


Exploring the Efficacy of Olive Oil in Preventing Pressure Ulcers: A Systematic Review

Maria Victoria Isabella[1], Lorettha Wijaya[2], Rennie Yolanda[1], Daniel Ardian Soeselo[3], William[4], Alius Cahyadi[5]

[1]School of Medicine and Health Sciences, [2]Department of Dermatology and Venereology, [3]Department of Surgery, [4]Department of Medical Biology, [5]Department of Internal Medicine, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia

ABSTRACT

Introduction: Pressure ulcers frequently occur in bedridden patients as a result of immobility and friction, causing delays in recovery and leading to complications. Natural skin care, including olive oil, have shown promising results in preventing ulcers. This paper aims to assess the efficacy of olive oil in reducing the risk factors associated with pressure ulcers and preventing their occurrence in bedridden patients. **Methods:** A systematic review using PRISMA guidelines, examining studies from 2012 to 2025. All studies measuring the effect of olive oil in preventing pressure ulcers in bedridden patients and calculating the risk using the Braden Scale Score were included. The RoB 2 and ROBINS-I quality assessment tools assessed the risk of bias. **Results:** Ten studies with a low risk of bias, comprising 662 participants, were included. Nine studies showed a preventive effect of pressure ulcers, while one study showed that pressure ulcers were still developing despite olive oil application. **Conclusion:** Olive oil is beneficial in reducing pressure ulcer risk factors and preventing pressure ulcers in bedridden patients.

Keywords: Bedridden patient, olive oil, pressure ulcer, prevention.

ABSTRAK

Pendahuluan: Ulkus dekubitus, yang umum terjadi pada pasien tirah baring karena imobilitas dan gesekan, mengganggu pemulihan dan menyebabkan komplikasi. Perawatan kulit alami antara lain dengan minyak zaitun berpotensi mencegah ulkus dekubitus. Penulisan artikel ini bertujuan untuk menilai efektivitas minyak zaitun dalam mengurangi faktor risiko ulkus dekubitus dan mencegah terjadinya ulkus dekubitus pada pasien tirah baring. **Metode:** Tinjauan sistematis terhadap studi dari tahun 2012 hingga 2025 menggunakan pedoman PRISMA. Semua studi yang mengukur efektivitas minyak zaitun dalam mencegah ulkus dekubitus pasien tirah baring serta mengalkulasi risiko menggunakan skor Skala Braden menjadi kriteria inklusi. Risiko *bias* dinilai menggunakan alat penilaian kualitas RoB 2 dan ROBINS-I. **Hasil:** Sepuluh studi dengan total 662 partisipan dan risiko *bias* rendah ditinjau dalam studi ini. Sembilan studi menunjukkan adanya efek pencegahan ulkus dekubitus, satu studi menunjukkan bahwa ulkus dekubitus masih terjadi meskipun telah menggunakan minyak zaitun. **Simpulan:** Minyak zaitun bermanfaat mengurangi faktor risiko ulkus dekubitus dan mencegah ulkus dekubitus pada pasien yang terbaring di tempat tidur. **Maria Victoria Isabella, Lorettha Wijaya, Rennie Yolanda, Daniel Ardian Soeselo, William, Alius Cahyadi. Eksplorasi Efektivitas Minyak Zaitun untuk Mencegah Ulkus Dekubitus: Tinjauan Sistematik.**

Kata Kunci: Pasien tirah baring, minyak zaitun, ulkus dekubitus, pencegahan.

