) Dementia - (HR: 1.74, 95% CI: 1.02-2.98; p=0.04)
Mendes et al., 2021 ²⁹	Not evaluated	20.4%, as follows: 41.6% hypoactive; 35.4% hyperactive; 23.0% mixed	Patients with cognitive impairment are approximately 4 times more likely to develop delirium when compared to those with normal cognition before SARS-CoV-2 infection - (OR: 3.7; 95% CI: 1.7-7.9; p=0.001) Each increase in the frailty scale increases the risk of delirium by 35% (OR: 1.3; 95% CI: 1.1-1.7; p=0.004), while better functioning appears to be protective against delirium for each additional point on the FIM scale - (OR: 0.9; 95% CI: 0.97-0.99; p=0.029)
Marquetand et al., 2021 ⁸	41.8%	Not evaluated	Dementia - (OR: 15.6; 95% CI: 10.17-23.91, p<0.001) Hypertension - (OR: 4.61; 95% CI: 2.74-7.76, p<0.001) Epilepsy - (OR: 3.65; 95% CI: 2.12-6.28, p<0.0001) Acute renal failure - (OR: 4.96; 95% CI: 2.38-10.3, p<0.001) Intracranial hemorrhage - (OR: 8.7; 95% CI: 4.27-17.7; p<0.001) Pleural effusion - (OR: 3.25; 95% CI: 1.77-17.8; p<0.001)

Key: OR - Odds Ratio; CI - Confidence Interval; RR - Relative Risk; BUN - Blood Urea Nitrogen; HR - Hazard Ratio; KATZ ADL - Katz Index of Independence in Activities of Daily Living; MMSE - Mini-Mental State Examination; SD - Standard deviation; SPMSQ - Short Portable Mental Status Questionnaire; CRP - C-Reactive Protein; FIM - Functional Independence Measure.

risk of developing delirium.²⁹ Improved functioning levels appear to be protective against the development of delirium, with each additional point on the FIM (Functional Independence Measure [range 0 to 126]) scale reducing by 2% the risk of delirium (OR: 0.9; 95% CI: 0.97-0.99; p=0.029)⁽³⁰⁾.

DISCUSSION

Delirium is considered the most frequent psychiatric syndrome during hospitalization,³⁰ especially in the aged population.³¹ In this review, the incidence of delirium varied from 8%⁷ to 41.80%⁸ in clinical patients. Although frequent, the diagnosis of delirium remains undetected or persists in the territory of suspicion³². In a classic prospective study carried out in the USA, it was shown that the care team recognized delirium only in 19.3% of the observations, when compared to 30.5% of diagnoses by trained researchers. The main factors for failure in recognition found were presence of hypoactive delirium (OR: 7.4; 95% CI: 4.2-12.9); age over 80 years old (OR: 2.8; 95% CI: 1.7-4.7); visual impairment (OR: 2.2; 95% CI: 1.2-4.0); and dementia (OR: 2.1; 95% CI: 1.2-3.7).³³

In the same sense, a study carried out in the USA in 2016 used data on the incidence of delirium from the Massachusetts All-Payers Claims Database with a literature review of studies that formally assessed delirium

to establish an expected rate. After crossing the data, a discrepancy was noted between the incidence of delirium recorded in the database (2.8% in patients aged ≥ 65 years old and 1.2% in those ≤ 65 years of age) and the one expected by the literature (mean of 23.6%). For the authors, this low incidence found in the database is related to failure in the diagnosis of delirium, to failure in data coding or to lower incidence in community hospitals.³⁴

Diagnosis of delirium and identification of the risk factors associated with hospitalized aged people are relevant to avoid further complications in this population group already weakened by the disease condition, often associated with sarcopenia, physical frailty, malnutrition and hospitalization itself,³⁵ with a need to focus on its prevention.³⁶

Some risk factors are common and frequent in aged patients. As already shown, cognitive deficit and dementia were found in several studies included in this review, which makes cognitive screening important, both for assessing the risk of developing delirium and for designing prevention and treatment strategies for this pathology. It is important to address modifiable factors such as anemia, physical frailty, control of chronic diseases and malnutrition, which could be managed more effectively in older adults, reducing the delirium incidence risk.

Age proves to be a significant factor in the development of delirium, and its prevalence in people over 80 years old (41%) can double when compared to the prevalence in the general population, which is approximately 20%.⁸

In addition to the risk factors already listed, a number of studies have shown the presence of severe outcomes in patients affected by delirium: higher in-hospital mortality (OR: 24.88; 95% CI: 13.75-45.03; $p < 0.001$)⁸ and mortality at 30 days (HR: 2.10; 95% CI: 1.20-3.70; $p = 0.0113$).³⁰ An increase in the hospitalization time ($9.87 \pm 3.48 \times 6.95 \pm 2.45$ days; $p < 0.05$)¹⁷ was also evidenced, as well as ($p = 0.002$)⁷ and institutionalization after hospital discharge (18% \times 7%; $p < 0.01$)⁷ and (OR: 2.20; CI 95%: 1.73-2.80; $p < 0.001$).⁸

Nursing plays a fundamental role in identifying both delirium and the risk factors presented by aged people during hospitalization. Close contact with the patients is a facilitator to identify those at a higher risk of developing delirium. After early identification of these patients, the health team can implement measures to maintain orientation, mobility and cognition, in addition to ensuring sleep hygiene, nutrition and pain management optimization⁽³⁷⁾.

The effectiveness of the multicomponent Nursing intervention in the management of patients at risk of developing delirium was demonstrated in a quasi-experimental study developed in Colombia. The interventions consisted in adapting the environment, cognitive stimulation through spatial and time guidance and visual and auditory stimulation, in addition to encouraging family support. The incidence of delirium in the control group was 20.10% and 33.10% per 1,000 persons/day (95% CI: 22.70-48.30) and, in the intervention group, it was 0.60% and 0.64% per 1,000 people/day (95% CI: 0.22-11.09)⁽³⁸⁾.

This review highlights the importance of Nursing actions both in the diagnosis and in the identification of risk factors for delirium in the hospitalized aged population, as well as the need for technical-scientific productions aimed at the Brazilian population, which lacks studies in this area.

As limitations of this integrative review, we can highlight the variety of instruments for assessing delirium, the dichotomous assessment modality and the fact that severity was not assessed. There was no language restriction in the search for publications, which can be considered a strong point, in addition to the methodological rigor employed.

CONCLUSION

This review highlights several risk factors associated with the development of delirium, such as cognitive impairment, dementia, advanced age, presence of infection, malnutrition and functional capacity, in addition to highlighting the relevance of its recognition by the care team. Identification of these risk factors shows an aged population that is more vulnerable to delirium and raises the possibility of recognizing potential therapeutic targets in its prevention.

The studies analyzed show the severity and consequences of delirium, as well as the need to implement screening and predictive models for rapid and effective actions in the prevention of delirium in aged people, especially for the Brazilian population, which still lacks specific studies.

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