INTERNATIONAL JOURNAL OF HOLISTIC CARE

JOURNAL HOMEPAGE : HTTPS://JOURNAL.HAZIQCORP.COM/INDEX.PHP/IJHC

Effectiveness of Maggot Therapy on Wound Healing Process : *A Systematic Review*

Revydo Syaaqi Ash-Shidiqi[1*], Nisya Konita[1], Tira Wahyuni[1], Ida Rosidawati[1], Bayu Brahmantia[1]

[1] Nursing Department, Faculty of Health Science, Universitas Muhammadiyah Tasikmalaya, 46191, Indonesia

OPEN ACCESS

International Journal of Holistic Care

Volume 1 No.2 Page. 44- 53

Article Info

Submit	:	01 January 2025
Revision	:	06 March 2025
Accepted	:	20 June 2025
Available Online	:	31 July 2025

Corresponding Author

syaaqiashshidiqi01@gmail.com

Website

International Journal of Holistic Care

P-ISSN : -

E-ISSN :-

ABSTRACT

Chronic injuries are a global health problem with an increasing prevalence and have a significant impact on patients' quality of life and the burden on the health system. One of the innovations in wound management is maggot therapy (*maggot lucilia sericata*), which has been used to speed up the wound healing process through biological debridement mechanisms and antimicrobial effects. This article aims to find out the effectiveness of maggot therapy on the healing process of chronic wounds. The method used in this study was a literature review of 6 (six) related articles taken from Google Scholar, BMC Medicine, and PubMed. Articles are selected based on predetermined inclusion and exclusion criteria. Based on the search results, 6 articles with a publication range of 2020–2025 were determined. Inclusion criteria include *Randomized Controlled Trials* (RCT) and *True Experimental studies* in patients with chronic wounds, discuss maggot therapy, and are available in full text in English. The results of the analysis of six articles showed that maggot therapy significantly accelerated the healing process of chronic wounds, especially in the case of diabetic ulcers and severe infectious wounds. The average time for wound healing with maggot therapy is achieved in 1–2 months (30–60 days), faster than conventional methods. The conclusion of the study results shows that maggot therapy is an effective, safe, and economical intervention in accelerating the healing process of chronic wounds. The use of this therapy is recommended as an alternative or complement to conventional wound care methods, especially in wounds that are difficult to heal with standard therapy.

Keywords : Maggot Therapy, Wound Healing, Chronic Wound

INTRODUCTION

Chronic injuries are a global health problem with an increasing prevalence and have a significant impact on patients' quality of life and the burden on the health system. Chronic wounds, such as diabetic ulcers, venous ulcers, and decubitus, are often difficult to heal with conventional therapy, increasing the risk of infection, amputation, and long-term care costs.

According to *the World Health Organization*, the incidence of injuries in the world continues to increase every year, both acute and chronic injuries. In the United States, the prevalence of wounds reaches 3.5 per 1,000 population, with the majority of cases caused by surgery/trauma (48%), foot ulcers (28%), and cubitudal wounds (21%). Global data in 2022 recorded a high number of injury cases based on causes, including surgical wounds (11,030 million), trauma (160 million), abrasions (2,040 million), burns (10 million), decubitus ulcers (850 million), venous ulcers (1,250 million), diabetic ulcers (13.5 million), amputations (20 million), and cancer-related cases such as carcinoma and melanoma 60 million and 10 million, respectively. This confirms that wounds, especially chronic ones, are a significant global health problem (. Sukma Arda, 2025)

According to the Indonesian Ministry of Health (2018), the prevalence of injuries in Indonesia reached 8.2%. The most common type of wound was abrasions or bruises due to friction with rough surfaces (70.9%), followed by cuts due to sharp objects (25.4%) and lacerations due to impact with blunt objects (23.2%). This data shows a high incidence of minor to moderate injuries in the community. (Sukma Arda, 2025)

A wound can be defined as a disturbance or damage to the integrity and function of tissues in the body. Wounds are a condition that is often encountered in daily life. A wound is a damage to the protective function of the skin followed by loss of continuity of epithelial tissue and or without damage to other tissues such as muscles, bones and nerves caused by several factors, such as: pressure, incisions and surgical wounds. (Thanks, 2023)

Wound healing is an organism's response to tissue or organ damage, as well as an attempt to return it to a homeostatic state where the process of remodeling skin tissue is determined by the formation of a functional epithelium that covers the wound and can produce physiological stabilization of the tissue or organ. (Munandar, 2022) .