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INTRODUCTION

Pressure ulcers are a common medical complication in bedridden patients and constitute a significant problem for healthcare centers in various countries, particularly in Indonesia.[1] In the United States, the incidence of pressure ulcers in patients ranges from 2.7% to 29.0%.[2] Meanwhile, in Indonesia, the incidence reaches 33.3%. It is higher than the prevalence rate in ASEAN, which ranges from 2.1% to 31.3%.[3] In addition, pressure ulcers pose a severe problem due to the time-consuming and expensive treatment. For example, second-degree pressure ulcers can extend hospital stays by an average of

Alamat Korespondensi *lorettha.wijaya@atmajaya.ac.id*

eight days, significantly disrupting the healing process and increasing medical costs.[4]

Pressure ulcers occur when prolonged pressure on the skin or soft tissue leads to tissue damage or necrosis.[5] This pressure occurs on the skin and subcutaneous tissue between bone protrusions and surfaces of objects such as mattresses, wheelchair cushions, or medical devices. If significant pressure of more than the arterial capillary refill pressure (about 32 mmHg) and the venous capillary outflow pressure (about 8 to 12 mmHg) is created, blood flow becomes obstructed, resulting in tissue hypoxia and, ultimately, ulcer formation.[6]

Apart from prolonged pressure, various factors contribute to developing pressure ulcers. Limited mobility, decreased sensory perception, and reduced tissue tolerance in bedridden patients can increase the risk of developing pressure ulcers.[7] Tissue tolerance factors include intrinsic and extrinsic factors. Low nutritional intake and aging are intrinsic factors that can affect the thickness of the skin layer, thereby increasing the risk of pressure ulcers. The extrinsic factors, such as constant friction and skin shifting, cause the protruding bones to press on the skin and blood vessels, leading to pressure ulcers.[8,9] These risk factors can be assessed using the Braden Scale, a screening tool that has a score ranging from 6 to 23, with lower scores indicating higher risk.[10]

The National Pressure Ulcer Advisory Panel (NPUAP) 2014 stated that pressure ulcers can be prevented by taking 4 actions, one of which is preventive skin care, with olive oil being a prominent option.[11] Critical evaluations of the assumptions and knowledge of the field, and description of the methodology used to develop guideline. This Quick Reference Guide is intended for busy health professionals who require a quick reference in caring for individuals in the clinical setting. Users should not rely on excerpts from the Quick Reference Guide alone. -- Foreword (page [1] Olive oil is readily available and more cost-effective compared to other moisturizers. Additionally, olive oil has properties that can help maintain skin moisture and elasticity to reduce friction between the skin of bedridden patients and the outer surface.[6] Laily, *et al*., (2019) showed a reduced risk of pressure ulcers among their 15 respondents after using olive oil.[7] However, Fallahi, *et al*., (2022) showed that 20 out of 60 respondents still developed grade I pressure ulcers, which means that olive oil is not always effective in reducing the risk of pressure ulcers.[12] These differences in results necessitate a review of whether olive oil is beneficial in reducing risk factors and preventing the development of pressure ulcers in bedridden patients.

METHODS

A systematic review study based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Guidelines was performed.[13] Ethical clearance was obtained from the Research Ethics Commission of the Atma Jaya Catholic University of Indonesia (No. 02/05/KEP-FKIKUAJ/2022). Literature was collected from four databases (Google Scholar, ProQuest, ScienceDirect, and OpenGrey) using the following keywords: "decubitus ulcer", "pressure ulcer", "bedsore", "intensive care", "critical care", "bedridden", "immobile", and "olive oil".

