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The Effect of Preoperative Education in Elderly Patients on Postoperative Outcomes: A Systematic Review and Meta-Analysis

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INTRODUCTION

Review question / Objective P: Older patients undergoing surgery. I: Preoperative education. C: Standard care. O: Postoperative pain, intensive care unit admission, postoperative complication. Does the preoperative education given to elderly patients have an effect on surgical results?

Condition being studied Life expectancy of people in the world is increasing. Elderly individuals constitute 9.8% of the world population (United Nation, 2022). The world population aged 60 and over is expected to reach 22% by 2050 (WHO, 2022). With the increase in life expectancy, chronic diseases develop in individuals. According to the National Council on Aging (NCOA) data, approximately 95% of individuals aged 60 years and over have at least one chronic disease, while 80% have at least two chronic diseases (NCOA, 2023). Accordingly, the number of surgeries performed on elderly individuals is increasing (Baquero, 2015; Becher, 2022). Age-related decreased physiological reserve and anxiety may impair myocardial perfusion and trigger inflammatory responses. At the same time, undesirable health behaviors such as physical inactivity/restriction or non-compliance with treatment may also occur with aging. These conditions may delay surgical recovery, increase pain levels, complication rates and ICU admissions in elderly patients (Baquero, 2015;Ahmed, 2018; Xu, 2020; Ruiz, 2021; Güneş;2021; Peng,2022; Shen, 2022; Ho, 2022; Wang, 2023).

Preoperative education is described as a process that aims to help the patient understand and mentally prepare for the surgical procedure and recovery process. Preoperative education and preparation of patients have positive benefits for postoperative and discharge processes (Ljung, 2020; Peng, 2022; Shen, 2022; Ho, 2022; Wang, 2023). Studies have investigated the effectiveness of preoperative education for adult patients (Choi, 2018; Movahedi, 2018; Suffian, 2020; Shan, 2020), as well as meta-analysis studies (Kim, 2021; Ng, 2022).

In meta-analysis studies involving adult patients undergoing surgery, preoperative educational interventions were found to be effective in reducing patients' postoperative pain levels and the rate of postoperative complications (Kim, 2021; Ng, 2022). However, there is currently no systematic review or meta-analysis study on the effectiveness of preoperative education in elderly patients undergoing surgery.

The aim of this study was to examine the effect of preoperative education provided to elderly patients undergoing surgery on postoperative outcomes, including pain, postoperative complications rate, and admission rate to the intensive care unit (ICU).

METHODS

Search strategy The search strategy was designed using PICO (patient or population, intervention, control or comparator, and outcomes) search terms to identify relevant studies. We searched Ovid PubMed-Medline, Cochrane Library, Scopus, ScienceDirect and Web of Science electronic databases. Original research studies published between 1980 and 2023 were included if they provided preoperative education to patients aged 60 years and older undergoing surgery. A combination of search terms including 'patient education,' 'preoperative education,' 'elderly,' 'geriatric patients,' 'surgery,' and 'elective surgical procedures' was used.

Participant or population Individuals aged 60 and over who will undergo any surgery.

Intervention Preoperative education given to elderly patients.

Comparator Standart care.

Study designs to be included Randomized controlled trials Randomized.

Eligibility criteria Inclusion Criteria:

• Patients aged 60 years and older

• Randomized controlled trials (RCTs) conducted during the preoperative period

• Elderly individuals who have undergone any type of surgery

• Assessment of the effect of preoperative education on early postoperative outcomes (e.g., pain, presence of complications, admission to the intensive care unit, etc.)

Information sources The studies to be included in the study were determined by scanning electronic databases and in line with the inclusion criteria. Randomized controlled studies were included.

Main outcome(s) In the pooled analysis for the presence of pain on the 1st day after surgery, a total of 743 patients were assigned, 377 of whom were assigned to the experimental group and 366 to the control group. In the absence of significant heterogeneity (Chi2 = 1.59, I2 = 37%, p = 0.21), pain occurrence in the intervention group was associated with a significantly lower risk than in the control group (OR = 0.58, 95% CI: 0.41-0.81, p = 0.002). ICU admission rates were also conducted by including a total of 812 individuals from two independent studies. In the meta-analysis conducted using the random effects model, no significant differences in ICU admission were observed between the intervention and control groups (OR = 0.64, 95% CI: 0.19-2.09, p = 0.46). Although the number of studies was small, a high level of heterogeneity was determined (Chi2 = 7.81, I2 = 87%, p = 0.005). For postoperative complications, reports from a total of three independent studies were pooled. In the analysis, which included a total of 912 patients, no significant differences were detected between the groups (OR = 0.46, 95% CI: 0.17-1.27, p = 0.13). A high level of heterogeneity was determined among groups (Chi2 = 8.15, I2 = 75%, p = 0.02).