The wound healing process can be hampered by various factors, both internal and external. These factors include the presence of comorbidities, infections, age, body composition, nutritional status, smoking habits, certain medications, psychological conditions, social environment, environmental cleanliness, access to wound care, and previous wound care history. All of these factors are interrelated and can affect the speed and success of the wound healing process. (Ariningrum & Subandono, 2023) .

In theory, all wounds can heal in the same way, although the way in which they are treated will differ based on wound health, aggravating circumstances, and environmental variables. This is also in accordance with the opinion of McLain et al., 2021 in Munandar, 2022 effective wound management includes efforts to maintain wound moisture, control infection, absorb excess fluid, support the removal of dead tissue (autolysis debridement), and keep wound conditions sterile and cost-effective. The selection of proper wound cleaning fluids and the use of appropriate antimicrobial dressings are also important to speed up healing and prevent complications.

One method of wound healing is maggot therapy or maggot therapy, which has been used since the 1930s to clean soft tissue lesions. This therapy has been shown to be effective in treating various types of wounds with gangrene or necrotic tissue. Maggots aid in wound healing by reducing the number of bacteria through the process of

digestion, extreme production, and destruction of biofilms. (Malekian et al., 2019)

Maggot therapy is a method of treating chronic wounds that uses sterile fly larvae, specifically*Lucilia sericata*and*Lucilia cuprina*, to speed up the wound healing process through the debridement mechanism (removal of necrotic tissue) selectively without damaging healthy tissue. These larvae secrete proteolytic enzymes that dissolve dead tissue and produce antimicrobial substances that effectively reduce the number of pathogenic bacteria in the wound, thereby accelerating the formation of granulated tissue and wound healing. It also lowers wound secretion and reduces the risk of infection, making it a safe, efficient, and economical alternative especially for diabetic wounds that are not responsive to conventional therapies (Harahap et al., 2024).

The results of the study of Jafari et al., (2022) showed that the use of maggot therapy in the treatment of chronic diabetic wounds significantly improved wound healing, with a significant decrease in wound size ($p<0.001$). The group that received maggot therapy showed better improvement in inflammation than the control group. This therapy also plays a role in supporting the four phases of wound healing, namely hemostasis, inflammation, proliferation, and remodeling.

This study is in line with research conducted by Siavash et al., (2020) with results showing that maggot therapy effectively cures 83.3% of atypical diabetic ulcers in an average of 1.79 ± 0.8 months. A total of 31 out of 35 patients recovered in ≤5 sessions. While 4 patients required 10–15 sessions. The size of the wound decreased significantly ($p \leq 0.0001$), accompanied by an increase in granulated tissue.

The problem of chronic injuries has become a major challenge in the world of health, not only at the national level, but also globally. The increasing incidence of chronic injuries, both due to metabolic diseases such as diabetes and due to trauma and surgical factors, brings serious consequences: a high risk of infection, amputation, a decrease in quality of life, and a significant economic burden on patients and the health system. Maggot therapy is present as an alternative solution that is scientifically proven to be able to speed up the healing process, reduce the risk of infection, and reduce the need for surgical intervention and the use of antibiotics. However, the implementation of this therapy in Indonesia is still very limited, both in terms of knowledge of health workers, patient admission, and availability of facilities.

The administration of maggot therapy to wound patients is essential to speed up and increase the effectiveness of wound healing. This therapy does not cause side effects and can even reduce the need for antibiotic use, because maggots produce a natural antibiotic substance, namely allantoin, which helps fight infection in wounds. Therefore, the purpose of *this literature review* is to find out about "The Effectiveness of Maggot Therapy on the Wound Healing Process".