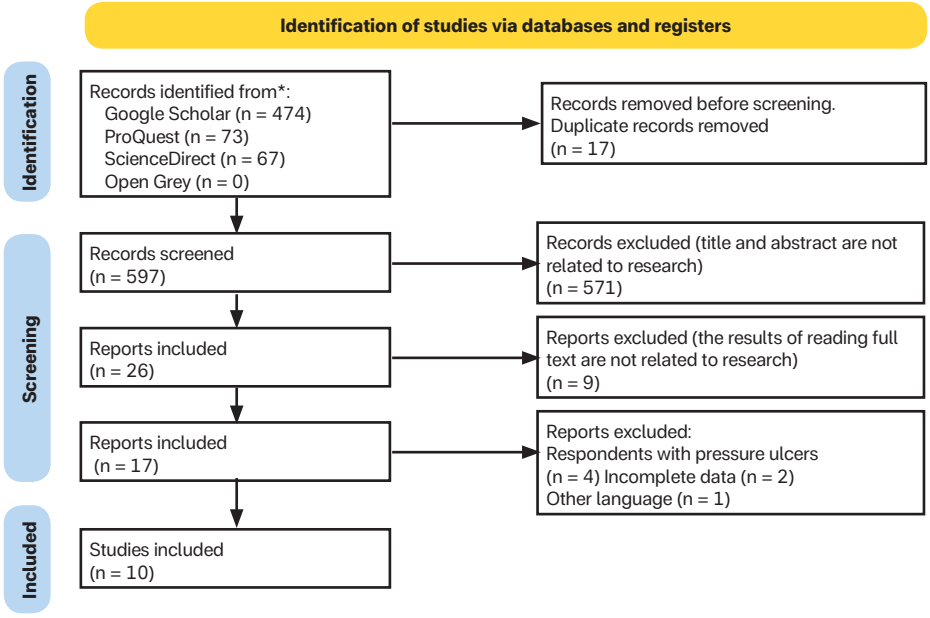
The inclusion criteria for this study were literature that assessed the use of olive oil in preventing pressure ulcers in bedridden patients; risk factors for developing pressure ulcers measured using the Braden scale risk assessment, published in English and/or Indonesian language from March 2012 to March 2025, and accessible full text with research designs of randomized controlled trials (RCT), cross-sectional, and experimental studies. The exclusion criteria were literature with a sample population with pressure ulcers; using risk assessment other than the Braden scale, a duration of hospitalization of less than 2 days, and research designs of literature review, systematic review, and meta-analysis.

All duplicate articles were eliminated, and the remaining literature was screened by reviewing titles and abstracts, then selected based on alignment with the research topic and the predetermined inclusion and exclusion criteria. The literature search process used PRISMA flow diagrams.[14] Data extraction was performed independently and in a blinded manner by two reviewers (MVI and LW). Both reviewers screened full-text articles and extracted data using a predefined extraction table. The extracted variables included first author, year of publication, country of study, study design, sample size, participant characteristics, intervention details, control, duration of intervention, outcomes measured using the Braden Scale Score, and conclusion. Discrepancies between reviewers were resolved through discussion. If consensus could not be reached, a third reviewer (DAS, RY, W, or AC) was consulted to achieve agreement.

RESULTS

Study Selection

The study selection process is illustrated in **Scheme**. A total of 614 studies were



Scheme. PRISMA flow diagram.

identified through the database search. After removing 17 duplicates, 597 studies remained for screening. Of these, 587 studies were excluded due to irrelevant topics, ineligible study designs, or incomplete data. Ten studies met the inclusion criteria for this review.

Study Characteristics

Ten studies included were from 3 countries, i.e., 2 from Iran,[12,15] one from Egypt,[16] and 7 from Indonesia.[7,17-22] All studies discussed the benefit of olive oil in preventing pressure ulcers in bedridden patients; 2 studies were RCT,[12,15] while 8 were non-randomized studies.[7,16-22] Among these non-randomized studies, 5 employed quasi-experimental designs with control groups,[7,18-20,22] while 3 used one-group pre–post test design without control groups.[16,17,21] The control groups varied across studies and included standard nursing care, mobilization, alternative oils, or bathing routines. The sample sizes ranged from 12 to 240 participants, with a total of 662 participants. Participants' ages ranged from 20 to 80 years old. Each study's intervention duration varied from 3 to 60 days. The characteristics of the participants in the study are stated and presented in **Table 1.**

Four studies applied olive oil with massage;[16,17,19,21] 5 other studies only applied the olive oil gently on the skin surface,[7,12,18,20,22] and 1 study utilized a soaked gauze.[15] Four studies combined the intervention of olive oil application with patients' mobilization.[18,19,21,22] The intervention durations for each study are outlined in **Table 2**. All the studies used the Braden Scale Score to evaluate the risks of developing pressure ulcers compared to the pre-intervention or control group.

