RESEARCH PAPER

Effectiveness of Rice Flour with Honey on Cracked Heels among Farmers in Sangli, India: A Quasi-Experimental Study

Mrs. Snehalata Reddy[1], Dr. Vijaya Kumbhar[2] , Ms. Jesica Mali[3] , Mrs. Sindu Gaikwad[4], Dr. Dhanraj Babu[5] , Mr.Gourav Soundade,[6] Ms. Minakshi Chinninty,[7] Mr. Vaibhav Ranbhise[8]

Dept of community health nursing, Dept of Obstetric Gyanacology nursing , Dept of Medical Surgical nursing , Dept of Paediatric Nursing Bharati Vidyapeeth (Deemed to be University), College of Nursing, Sangli,

Corresponding Author – Mrs, Snehalata S.Reddy

Email id- snehalata.waghmare@bharatividyapeeth.edu

Abstract:

Background: "Cracked heels are a common yet often neglected foot problem among farmers, causing discomfort, pain, and risk of infection, particularly in rural populations exposed to harsh environmental conditions. This study aimed to evaluate the effectiveness of a natural remedy—rice flour mixed with honey—in reducing the severity of cracked heels among farmers **Objective**: To assess the severity of cracked heels before the application of rice flour with honey in both the experimental and control groups. To evaluate the effectiveness of rice flour with honey after its application in the experimental group. To compare the post-test scores of cracked heel severity between the experimental and control groups**. Results:**The experimental group showed better improvement, with 30% achieving complete healing compared to 20% in the control group. The mean post-test score was lower in the experimental group (M = 1.15 ± 1.01) than in the control group (M = 1.80 ± 1.23), with a statistically significant difference (t = −2.59, p = 0.011).**Conclusion:**Rice flour with honey was found to be an effective and low-cost remedy for cracked heels, and it can be recommended for rural health promotion.

Keywords: Cracked heels, Rice flour, Honey, Farmers

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Introduction

Prevention is better than cure" underscores the importance of early and simple interventions to avoid more serious health problems. Cracked heels are a common yet often neglected condition, particularly among farmers who spend long hours standing and working in harsh environments.[1] Contributing factors include prolonged weight-bearing, exposure to dust and mud, and inadequate foot care. Although the plantar skin is thick and viscoelastic—designed to withstand pressure and friction—neglect and dryness can result in painful fissures, often accompanied by callus formation and yellow or dark-brown discoloration. These cracks may cause discomfort, bleeding, infections, and limitations in daily activities, affecting overall quality of life.[2] Natural remedies, such as rice flour combined with honey, offer an accessible and cost-effective approach due to their exfoliating and healing properties. This study aims to evaluate the effectiveness of this traditional remedy in reducing the severity of cracked heels among farmers in selected areas[3]

Materials Methods:

A quasi-experimental design was used to assess the effectiveness of a rice flour and honey mixture in reducing cracked heel severity. Eighty participants were selected through non-probability purposive sampling and randomly assigned to experimental (n = 40) and control (n = 40) groups. The experimental group applied the rice flour–honey mixture once daily for 8 days, while the control group received no intervention. Data were collected using a structured checklist and a severity grading scale, both validated by 21 experts in relevant fields, with modifications incorporated to ensure content validity. Reliability was confirmed using the test-retest method, yielding a high coefficient

of r = 0.97. Pre- and post-intervention assessments were conducted for both groups. Statistical analysis was performed using descriptive statistics and independent t-tests to evaluate the intervention's effectiveness.

Statistical analysis:

Section I:

Analysis of the demographic characteristics of the study participants.

Section II:

Analysis of cracked heel severity before and after the application of rice flour with honey in both experimental and control groups.

Section III:

Comparison of post-test scores between the experimental and control groups.

Results

Table-1: Distribution of socio demographic variables of farmers

Sr. No.	Demographic Variables		Experimental Group		Control Group	
			Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1.	Age in years	21-30	4	10%	3	7.5%
		31-40	11	27.5 %	10	25%
		41-50	13	32.5 %	16	40%
		51-60	12	30%	11	27.5 %
2.	Gender	Male	16	40%	12	30%
		Female	24	60%	28	70%
3.	Education	Primary school	9	22.5 %	8	20%
		Secondary school	14	35%	13	32.5 %
		SSC	6	15%	7	17.5 %
		HSC	7	17.5 %	9	22.5 %
		UG	4	10%	3	7.5%
4.	FamilyIncome	5000-10000	10	25%	12	30%
		10001-15000	8	20%	10	25%
		15001-20000	10	25%	8	20%
		20001 and above	12	30%	10	25%
5.	Have you received any treatment(Home remedies)	Yes	0	0%	0	0%
		No	40	100%	40	100%

Tableno.2: Distribution of level of cracked heels before intervention in experimental and control group.

