METHODS AND TOOLS TO IDENTIFY ADVERSE EVENTS IN LONG-TERM CARE PATIENTS. A SYSTEMATIC REVIEW

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Introduction: The prevalence of adverse events (AEs) has been studied by epidemiological studies in different settings (hospital care, primary care, emergency department). Less is known about long-term care patients. Also, a general overview of the magnitude of the problem is lacking in this care level.

Objective: This review aims to describe tools and alarm signals used to characterize the epidemiology of adverse events in long-term care.

Methods: We have developed an exhaustive systematic search using a PICO table strategy. We have searched the PubMed database for articles published from 2000 to 2021. Two reviewers independently extracted data and assessed the methodological quality of the included papers using the Rayyan web tool.

The primary outcomes of this review were tools used to characterize adverse events in long term care quantitatively.

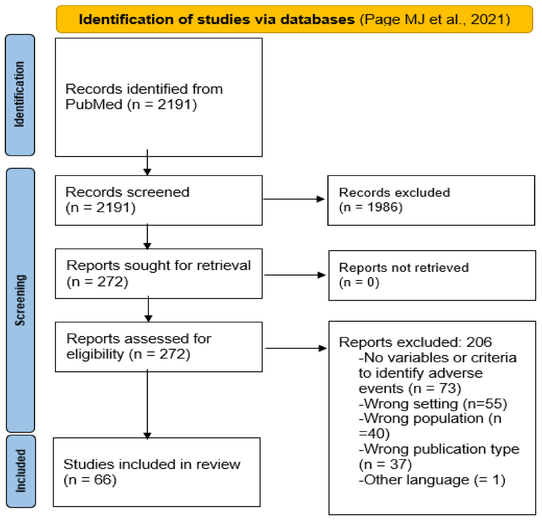
The secondary outcomes are the incidence and warning signal of adverse events in these settings.

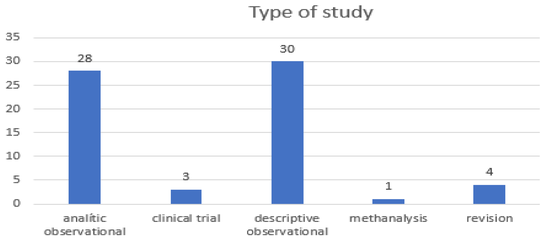
To be considered eligible for this review, studies had to be carried out in intermediate care, long term care, nursing home or convalescent care populations, conducted in people over 65 years old or mixed populations where more than 80% of the population had to be >65 years old. We excluded study protocols, editorials, narratives, guidelines or consensus studies, summary articles, commentaries, articles with no abstract and articles performed in other languages than English or Spanish.

Two reviewers independently reviewed full papers for final selection.

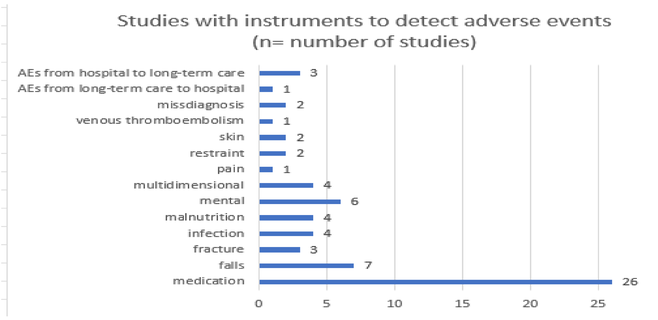
We considered adverse events as any type of harm, unintended injury or complication resulting in the use of extra resources, prolonged hospital stay, disability at the time of discharge or death and caused by healthcare management rather than by the patient's underlying disease process.

This review has been presented as a protocol in PROSPERO.