Risk of Bias within Studies

We performed quality and risk of bias assessment using the revised Cochrane risk of bias tools for randomized trials 2 (RoB 2)[23] for RCTs studies and risk of bias in non-randomized studies of interventions (ROBINS-I)[24] for quasi-experimental studies. Two RCT studies showed concern about bias due to deviations from the intended intervention, with a low risk of bias overall. Eight other studies' risk of bias using ROBINS-I showed a low risk of bias. However, several non-randomized studies involved varying control interventions and potential co-interventions, which may introduce bias related to deviations from intended interventions (Domain 4). Therefore, the results should be interpreted with caution. The results of the risk-of-bias assessments for each study are summarized in two figures **(Figure 1 and Figure 2).**

Results of Studies

The results of the included studies were summarized based on Braden Scale score outcomes. Seven of ten studies reported that olive oil application reduced the risk of pressure ulcers, as evidenced by increased Braden Scale Scores. Details of outcome interventions are presented in **Table 2**. All studies were of low risk of bias according to the RoB 2 and ROBINS-I assessment tools.

DISCUSSION

This systematic review evaluates the effectiveness of olive oil in reducing pressure ulcer risk factors and preventing the development of pressure ulcers. Ten studies assessed as having a low overall risk of bias according to RoB 2 and ROBINS-I tools were included in this review. Two RCTs studies[12,15] did not report post-intervention Braden scale scores; therefore, changes in pressure

Risk of Bias Domains

Study	D1	D2	D3	D4	D5	Overall
Karimi, *et al.*, 2020.[15]	+	−	+	+	+	+
Fallahi, *et al.*, 2022.[12]	+	−	+	+	+	+

Domains:
D1: Bias arising from the randomization process.
D2: Bias due to deviations from intended intervention.
D3: Bias due to missing outcome data.
D4: Bias in measurement of the outcome.
D5: Bias in selection of the reported result.

Judgement
− Some concerns
+ Low

Figure 1. Risk of bias summary (RoB 2).

Risk of Bias Domains

Study	D1	D2	D3	D4	D5	D6	D7	Overall
Ayoub, *et al.*, 2018.[16]	−	+	+	+	+	−	+	+
Nisak, *et al.*, 2019.[17]	−	+	+	+	+	−	+	+
Laily, *et al.*, 2019.[7]	−	+	+	+	+	−	+	+
Meliza, *et al.*, 2020.[18]	−	+	+	+	+	−	+	+
Negari, *et al.*, 2022.[19]	−	+	+	+	+	−	+	+
Kustina, *et al.*, 2022.[20]	−	+	+	+	+	−	+	+
Aryani, *et al.*, 2022.[21]	−	+	+	+	+	−	+	+
Suci, *et al.*, 2023.[22]	−	+	+	+	+	−	+	+

Domains:
D1: Bias due to confounding.
D2: Bias due to seletion of participants.
D3: Bias in classification of interventions.
D4: Bias due to deviations from intended interventions.
D5: Bias due to missing data.
D6: Bias in measurement of outcomes.
D7: Bias in selections of the reported result.

Judgement
− Moderate
+ Low

Figure 2. Risk of bias summary (ROBINS-I).

Table 1. Characteristics of participants of the included study.