METHOD

The data sources in this literature review study were obtained through an electronic search on April 26, 2025, using three main databases: Google Scholar, BMC Medicine, and PubMed. The search strategy uses a combination of keywords: "*maggot therapy*" AND "*wound healing*" AND "*chronic wound*", the year of publication of the article is limited to 2020 to 2025. Each article found is selected based on predetermined inclusion and exclusion criteria. The selection was carried out with reference to the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) framework.

Included articles must meet the following inclusion criteria: (a) involve patients with chronic wounds, (b) use a *Randomized Controlled Trial* (RCT), *True Experimental*

research design, (c) discuss maggot therapy in the context of wound healing, (d) be published in the 2020–2025 time frame, (e) be written in or English, and (f) be available in full *text*.

The exclusion criteria include: (a) articles that do not discuss the effects of maggot therapy on the wound healing process, (b) studies conducted on animal models or cultured cells, (c) articles in the form of *literature reviews*, (d) articles that do not use English, (e) articles published outside the 2020–2025 period, and (f) articles that are not available in full *text*). After the selection process based on these criteria, six relevant articles were selected regarding the effectiveness of maggot therapy on the healing process of chronic wounds.

RESULTS

The results show that 6 (Six) articles with Randomized Controlled Trial *(RCT) and* True Experimental *designs* discussing the effectiveness of maggot therapy in wound healing were identified from three databases based on search results. After going through a screening process according to the inclusion and exclusion criteria, the main information from each selected article is extracted and grouped. Data were analyzed based on the following variables: author name, year of publication, research location, study design, objectives, number and characteristics of samples, research instruments, type of intervention carried out, and main findings. The results of the data extraction can be seen in table 1.