RESULTS:



AE	WARNING SIGNS
Adverse drug event (ADE)	• clinician describing a medication which could cause a potential ADE • any unplanned hospitalization • emergency department evaluation: ECG blood analysis, INR, falls
Falls	• First week of admission to long term care • Previous falls • confusion • older than 65 years • sensory deficit • inability to walk independently • urge incontinence • cardiovascular/respiratory disease affecting perfusion and oxygenation • medications that affect blood pressure or level of consciousness • postural hypotension with dizziness • connection to equipment (such as IV poles, oxygen, tubes, etc.).
Fracture	•risk factors for osteoporosis •history of falls •dietary calcium and protein intakes •osteoporosis •sarcopenia
Infection	•positive urine culture •acute functional decline •fever rigors, radiography, blood culture •new hypotension
Malnutrition	•BMI <= 22 • Unintentional weight loss > 5% in the last 3 or > 10% in the last 6 months, calculated from weight history from routine documentation. • nursing staff reported low intake, if food intake was voluntary markedly low during the last week • MNA <17
Mental (delirium)	1.acute onset and fluctuation of symptoms over the course of the day 2.inattention 3.disorganized thinking 4.altered level of consciousness 5.disorientation 6.memory impairment 7.perceptual disturbances 8.psychomotor agitation or retardation 9.altered sleep–wake cycle. The presence of criteria 1 and 2 plus the presence of either criterion 3 or 4 is indicative of a definite delirium
Multidimensional	• falls • worsening activities of daily living • lack of energy • derivation to hospital • death • pressure ulcer • malnutrition • falls • hypotension
Pain	• unbearable pain • pain when changing position • pain when walking • pain when standing • constant pain • pain when stair climbing • pain when sitting
Restraint	• Use chemical or physical restraint
Skin	• Lack of sensory perception • skin exposure to moisture • little or no activity level • immobility • poor nutritional status • high level of friction and shear • incontinence
Venous thrombo-embolism (VTE)	•VTE signs/symptoms and treated by anticoagulants
AEs from long-term care to hospital	•Derivation to emergencies
AEs from hospital to long-term care	•urinary catheter carrier at admission

ECG: electrocardiogram; INR:International Normalized Ratio; IV: intravenous; BMI: body mass index; MNA:Mini Nutritional Assessment; PU: pressure ulcer; LTC: long-term care

MEDICATION	•From 2 to 11 adverse drug events (ADE) per 100 residents per month
FALLS	•incidence of falls ranges from 5-27%.
FRACTURE	•Level of risk of hip fracture in one year was 0.5 and 19.2% • The probability of fracture at ten years evaluated with the FRAX tool was 27% and 15% for major fracture and hip fracture, respectively
INFECTION	•Antibiotic resistance was detected in 162/299 (54%) patients. •50% of catheterized residents who participated in the study had clinically diagnosed catheter-associated urinary tract infections
MALNUTRITION	•Malnutrition ranges from 10.5%-18%.
MENTAL HEALTH	•The most frequent mental AE was delirium with 34%
MULTIDIMENSIONAL	•The studies that we have found of multidimensional instruments are frailty tools, predictors of adverse events such as falls, mortality or worsening of activities of daily living), or the scale of dependence to identify pressure ulcers, falls or malnutrition. We have also found an instrument that uses a dimension of the geriatric depression scale, specifically based on lack of energy and relates it to the risk of having adverse events and referral to a hospital
PAIN	•Pain-prevalence was 68.0%
RESTRAINT	•The use of physical or chemical restraint increased from 57.9% to 75.7% in 11 years
SKIN	•The prevalence of PU is between 3 and 30% •96% had at least 1 skin problem with incontinence dermatitis
VENOUS THROMBOEMBOLISM	•The incidence of venous thrombosis among LTC was nearly 30 times higher than the published incidence rates for the home population
MISSDIAGNOSIS	•Results found for a specific diagnosis.
AES FROM LONG-TERM CARE TO HOSPITAL	•The annual incidence of derivation from LTC to hospital was 0.62 admissions per person-year (respiratory diseases, related to falls and circulatory diseases, which accounted for 55% of cases)
AES FROM HOSPITAL TO LONG-TERM CARE	• 32% of hospital admissions for hip fracture had urinary catheters. • Prolonged indwelling urinary catheterization was associated with a 58% higher chance of UTI rehospitalization, a 22% higher odds of sepsis re-hospitalization, a 7% lower odds of home discharge at 30 days, and a 31% higher chance of mortality at 30 days.

CONCLUSIONS:

We did not identify a global adverse event assessment tool for people admitted to convalescent, intermediate care and long-term care centers. Being a difficult area to look for, because it is less developed.

This systematic review provides scientific information describing different tools to identify and characterize the occurrence of adverse events in long-term care in older people. We also found the main warning signs for detecting AEs and carrying out improvement strategies to prevent them.

References:

Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, & et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ, 372(71).