No	Author	Year	Location	Design	Sample	Age Mean/ Range (Year)	Number of Samples	Intervention Duration
1	Ayoub, *et al.*[16]	2018	Egypt	One-group pre–post test design	Bedridden patients over 60 years old, no pressure ulcers, female	60–64 = 24 Patients 65–79 = 50 Patients > 80 = 22 Patients	Intervention: 96 (pre-post Test)	5 days
2	Nisak, *et al.*[17]	2019	Indonesia	One-group pre–post test design	Bedridden patients, diagnosed with critical illness, no pressure ulcers.	< 60 = 5 Patients > 60 = 7 Patients	Intervention: 12 (pre-post Test)	5 days
3	Laily, *et al.*[7]	2019	Indonesia	Quasi-experimental	Bedridden patients, no pressure ulcers.	40–60 = 10 Patients 61–80 = 20 Patients	Intervention: 15 Control: 15	5 days
4	Karimi, *et al.*[15]	2020	Iran	RCT	All ICU patients over 18 years old, no pressure ulcers but at medium-high risk (Braden scale score 9–14).	± 43,15	Intervention (olive oil): 15 Intervention (fish oil): 15	7 days
5	Meliza, *et al.*[18]	2020	Indonesia	Quasi-experimental	Bedridden patient, no pressure ulcers, no history of oil allergies.	36–45 = 5 Patients 46–55 = 12 Patients 56–65 = 30 Patients > 65 = 17 Patients	Intervention: 32 Control: 32	7 days
6	Fallahi, *et al.*[12]	2022	Iran	RCT	All ICU patients over 18 years old, no edema, no pressure ulcers, but at medium-high risk (Braden scale score 9–14).	± 56,27	Intervention (olive oil): 60 Intervention (aloe vera): 60 Intervention (olive oil+aloe vera): 60 Control: 60	30 days
7	Negari, *et al.*[19]	2022	Indonesia	Quasi-experimental	Bedridden patients, no pressure ulcers.	± 51,98	Intervention: 20 Control: 20	60 days
8	Kustina, *et al.*[20]	2022	Indonesia	Quasi-experimental	Bedridden patients, no pressure ulcers, hospitalized for more than 12 hours.	± 61,09	Intervention (olive oil): 17 Intervention (almond oil): 17	3 days
9	Aryani, *et al.*[21]	2022	Indonesia	One-group pre–post test design	Bedridden patients in ICU, hospitalized for more than 2 days and less than 5 days, no pressure ulcers, with a Braden Scale Score < 18, no fever, no oil allergies.	20–35 = 4 Patients 36–51 = 11 Patients 52–68 = 15 Patients	Intervention: 30 (pre-post Test)	7 days
10	Suci, *et al.*[22]	2023	Indonesia	Quasi-experimental	Hospitalized patients with ischemic stroke	36–45 = 5 Patients 46–55 = 12 Patients 56–65 = 32 Patients >65 = 17 Patients	Intervention: 33 Control: 33	14 days

Table 2. Characteristics of intervention and outcome of the included study.

No	Author	Year	Title	Pressure Ulcers Intervention Method	Braden Scale Score	Conclusion
1	Ayoub, *et al.*[16]	2018	Effect of Olive Oil Massage in Prevention of Pressure Ulcer among Hospitalized Immobilized Elderly	Intervention: Massage olive oil on pressured body areas 3 times daily for 5 days.	Intervention (pre-test) - High risk = 14 - Low risk = 82 Intervention (post-test) - High risk = 22 - Low risk = 74	The use of olive oil has no benefit in reducing the risk of pressure ulcers according to the Braden scale, but it can prevent the development of pressure ulcers in all respondents for 5 days.
2	Nisak, *et al.*[17]	2019	Aplikasi *Massage Olive Oil* untuk Mencegah Dekubitus pada Pasien Kritis di Ruang *Intensive Care Unit* Rumah Sakit Umum Pusat dr. Soeradji Tirtonegoro Klaten	Intervention: Massage 15 mL olive oil on pressured body areas daily for 5 days.	Intervention (pre-test) - Very high risk = 5 - High risk = 6 - Moderate risk = 1 - Low risk = 0 Intervention (post-test) - Very high risk = 1 - High risk = 9 - Moderate risk = 2 - Low risk = 0	The use of olive oil has a benefit in reducing the risk of pressure ulcers according to the Braden scale ($p < 0.05$) and prevents the development of pressure ulcers in all respondents for 5 days.
3	Laily, *et al.*[7]	2019	Pengaruh Penggunaan Extra Virgin Olive Oil pada Pencegahan Luka Dekubitus pada Pasien Berisiko dengan Skala Braden	Intervention: Gently apply olive oil on pressured body areas 2 times a day for 5 days. Control: No information	a. Intervention (pre-test) - Very high risk = 9 - High risk = 5 - Moderate risk = 1 Intervention (post-test) - Very high risk = 2 - High risk = 3 - Moderate risk = 1 - Low risk = 6 - No risk = 3 b. Control (pre-test) - Very high risk = 9 - High risk = 5 - Moderate risk = 1 Control (post-test) - Very high risk = 6 - High risk = 7 - Moderate risk = 2	The use of olive oil has a benefit in reducing the risk of pressure ulcers according to the Braden scale ($p < 0.05$) and prevents the development of pressure ulcers in all respondents for 5 days.
4	Karimi, *et al.*[15]	2020	The Effect of Using Olive Oil and Fish Oil Prophylactic Dressings on Heel Pressure Injury Development in Critically Ill Patients	Wrapped gauze soaked with 4 mL olive oil/fish oil around both heels once a day for 7 days.	The Braden score mean before intervention: - Olive oil group = 9,2 - Fish oil group = 8,3	Using olive oil and fish oil can prevent pressure ulcers in all respondents for 7 days. Both oils had the same effect in preventing pressure ulcers ($p > 0.05$).