Quality assessment / Risk of bias analysis Zotero was used to collate and de-duplicate search results from the databases. Reviewer-1 screened abstracts and title of the studies for compliance with the inclusion criteria. The full texts and references of the articles were then assessed by two independent researchers. The agreement reached 98% when the articles independently selected by the two researchers were considered.

“The Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument” (JBI-MAStARI) checklists were used to determine the methodological quality of the included articles and to identify potential biases in study design, implementation, and analysis. The "Checklist for Randomized Controlled Trials" checklist, consisting of 13 items, was used to assess the quality of RCT included in our study. During the evaluation phase, a score of "yes" was assigned one point, while "no," "unclear," and "not applicable" were scored as 0. Studies with a score ≥ 7 were included in our study (Nakhcivan, 2017). The included studies scored between 7 and 11 points. The scores obtained using the JBI-MAStARI assessment tool are given in Table 1.

A consensus rate of 80% and above between researchers is interpreted as good consensus (Kansızoglu, 2019). In our study, the consensus rate of scores obtained by two independent researchers using JBI-MAStARI was 100%. As a result of the evaluation of the studies, three studies were excluded from the meta-analysis due to insufficient data to calculate statistical tests. However, these three studies were used to interpret and discuss the meta-analysis results.

Strategy of data synthesis Data analysis and visualization for the meta-analysis were performed using Review Manager (RevMan) version 5.4, developed by the "Nordic Cochrane Centre" in Denmark (Rewman, 2024). Mantel-Haenszel was adopted as the statistical method of analysis. The findings of the meta-analysis are presented with 95% confidence intervals, employing the odds ratios (ORs) as the measure of effect. Heterogeneity across the outcomes of the meta-analyses was evaluated using the chi-square (χ2) test, setting the significance threshold at $p < 0.05$, alongside the I2 statistics to quantify inconsistency (Higgings, 2008). The choice of statistical methods for pooled analyses in this study hinged on the observed heterogeneity level among the included studies. In all executed meta-analyses, a two-tailed p-value of less than 0.05 was established to measure statistical significance. Random effects models were applied in cases of significant heterogeneity, whereas fixed effects models were adopted when heterogeneity was not significant.

Subgroup analysis Data analysis and visualization for the meta-analysis were performed using Review Manager (RevMan) version 5.4, developed by the "Nordic Cochrane Centre" in Denmark (Rewman, 2024). Mantel-Haenszel was adopted as the statistical method of analysis. The findings of the meta-analysis are presented with 95% confidence intervals, employing the odds ratios (ORs) as the measure of effect. Heterogeneity across the outcomes of the meta-analyses was evaluated using the chi-square (χ2) test, setting the significance threshold at $p < 0.05$, alongside the I2 statistics to quantify inconsistency (Higgings, 2008). The choice of statistical methods for pooled analyses in this study hinged on the observed heterogeneity level among the included studies. In all executed meta-analyses, a two-tailed p-value of less than 0.05 was established to measure statistical significance. Random effects models were applied in cases of significant heterogeneity, whereas fixed effects models were adopted when heterogeneity was not significant.

Sensitivity analysis Data analysis and visualization for the meta-analysis were performed using Review Manager (RevMan) version 5.4, developed by the "Nordic Cochrane Centre" in Denmark (Rewman, 2024). Mantel-Haenszel was adopted as the statistical method of analysis. The findings of the meta-analysis are presented with 95% confidence intervals, employing the odds ratios (ORs) as the measure of effect. Heterogeneity across the outcomes of the meta-analyses was evaluated using the chi-square (χ2) test, setting the significance threshold at $p < 0.05$, alongside the I2 statistics to quantify inconsistency (Higgings, 2008). The choice of statistical methods for pooled analyses in this study hinged on the observed heterogeneity level among the included studies. In all executed meta-analyses, a two-tailed p-value of less than 0.05 was established to measure statistical significance. Random effects models were applied in cases of significant heterogeneity, whereas fixed effects models were adopted when heterogeneity was not significant.

Country(ies) involved Turkey.

Keywords elderly; preoperative; education.

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