Prevalence of Malnutrition in Eastern Mediterranean Hospitals: Protocol of a Systematic Review and Meta-Analysis

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Abstract

Background: Malnutrition has negative consequences in hospitals, like poor disease recovery, increased mortality, length of hospitalization, readmission, and health care costs.

Aims: This review was designed to determine malnutrition prevalence in hospitals located in eastern Mediterranean region (EMR).

Study design: To conduct this systematic review, papers, including original articles, related references and conference proceedings on the prevalence of malnutrition in adult hospitalized patients published in international journals and scientific databases from 1 Jan 2017 to 31 Jan 2022 will be included. The following keywords and their alternatives will be used in the literature search: malnutrition, patient, and EMR. The protocol has been registered at PROSPERO (code: CRD42022339426).

Methods: After initial screening based on inclusion and exclusion criteria, the full text articles will be read carefully and eligible documents will be selected according to the defined objectives. Afterward, the selected papers will be reviewed for methodological quality and the required information will be extracted. Finally, in case of sufficient data, a meta-analysis will be performed. Screening, selection, quality assessment, and data extraction will be done by at least two independent reviewers.

Results: This review is ongoing and will be completed until the end of year 2023.

Conclusion: This review aims to provide comprehensive evidence about the prevalence of malnutrition among adult inpatients in EMR hospitals. This can provide regional authorities, health managers and policy makers good information regarding current status to make appropriate decisions for promoting the health status in hospitals.

Keywords: eastern Mediterranean; EMR; hospital; malnutrition; prevalence; systematic review

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Background

Malnutrition denotes any deviation from optimal nutrition and is highly prevalent in hospitals. A multicenter Canadian study published in 2016 reported that 45% of medical and surgical patients who stayed in hospital for more than two days had some degrees of malnutrition on admission based on subjective global assessment (SGA) [(1)]. Persian Nutritional Survey In Hospitals (PNSI), a multi-center survey in Iranian hospitals, found that roughly a quarter of patients were malnourished (SGA-B & C) [(2)]. Also, findings of NutritionDay in the US hospitals indicated that 32.7% of patients were malnourished or at nutritional risk (malnutrition screening tool (MST) score ≥2)[(3)].

Malnourished patients have worse clinical outcomes and poor disease recovery [(4, 5)]. Malnutrition increases the risk of clinical complications and related healthcare expenses. For example, a study estimated the associated additional cost of malnutrition to be €5,829 per patient [(6)]. Previously, some systematic reviews were published about hospital malnutrition in different world regions. A systematic literature review on hospital malnutrition in northeast and southeast Asian countries included 92 English articles from 1997 to 2018 with 62,280 subjects and reported the prevalence of >40%. In that study, malnutrition was associated with elevated clinical complications, mortality, length of hospitalization, hospital readmissions, and healthcare costs [(7)]. In a systematic literature review in Latin American countries between 1995 to 2014, 66 eligible studies with 29 ,474 patients were found and the prevalence of disease-related malnutrition was between 40 to 60% [(8)]. Another study reviewed the existing documents on hospital-acquired malnutrition amongst adult inpatients between April and June 2020 and fifteen articles were included with 10%–65% of patients experienced worsened nutritional status. Frequently described barriers were mealtime disruptions, meal displeasure, procedure-related fasting, effects of illness or treatment, chewing problems, poor appetite and low clinical priority of malnutrition [(9)]. According to the abovementioned issues, it seems that the risk of malnutrition in hospitalized patients is a major challenge to the health care systems around the world and needs immediate attention. The findings of previous reviews alert the need for routine nutritional risk screening throughout hospital admission and stay duration. We found no related systematic review in eastern Mediterranean region (EMR) hospitals, therefore this review will provide good information regarding current status of malnutrition in the region for policy makers and health authorities to manage malnutrition and to plan for prevention of its unfavorable consequences.

Objectives

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The primary objective of this investigation is to assess the prevalence of malnutrition among adult inpatients in hospitals located in EMR. The secondary objectives are to evaluate the prevalence of malnutrition among hospitalized people in EMR according to disease, gender, age group, assessment tools, study design, severity of malnutrition, and regional setting, and to evaluate studies' heterogeneity and its potential determinants.

Methods

In this protocol, the reported items are based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol checklist [(10)].

Eligibility Criteria

In this systematic review, we will include all studies that reported the prevalence of malnutrition in EMR hospitals or provided main data to calculate it. We will use POLIS criteria (Population, Outcome, Location, Indicator, Study) for study inclusion as follows:

Participants/Population

We will include studies conducted in hospitalized patients of both genders, ≥18 years old, with sample size of at least 30 patients. We will not restrict the study to a specific race or ethnicity.

Outcome

Studies measuring malnutrition subjectively and/or objectively will be included in our review, e.g. valid questionnaires (SGA, mini-nutritional assessment [MNA], etc.), related biomarkers (like serum albumin concentration), or anthropometric measures (like body mass index [BMI]).

Location

We will include studies conducted in hospitals located in EMR region, including Afghanistan, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Pakistan, Qatar, Saudi, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen.

Indicator

We will include studies that measured or reported prevalence rate (%) of malnutrition in the studied population or the required data to calculate it.

Types of Studies

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Studies with observational design, including cohorts, case-control or cross-sectional studies, and baseline data of interventional studies will be included.