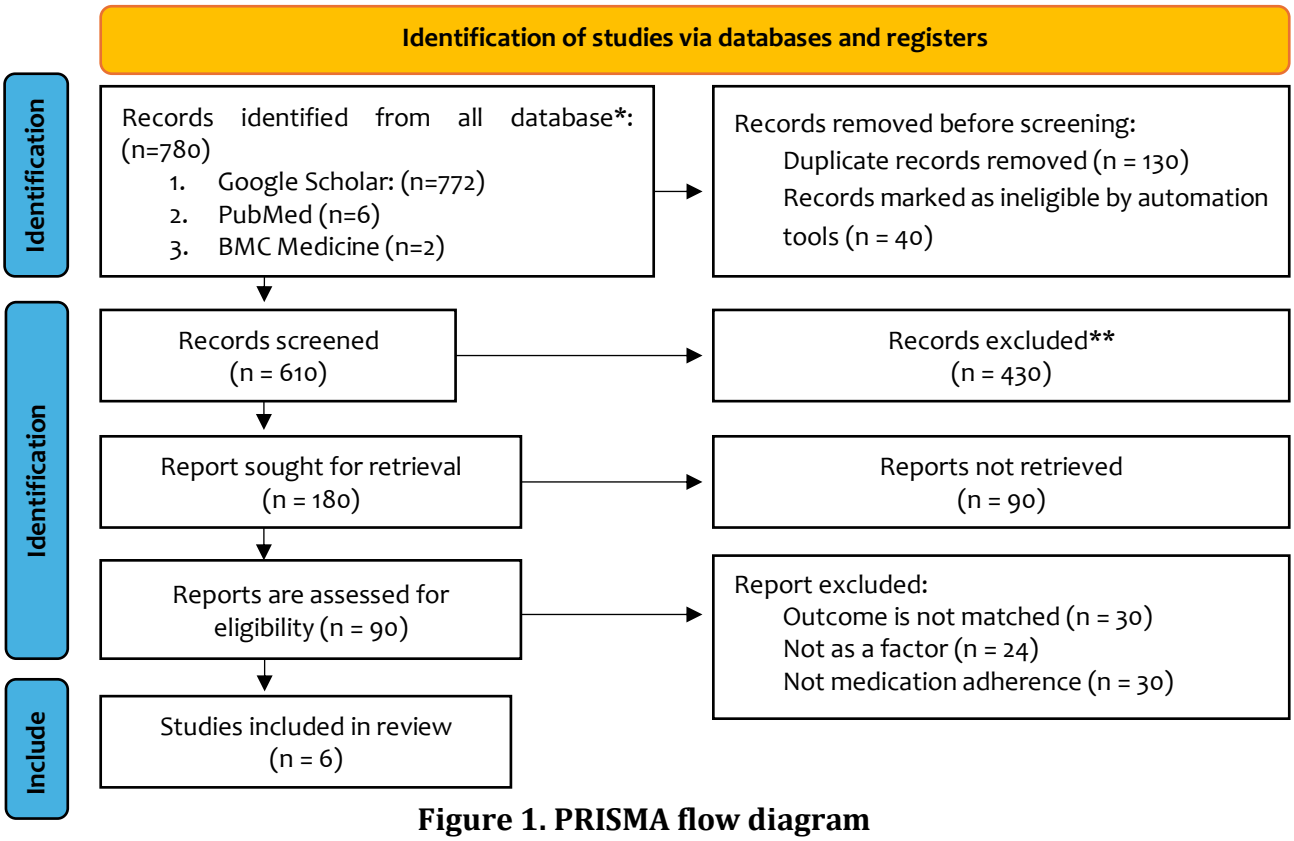

Figure 1. PRISMA flow diagram

Table 1 Data Extraction Results

Yes	Author, Year	Place	Design Research	Purpose	Sample	Research instruments	Healing duration	Results
1.	Effects of Lucilia sericata Maggot Therapy in Chronic Wound Treatment: A Randomized Clinical Trial (Nezakati et al., 2020)	Imam Hossain and Khatam-AL-Anbia hospitals in Shahroud, Iran	RCT	Evaluating the therapeutic effect of Maggot Lucilia sericata in the treatment of chronic wounds.	90 People	Clinical observation of wounds, smears and cultures for bacterial identification, as well as Doppler ultrasound for vascular evaluation. The data were analyzed using the Chi-square test with SPSS version 16.	21 Days	Maggot Lucilia sericata showed the highest antimicrobial effect against P. aeruginosa and lowest against Enterococcus. The rate of wound healing and reduction of necrotic tissue in the intervention group was significantly higher than controls at week 2 (p=0.041) and 3rd (p=0.012).
2.	Efficacy of Maggot Debridement Therapy on Refractory Atypical Diabetic Foot Ulcers: An Open-Label Study (Siavash et al., 2020)	Khorshid Hospital, Isfahan, Iran, which is a teaching hospital under Isfahan University of Medical Sciences.	RCT	Evaluating the effectiveness of MDT as a modern debridement alternative in atypical diabetic foot ulcers that do not respond to conventional therapy; This therapy is considered safe, selective, and affordable.	42 People	The effectiveness of larval therapy (MDT) in diabetic ulcers was evaluated by measuring the size of the wound before each therapy session and recording the total healing time. The analysis was conducted using the Wilcoxon signed-rank test with SPSS version 20.	54 days	Maggot therapy effectively cures 83.3% of atypical diabetic ulcers in an average of 1.79 ± 0.8 months. A total of 31 out of 35 patients recovered in ≤5 sessions. While 4 patients required 10–15 sessions. The size of the wound decreased significantly ($p \leq 0.0001$), accompanied by an increase in granulated tissue.
3.	Microbiological effects in patients with leg ulcers and diabetic foot treated with Lucilia sericata maggote (Szczepanowski et al., 2022)	ChirMedicus Doctor's Surgery, Kedzierzyn-Kozle, Poland	*True Experimental*	To evaluate the changes in wound microflora in diabetic lower leg and leg ulcers treated using MDT (Lucilia sericata), as well as to compare their effects with ozone therapy.	129 People	Microbiological swabs of the wound were performed before and after therapy (MDT/ozone) after cleaning with 0.9% NaCl. Samples were sent using the Stuart medium and were qualitatively analyzed within 48 hours. Post-therapy evaluation was carried out when the wound area decreased >50%. Logistic regression tests were used for the analysis.	8–13.5 Days	After MDT, there is a decrease in the number of major pathogenic bacteria (including P. aeruginosa) and an increase in Proteus spp. Logistic regression tests showed a significant decrease in P. aeruginosa (OR=0.25; CI 0.08–0.58; $p<0.0001$), indicates the effectiveness of MDT microbiologically.