No	Author	Year	Title	Pressure Ulcers Intervention Method	Braden Scale Score	Conclusion
5	Meliza, *et al.*[18]	2020	The Prevention of Ulcers Decubitus with Mobilization and the Usage of Olive Oil on Stroke Patients	Intervention: Gently apply 15 mL of olive oil on pressured body areas 2 times a day for 7 days with frequent mobilization. Control: Frequent mobilization	a. Intervention (pre-test) - Very high risk = 4 - High risk = 19 - Moderate risk = 9 - Low risk = 0 Intervention (post-test) - Very high risk = 0 - High risk = 0 - Moderate risk = 8 - Low risk = 24 b. Control (pre-test) - Very high risk = 3 - High risk = 20 - Moderate risk = 9 - Low risk = 0 Control (post-test) - Very high risk = 2 - High risk = 21 - Moderate risk = 9 - Low risk = 0	The use of olive oil significantly reduced the risk of pressure ulcers according to the Braden scale compared to the control group ($p >$ 0.05). Pressure ulcers did not develop in all respondents for 7 days.
6	Fallahi, *et al.*[12]	2022	Comparative Evaluation of the Effect of Aloe Vera Gel, Olive Oil, and Compound Aloe Vera GelOlive Oil on Prevention of Pressure Ulcer: A Randomized Controlled Trial	Intervention: Gently apply 10–15 mL olive oil/aloe vera/ compound olive oil-aloe vera on pressured body area 3 times a day for 30 days. Control: Maintain cleanliness, provide adequate nutrition, frequent mobilization, and routinely observe skin using NPUAP Scale	Braden score mean before intervention: - Olive oil group = 11,37 - Aloe vera group = 11,47 - Compound olive oil-aloe vera group = 11,33 - Control group = 11,02	Pressure ulcers occurred in some samples after 30 days of intervention. In the olive oil group there were 20% of the samples ($p <$ 0.05) who developed pressure ulcers, in the aloe vera group it developed in 33.3% of the samples ($p >$ 0.05), in the compound olive oil-aloe vera group the in 16.7% of the sample ($p <$ 0.05), and in the control group it developed in 36.6% of the sample.
7	Negari, *et al.*[19]	2022	Pengaruh *Massage Effleurage* dengan *Olive Oil* (Minyak Zaitun) terhadap Pencegahan Dekubitus pada Pasien *Bedrest* di Ruang HCU Anggrek 2 RSUD dr. Moewardi	Intervention: Massage olive oil on pressured body areas 2 times a day for 60 days with mobilization every 2 hours. Control: Bath 2 times a day with frequent mobilization	Braden score mean before intervention: - Intervention = 11,8 - Control = 13,45 Braden score mean after intervention: - Intervention = 12,75 - Control = 9,7	The use of olive oil has a benefit on reducing the risk of pressure ulcers according to the Braden Scale ($p <$ 0.05) and prevent the development of pressure ulcers in all respondents for 60 days.