Exclusion criteria

Studies in other populations, e.g. outpatients, children, pregnant or lactating women, etc., or locations other than hospital, will be excluded. Protocol studies, case-reports or case series, books, and abstracts or no full-text documents will not be considered for further analysis.

Search Strategy

A comprehensive search will be performed in PubMed, Web of Science, Google Scholar and Scopus databases to obtain published articles from 1 Jan 2017 to 31 Jan 2022 without language restriction. Relevant grey literature (reference lists of included studies and related conferences) will also be searched. Key terms related to "Malnutrition, Hospital, and Eastern Mediterranean Region" will be found using MeSH entry and free-text method (by scanning the similar literature or systematic reviews and speaking to an expert in the field) and then, we will create a proper syntax for PubMed and will modify it for other databases.

Data Management and Study Selection

To store and organize the search results, they will be imported into a reference manager (EndNoteTM X7, Thomson Reuters). All the included documents will be reviewed for inclusion criteria and irrelevant studies will be excluded. We will then delete repeated documents and two reviewers (RA and HM) will evaluate the titles and abstracts of potential studies for inclusion and exclusion criteria, followed by full-text screening. Any disagreement will be solved by discussion and afterwards by consulting an expert reviewer (BN or TN). Articles that do not meet the inclusion criteria will be excluded by reasons. A flow diagram will illustrate all the steps according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline [(11)]. Researchers will contact the corresponding author twice during a period of 7 to 14 days if they are unable to access the full text of the articles or if they have questions about the information [(12)]. In the absence of outcome data, we will use other available data in the article to calculate the outcome [(13)]. If no data will be achieved, we will explore only the available data and report the missing data. Finally, additional eligible articles retrieved from other sources will be pooled to the included documents.

Data Extraction

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Data extraction will be done by two independent reviewers (RA and HM) in an Excel sheet from the included documents. The extraction form will include data on bibliographic (such as first author, title, year, etc.), study (such as country, design, setting, year, sample size, sampling method, data collection, period, participants, and main outcomes), indicator (prevalence rate), and assessment method. Any disagreement will be resolved by discussing and after that by consulting with an expert person (BN).

Risk of Bias Assessment

Two independent reviewers (RA and HM) will assess risk of bias (or quality) of selected papers that meet the inclusion criteria. Studies reporting prevalence data will be assessed for bias availability using the "Joanna Briggs Institute (JBI) Critical Appraisal Checklist" [(14)]. This tool has been developed by the JBI and collaborators and approved by the JBI Scientific Committee and designed for use in systematic reviews. It evaluates the methodological quality of a study and determines the extent to which a study has addressed the possible bias in its design, conduct and analysis. JBI checklist includes 9 questions regarding sample frame, participants' recruitment, sample size, description of subjects and setting, data analysis, condition identification methods, condition measurement, statistical analysis, and response rate, with three possible answers: yes, no, unclear/not applicable. In case of disagreement, the strategy of discussion and thereafter, consulting with an expert reviewer (BN) will be applied.

Data Synthesis

The key outcome of this review is malnutrition prevalence. In case of sufficient data, we will calculate the pooled estimate of malnutrition prevalence and 95% confidence intervals (CIs). Forest plot will visualize the heterogeneity of the pooled data and inter-studies heterogeneity will be assessed using forest plot, I-squared (I^2) test, and Cochran Q test [(15, 16)]. $I^2 \geq 50\%$ will be considered as a severe heterogeneity and the significance level will be assumed <0.05. When severe heterogeneity is evident, subgroup analysis considering age, gender, disease, setting, design, country, malnutrition tool and severity, study quality, economic level of country and other possible factors will be executed to identify the potential sources of heterogeneity. We will choose fixed or random effects model to perform meta-analysis based on the level of methodological heterogeneity.

Reporting Bias and Sensitivity Analysis

A funnel plot will be used to visualize publication bias and Begg's or Egger's test will be used to measure it statistically [(17)], using appropriate statistics software. P value <0.05 will be considered high possibility of publication bias.

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The sensitivity analysis will be conducted, if needed, to determine how robust the selection and inclusion processes are [18]. The effect of missing studies on results will be estimated using "trim & fill method" and the number of studies added to funnel plot will be reported [19]. Sensitivity analysis will determine the impact of study's quality, design, sample size, and analysis methods by one by one study removal method and calculation of pooled results without each study.

Results

The protocol has been registered in the International Prospective Register of Systematic Reviews (PROSPERO) (code: CRD42022339426). We will report findings of this systematic review based on PRISMA guideline. The systematic process will be illustrated through PRISMA flow diagram in the final article.

Discussion

Well-designed systematic reviews and meta-analyses can appropriately depict the current knowledge from studies and reduce gaps between evidence and practice by combining studies and synthesizing their findings [18]. This paper presents a protocol to conduct a systematic review and potentially a meta-analysis to assess malnutrition prevalence in EMR hospitals. The results will provide a useful evidence to health authorities and policymakers to make reasonable planning and practice towards prevention of malnutrition and promotion of nutrition status in the hospital setting.

Biographies

Razieh Anari is a Ph.D. candidate in Nutrition Research at department of Nutrition Research at NNFTRI. She is interested in doing research on obesity, diabetes and nutritional assessment of susceptible people using quantitative and qualitative methods.

Bahareh Nikooyeh is associate Professor of Nutrition and head of department of Nutrition Research at NNFTRI. She did Ph.D. in Nutrition at SBMU. Her research interests are nutrition epidemiology and nutritional interventions.

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