Yes	Author, Year	Place	Design Research	Purpose	Sample	Research instruments	Healing duration	Results
4.	Exploring the Effects of Lucilia sericata Maggote on Biofilm-forming Bacteria in Wounds (Egriebel et al., 2022)	Istanbul University-Cerrahpaşa, Traditional and Complementary Medicine Research and Application Center, Wound Healing Unit, Turkey	*True Experimental*	Examining the effect of the maggot *Lucilia sericata* on biofilm-forming bacteria in chronic wounds.	30 People	Wound swab cultures were carried out before and after MDT using Blood agar, Chocolate agar, and MacConkey agar media. Biofilm identification was carried out with Congo Red agar, and antibiotic sensitivity tests followed EUCAST standards.	4–6 days	Biofilm is found in 70% of patients and is successfully eliminated after 2–3 sessions of MDT. There is a decrease in the number of colonies as well as changes in the composition of bacteria after therapy. Studies show that larvae are able to destroy biofilms from resistant bacteria quickly and effectively ($p<0.05$ for biofilm reduction after 2–3 sessions).
5.	Lucillia Sericata maggotl therapy in the treatment of diabetic chronic wounds (Jafari et al., 2022)	This research was conducted in Iran.	RCT	Testing the effectiveness of maggot therapy in healing diabetic wounds and comparing it with conventional treatment methods.	80 People	The parameters measured included wound size, erythrocyte precipitation rate (ESR), and infection rate. Statistical analysis was carried out using an independent t-test and paired with SPSS version 18.	60 days	MDT significantly reduced wound size (38.5 ± 36.6 cm to 5.0 ± 6.6 cm) and ESR (57.3 ± 18.3 to 15.8 ± 4.8) at 60 days, with better outcomes than conventional debridement ($p < 0.001$).
6.	Maggot therapy vs conventional silver dressings for full-thickness burns: a randomized controlled trial (Gaffari et al., 2023)	Shahid Motahari Burns Hospital, Tehran, Iran	RCT	Evaluate MDT compared to *silver dressings* treatment in treating *full-thickness burns*.	31 People	Lesions were assessed clinically and through digital documentation (days 0, 2, 4, 6) using ImageJ. Statistical analysis using t-test was carried out with Prisma 8.1 and STATA 14.	10 -13.7 Days	Maggot therapy significantly accelerated the decrease in necrosis on day 2 ($p = 0.028$) and 4th ($p = 0.023$), as well as improved granulation ($p < 0.001$) compared to controls.

DISCUSSION

A wound is a loss of tissue continuity due to tissue loss or damage due to trauma or surgery. Lesions can occur on the surface of the mucosa as well as organ tissues, involving the skin to subcutaneous tissues, muscles, bones, and surrounding structures such as blood vessels, nerves, and tendons. The cause of the injury can be an accident, an intentional act (such as surgery), or a disease process. Intentional wounds are therapeutic, while unintentional wounds occur unintentionally.(Firdaus et al., 2020; Naziyah et al., 2022)

Injuries can be caused by a variety of factors, such as injury, surgery, pressure, friction, mechanical trauma (weapons, sharp/blunt objects), physical exposure (heat, cold, electricity), chemicals (bases/acids), and diseases such as diabetes or vascular disorders. Wounds are classified as chronic wounds (such as pressure ulcers and diabetic foot ulcers) and acute wounds (such as burns and surgical wounds). Although they have a big impact, injuries are often unnoticed by patients, families, and health care systems (Kindang et al., 2024; Mustamu et al., 2020) .