No	Author	Year	Title	Pressure Ulcers Intervention Method	Braden Scale Score	Conclusion
8	Kustina, *et al.*[20]	2022	Perawatan Kulit dengan Minyak Zaitun dan Minyak Almond Menurunkan Status Risiko Dekubitus	Gently apply 4 mL olive oil/almond oil on pressured sacrum areas 2 times a day for 3 days.	Braden score mean before intervention: - Olive oil group = 13,71 - Almond oil group = 13,35 Braden score mean after intervention: - Olive oil group = 16,12 - Almond oil group = 14,82	The use of olive and almond oil can reduce the risk of pressure ulcers according to the Braden Scale for 3 days. The two oils had no significant different effect on preventing pressure ulcers ($p > 0.05$).
9	Aryani, *et al.*[21]	2022	Pengaruh Pemberian Minyak Zaitun dan Pengaturan Posisi Miring 30 Derajat terhadap Kejadian Decubitus pada Pasien Stroke: Studi Eksperimen	Gently apply olive oil once a day for 7 days and tilt patient's position 30 degrees	Intervention (pre-test) - Very high risk = 0 - High risk = 8 - Moderate risk = 8 - Low risk = 14 Intervention (post-test) - Very high risk = 0 - High risk = 4 - Moderate risk = 4 - Low risk = 22	Using olive oil and tilting the patient's position 30 degrees reduces the risk of pressure ulcers according to the Braden scale ($p = 0.001$).
10	Suci, *et al.*[22]	2023	Pengaruh Pemberian Mobilisasi Dini dan *Massage Olive Oil* terhadap Risiko Dekubitus pada Pasien *Stroke* di RSUD Dr. R. Sosodefforo Djatikoesoemo Bojonegoro	Intervention: Early mobilization and olive oil massage for 2 weeks Control: No Information	a. Intervention (pre-test) - High risk = 17 - Moderate risk = 14 - Low risk = 2 Intervention (post-test) - High risk = 8 - Moderate risk = 10 - Low risk = 15 b. Control (pre-test) - High risk = 18 - Moderate risk = 13 - Low risk = 2 Control (post-test) - High risk = 15 - Moderate risk = 10 - Low risk = 8	Early mobilization and olive oil massage reduced the risk of pressure ulcers significantly ($p < 0.001$) between pre- & post-test. At the same time, the differentiation in the control group was not significant ($p > 0.05$).

ulcer risk could not be assessed in these studies. The remaining 8 studies suggested a beneficial effect of olive oil in preventing pressure ulcers, particularly in reducing pressure ulcer risk factors. Among these studies, 7 reported a decrease in pressure ulcer risk factors, [7,17,18-22] while one reported an increased risk factor.[16] However, these findings were predominantly derived from non-randomized studies, including one-group pre–post test designs and studies with heterogeneous control interventions, and should therefore be interpreted with caution.

Ayoub, *et al*., (2018) showed an increase in pressure ulcer risk factors from low risk (score 15–18) to high risk (score 10–12) in 8 of 96 participants, Notably, all participants in the study were aged over 60 years, a population known to be at higher risk for pressure ulcer development.[16] According to Jaul (2010), aging impacts skin structure, causing loss of skin elasticity, thinning of the subcutaneous layer, reduction of muscle mass, and decreased intradermal vascular perfusion and oxygenation. These changes increase the susceptibility to pressure ulcers in the elderly.[25] Despite the increased risk factors, none of the participants developed pressure ulcers after using olive oil for 5 days.[16] This

study suggests that olive oil can prevent the development of pressure ulcers in elderly bedridden patients.

Six out of seven other studies which showed a decrease in risk factors had none of the participants developing pressure ulcers, while 1 study by Fallahi, *et al*., (2022) showed that pressure ulcers still developed in 20% of participants given olive oil.[12] This is presumably because the duration of observation was longer (30 days) than the other studies (3 to 7 days). Said, *et al*., (2013) demonstrated a significant association between the duration of hospitalization and the incidence of pressure ulcers development.[26] However, the number of participants who developed pressure ulcers in the control group was almost double (36.6%) compared to the intervention group. Pressure ulcers also occurred faster in the control group. The average duration of pressure ulcers development in the control group was 7.18 ± 3.03 days, while in the intervention group was 9.16 ± 0.57 days.[12] This is in accordance with the study conducted by Madadi, *et al*., (2015), where the average duration of pressure ulcers development in the control group (15.46 ± 7.40 days) was also faster than the group given olive oil (18.73 ± 5.36 days).[27] These findings suggest that the use of olive oil is effective in preventing pressure ulcer development.

Negari, *et al*., (2022) conducted a study with a follow-up duration of 60 days and none of the participants developed pressure ulcers. Compared to Fallahi, *et al*., who solely applied olive oil topically, Negari, *et al*., employed an effleurage massage technique alongside mobilization of the patient's position every 2 hours.[12,19] Effleurage massage offers numerous benefits such as enhancing skin, muscle, and nerve function, improving blood circulation, inducing relaxation, and alleviating pressure on the body.[28] Effleurage massage with olive oil and patient mobilization prevents pressure ulcers.[28-32]

This systematic review highlights the effectiveness of olive oil in reducing risk factors and preventing pressure ulcers among bedridden patients. Pressure ulcers, a common medical complication in such patients, can impede recovery by increasing pain and infection risk, prolonging hospital stays, and escalating treatment costs. Given the high incidence of pressure ulcers in bedridden patients, preventive measures like olive oil intervention are crucial. Olive oil, rich in oleic acid and vitamin E, nourishes and preserves skin elasticity, making it an effective option for preventing pressure ulcers in bedridden patients. Additionally, olive oil offers moisturizing benefits, exhibits anti-inflammatory effects, and shows promising results in enhancing skin integrity.[33]

This systematic review has several limitations. Eight out of ten studies[7,16-22] were non-randomized, including three one-group pre–post test studies without control groups,[16,17,21] which may limit internal validity. Although 5 studies used quasi-experimental designs with control groups,[7,18-20,22] the lack of randomization and the presence of varying control interventions and potential co-interventions may introduce bias related to deviations from intended interventions (Domain 4). In addition, heterogeneity in intervention protocols, duration of intervention, outcome measures, and participant characteristics, particularly age, may have influenced the results.

Based on these limitations, future studies should employ well-designed RCTs studies with standardized interventions protocols and uniform intervention durations to minimize bias and improve comparability across studies. Clear definition of control conditions, consistent use of validated outcome measures such as post-intervention Braden scale scores, and consideration of age stratification are also recommended to enhance methodological rigor and strengthen the evidence.

CONCLUSION

This systematic review suggests that olive oil may have a beneficial effect in preventing pressure ulcers. Based on the analysis of the included studies, the majority of studies (9 out of 10) reported an association between olive oil application and a reduction in pressure ulcer risk factors and/or a lower incidence of pressure ulcers among bedridden patients. However, not all studies demonstrated consistent findings, and the overall strength of the evidence remains limited due to variations in study design and methodology.

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AUTHORS' CONTRIBUTION

The literature selection was conducted independently by MVI and LW. Disagreements were resolved by discussion and input from other authors (RY, DAS, W, and AC). Data from the included studies were extracted and tabulated, and the risk of bias for each study was assessed independently by MVI and LW. Disagreements were resolved by discussion between the two authors and input from other authors (RY, DAS, W, and AC). MVI and LW carried out an analysis using tabulation of the study intervention characteristics and comparing against the planned groups for each study with the *p*-value of the studies. Manuscript preparation was conducted based on joint discussions among all authors (MVI, LW, RY, W, DAS, and AC).

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