Wound care is one of the techniques in controlling infection in wounds because infection can hinder the wound healing process. Depending on how wound care is managed, whether or not it is done optimally, the healing process can take longer or perhaps faster than expected. In addition, untreated open wounds can also become infected. (Kindang et al., 2024) (Nur Asyifa et al., 2023) Wound healing is divided into three types. Primary healing occurs in clean wounds without tissue loss, such as surgical incisions, with the edges of the wound that can be joined together. Secondary healing occurs if there is tissue loss, so it is necessary to form granulated tissue from the base of the wound. Tertiary healing or delayed healing usually involves infection and requires manual wound closure once the infection is under control. Based on their duration, wounds are divided into acute if they heal in 2–3 weeks and chronic if they do not heal in 4–6 weeks (Mustamu et al., 2020).

Healing of soft tissue wounds, whether from trauma, chronic ulcers, or surgery, follows the same biochemical and cellular mechanisms. This process consists of four overlapping phases, the inflammatory phase (hemostasis and migration of immune cells), the destructive phase (cleansing of necrotic tissues by macrophages and netrophphiles), the proliferation phase (the formation of blood vessels and connective tissue), and the maturation phase (tissue reorganization, wound contraction, and re-epithelialization). The duration of healing depends on various factors that affect the duration of each phase. (Ariningrum & Subandono, 2023; Primadina et al., 2019)

Maggot therapy, often known as biotherapy that is, treatment with living things is one of the treatments that can be used for the wound healing process. Today, various maggot therapy techniques are used to clean and heal wounds successfully. Maggot therapy, also known as maggot therapy, is one of the treatment options for chronic, infected, necrotic, and flaccid wounds. Maggot are made from aseptically raised green bottle fly maggot (Lucilia sericata) that has specialist therapeutic qualities. (Harahap et al., 2024) (Nursing Times, 2021)

Maggots are effective in healing difficult wounds because they are able to break down necrotic tissue without damaging healthy tissue. They release proteolytic enzymes to dilute dead tissue which is then digested. Maggot therapy, especially when combined with other therapies, can synergistically accelerate healing. The benefits include a reduction in the frequency of surgical debridement, the risk of infection, the use of antibiotics, and the number and frequency of clinical visits are particularly beneficial for patients with complex conditions. (Jakucs, 2023)

Various studies have shown that therapeutic maggots are effective in removing dead tissue without damaging

healthy tissue, thus accelerating wound healing. Maggot also produces antibacterial compounds that are able to fight resistant bacteria such as MRSA, lowering the risk of infection. This process is known as "accelerated tissue regeneration" and is considered faster than traditional wound healing methods (Unairnews, 2025) .

Based on the results *of reviews* from 6 (six) research journals, it was found that maggot therapy showed significant effectiveness in accelerating the wound healing process, especially in cases of chronic wounds such as diabetic foot ulcer (DFU).

These results are also supported by; Egribel et al., (2022) showed similar results in terms of the effectiveness of larval therapy in chronically infected wounds. Nezakati noted a significant increase in wound healing and a significant decrease in necrotic tissue at the end of the second and third weeks of therapy ($p=0.041$ at week 2 and $p=0.012$ at week 3). Meanwhile, Egribel found that the biofilm layer on the wound was successfully removed within two to three sessions of larval therapy, which is equivalent to about 4–6 days. The study also showed that the larvae are able to destroy biofilms from resistant bacteria such as Nezakati et al., (2020) *S. aureus* and *P. aeruginosa* quickly and effectively ($p<0.05$ for biofilm reduction after 2–3 sessions).

Szczepanowski et al., (2021), shows that the larval application *L. sericata* significantly alters the wound microflora, with a decrease in the presence of pathogenic bacteria such as *S. aureus*, *P. aeruginosa*and *Streptococcus coagulase negative* after 8–13.5 days of therapy. Although not all detailed statistical results data are included, changes in microflora and therapeutic success showed significant p-values in some microbiological parameters, such as the reduction of certain pathogen species by $p<0.05$, especially in the group with a higher larval density (10 larvae/cm^2).

Siavash et al., (2020) specifically examined cases of atypical DFU that did not improve with standard treatment. As a result, 83.3% of patients experienced complete healing in an average time of 1.79 ± 0.8 months (about 54 days). The reduction in wound size and the increase in granulated tissue were statistically significant, with values of $p=0.001$ for a decrease in wound size and $p=0.002$ for increased granulated tissue, indicating high therapeutic effectiveness. Most patients show a positive response after five sessions of therapy, and this therapy has also been shown to prevent amputation in severe cases.

Research by reported that within 60 days, the size of the wound was drastically reduced from 38.5 cm^2 to 5 cm^2. In addition, there was a significant decrease in systemic inflammatory parameters such as blood precipitation rate (ESR), with $p=0.001$. This reinforces the findings that larval therapy is effective in accelerating wound healing as well as lowering inflammation without damaging healthy tissue. comparing conventional larval and silver dressing therapy in third-degree burns. The results showed that the debuncing time in the larval therapy group was significantly faster (10 days vs 13.7 days in the control group) with $p<0.001$. In addition, the comparison of tissue granulation on days 2, 4, and 6 showed a 5x (five-fold), 15x (fifteen-fold), and 13x (thirteen-fold) increase in the larval therapy group compared to the control group, also with a $p<0.001$.maggot therapy was more selective and reduced the risk of loss of healthy tissue, thereby accelerating the formation of new granulated tissue. Maggot therapy is a safe, effective, economical, and superior method in accelerating wound healing compared to conventional surgical methods (Jafari et al., 2022 ; Gaffari et al., 2023).

From the data analysis of the six articles, the average effective time of maggot therapy in having a positive impact on wounds is about 1-2 months (30-60 days). Combined, the results of these six trials provide more evidence that maggot therapy is a viable alternative technique to speed up the healing of chronic wounds, lower the risk of infection, and maintain healthy tissue

integrity. The way the larvae selectively feed on necrotic tissue, its antibacterial effect against resistant pathogens, as well as its ability to stimulate the formation of granulated tissue and improve wound microflora, are closely related to the efficacy of this therapy.

CONCLUSIONS

Maggot therapy effectively accelerates the healing of chronic wounds through selective debridement, antimicrobial effects, and stimulation of tissue regeneration. A review of 6 (six) studies shows that this therapy reduces pathogenic bacteria, accelerates the formation of granulated tissue, and reduces the size and inflammation of wounds without damaging healthy tissues, the healing process required is 1-2 months (30-60 days). Maggot therapy also reduces the need for antibiotics and the risk of infection, making it a safe, effective, and cost-effective alternative.

REFERENCES

Ariningrum, D., & Subandono, J. (2023). A Manual of Wound Management. *Faculty of Medicine, Sebelas Maret University, Surakarta*, 1–74.

Egriebel, M., Sirekbasan, S., Çakan, H., & Polat, E. (2022). Exploring the Effects of Lucilia sericata Maggote on Biofilm-forming Bacteria in Wounds. *Dicle Tıp Dergisi*, *49*(4), 565–570. https://doi.org/10.5798/dicletip.1220738

Firdaus, N. Z., Alda, A. A., & Gunawan, I. S. (2020). The Potential of Grape Seed Content in Accelerating Wound Healing. *Journal of Professional Nursing Research*, *2*(2), 139–146. https://doi.org/10.37287/jppp.v2i2.85

Gaffari, J., Akbarzadeh, K., Baniardalani, M., Hosseini, R., Masoumi, S., Amiri, Z. S., Shabani Kordshouli, R., Rafinejad, J., & Dahmardehei, M. (2023). Maggotl therapy vs conventional silver dressings for full-thickness burns: a randomized controlled trial. *BMC Medicine*, *21*(1), 1–13. https://doi.org/10.1186/s12916-023-03063-7

Harahap, S., Sirait, S. F. D., & Tarigan, M. (2024). *Effectiveness of Maggot Therapy in the Debridement Stage in Diabetic Leg Wounds: A Systematic Review*. *5*, 3420–3425.

Jafari, A., Hosseini, S. V., Hemmat, H. J., & Khazraei, H. (2022). Lucillia Sericata maggotl therapy in the treatment of diabetic chronic wounds. *Journal of Diabetes and Metabolic Disorders*, *21*(1), 305–312. https://doi.org/10.1007/s40200-022-00973-w

Jakucs, C. (2023). *A Deeper Look at Maggot Therapy in Wound Care*. Wound Care Education Institute.

Kindang, I. W., Paundanan, M., Mahmud, M. R., Asiah, N., Lasanuda, N. D., Anisa, N., Umabaihi, N., Revalina, Pratiwi, S. D., Manto, S. S., & Pasau, S. A. (2024). Counseling and Simulation of Simple Wound Care to the Bukit Sari Community. *Community Development Journal*, *5*(3), 5008–5011.

Malekian, A., Esmaeeli Djavid, G., Akbarzadeh, K., Soltandallal, M., Rassi, Y., Rafinejad, J., Rahimi Foroushani, A., Farhoud, A. R., Bakhtiary, R., & Totonchi, M. (2019). Efficacy of Maggot Therapy on Staphylococcus aureus and Pseudomonas aeruginosa in Diabetic Foot Ulcers: A Randomized Controlled Trial. *Journal of Wound, Ostomy and Continence Nursing*, *46*(1), 25–29. https://doi.org/10.1097/WON.0000000000000496

Munandar, A. (2022). *Wound care and complementary therapy* (issue may).

Mustamu, A. C., Mustamu, H. L., & Hasim, N. H. (2020). Increased knowledge & skills in treating wounds. *Journal of Community Service Sasambo*, *1*(2), 103. https://doi.org/10.32807/jpms.v1i2.483

Naziyah, N., Hidayat, R., & Maulidya, M. (2022). Latest Wound Management Counseling in the Covid-19 Pandemic

Situation Through Wound Islamic Boarding School Activities Using Zoom Meeting Media for Students of the Nursing & Nurse Profession Study Program, Faculty of Health Sciences, National University of Jakarta. *Journal of Community Service Creativity (PKM), 5*(7), 2061–2070. https://doi.org/10.33024/jkpm.v5i7.6223

Nezakati, E., Hasani, M. H., Zolfaghari, P., Rashidan, M., & Sohrabi, M. B. (2020). Effects of Lucilia sericata Maggot Therapy in Chronic Wound Treatment: A Randomized Clinical Trial. *Chronic Wound Care Management and Research*, *Volume 7*, 11–17. https://doi.org/10.2147/cwcmr.s248149

Nur Asyifa, T., Mustofa, S., Ismunandar, H., & Trijayanthi Utama, W. (2023). Ways To Speed Up Wound Healing. *Winda Trijayanthi Utama | Ways to Speed Up Spinal Cord Wound Healing |*, *12*, 659–666.

Nursing Times. (2021). The principles of maggot therapy and its role in contemporary wound care. Nursing Times.

Primadina, N., Basori, A., & Perdanakusuma, David. S. (2019). The wound healing process is reviewed from the aspect of cellular mechanisms. Medical Journal, 3(1), 31–43.

Siavash, M., Najjarnezhad, A., Mohseni, N., Abtahi, S. M., Karimy, A., & Sabzevari, M. H. (2020). Efficacy of Maggot Debridement Therapy on Refractory Atypical Diabetic Foot Ulcers: An Open-Label Study. International Journal of Lower Extremity Wounds, 20(4), 315–320. https://doi.org/10.1177/1534734620920403

Sukma Arda, et al. (2025). Increasing Knowledge About the Wound Healing Process at the Internal Medicine Clinic of Dr. Moewardi Hospital Surakarta. 4(1), 1005–1013.

Thank you. (2023). Wound care with modern dressing. Publisher Wound UK, 01(03), 1–177.

Szczepanowski, Z., Grabarek, B. O., Boroń, D., Tukiendorf, A., Kulik-Parobczy, I., & Miszczyk, L. (2022). Microbiological effects in patients with leg ulcers and diabetic foot treated with Lucilia sericata maggote. International Wound Journal, 19(1), 135–143. https://doi.org/10.1111/iwj.13605

Unairnews. (2025). Maggot Therapy: Innovation in Diabetic Wound Healing. Airlangga University.

Harahap, S., Sirait, S. F. D., & Tarigan, M. (2024). *Effectiveness of Maggot Therapy in the Debridement Stage in Diabetic Leg Wounds: Systematic Review*. *5*, 3420–3425.