Observation	Level	Experimental Group		Control Group	
		Day 1		Day 1	
		F	%	F	%
Level of cracked heel on feet	clear	0	0%	0	0%
	Mild	20	50%	16	40%
	Mod	12	30%	10	25 %
	Severe	5	12.5%	11	27.5 %
	Very Severe	3	7.5 %	3	7.5 %

The data in Table 2 present the distribution of cracked heel severity before intervention (Day 1) in both experimental and control groups. No participants in either group had completely healthy heels, as the "no crack" category recorded 0 (0%) in both groups. In the experimental group, the majority of participants (50%) had mild cracked heels, compared to 40% in the control group, indicating relatively better baseline condition. Moderate cases were observed in 30% of the experimental group and 25% of the control group, showing a similar distribution. However, severe cases were higher in the control group (27.5%) compared to the experimental group (12.5%), suggesting more advanced heel damage among control participants. Very severe cases were equally distributed in both groups (7.5%). Overall, the experimental group demonstrated a slightly

better baseline condition, with a higher proportion of mild cases and fewer severe cases compared to the control group. These baseline differences should be considered while interpreting post-intervention outcomes.

Table no. 3: Distribution of level of cracked heels after intervention in experimental and control group.

Observation	Level	Experimental Group		Control Group	
		Day 8		Day 8	
		F	%	F	%
Level of cracked heel on feet	clear	12	30%	0	0%
	Mild	15	37.5 %	16	40%
	Moderate	9	22.5 %	10	25 %
	Severe	3	7.5 %	11	27.5 %
	Very Severe	1	2.5 %	3	7.5 %

Table 3 shows the distribution of cracked heel severity on Day 8 after the intervention in both groups. In the experimental group, 30% of participants had no visible cracks indicating greater complete healing. Mild cases were also higher in the experimental group (37.5%) than in the control group (40%), suggesting improvement from more severe conditions. Moderate cases were slightly lower in the experimental group (22.5%) compared to the control group (25%). Severe cases were notably higher in the control group (27.5%) than in the experimental group (7.5%), reflecting a significant reduction in severity following the intervention. Similarly, very severe cases were fewer in the experimental group (2.5%) compared to the control group (7.5%). Overall, the experimental group demonstrated better improvement in cracked heel severity after the intervention.

Table no.4: Significance difference between post-tests core in relation to level of cracked heels after intervention

n=40

Sr no	Post-Test 8th Day	Mean	N	Std. Deviation	't' Value	Df	'p' value.	Result
1.	Experimental Group.	1.15	40	1.01	-2.59	78	0.011	0.05
2.	Control Group.	1.80	40	1.23				

An independent t-test showed that the post-test mean score of cracked heel severity was lower in the experimental group (M = 1.15, SD = 1.01) than in the control group (M = 1.80, SD = 1.23). The difference was statistically significant (t = −2.59, df = 78, p = 0.011).

Discussion

This study evaluated the effectiveness of a natural intervention—rice flour combined with honey—in reducing cracked heels among farmers. The findings are discussed in relation to demographic variables, baseline assessment, post-intervention outcomes, and statistical significance.

The demographic profile indicated that the majority of participants in both experimental and control groups were aged 41–50 years, followed by 51–60 years. This suggests that middle-aged farmers are particularly vulnerable to cracked heels, likely due to prolonged standing, exposure to harsh environmental conditions, and inadequate foot care. A higher proportion of females were affected in both groups, which may be attributed to their combined roles in agricultural labor and household responsibilities. These findings are consistent with previous research (Desai et al., 2023), which reported a higher prevalence of heel fissures among women due to dryness and insufficient self-care practices. Additionally, most participants had secondary education and belonged to low- to middle-income groups, indicating limited access to healthcare resources and preventive measures. The absence of prior treatment among all participants ensured homogeneity at baseline.

Baseline (pre-test) assessment revealed that none of the participants had completely healthy heels,

confirming the high prevalence of this condition among farmers. Mild and moderate cases were predominant in the experimental group, whereas the control group exhibited a relatively higher proportion of severe cases. Although both groups were comparable overall, the slightly better baseline condition in the experimental group should be considered when interpreting the results. Similar observations were reported by Zanwar and Wajpeyi (2021), who emphasized the importance of assessing initial severity for accurate evaluation of treatment outcomes.

Following the intervention, the experimental group demonstrated marked improvement compared to the control group. A substantial proportion of participants in the experimental group achieved complete healing, and many others showed reduction to mild severity levels. In contrast, the control group continued to exhibit higher levels of moderate to severe cracked heels. The observed improvement may be attributed to the combined effects of rice flour and honey. Rice flour likely acts as a mild exfoliating agent, facilitating removal of dead skin cells, while honey provides moisturizing, antimicrobial, and wound-healing properties. These findings align with Rathinamoorthy and Keerthana (2021), who reported beneficial effects of natural agents such as banana peel extract on skin hydration and healing. Similarly, Raju Meena et al. (2021) demonstrated the effectiveness of herbal ointments in reducing fissures and associated symptoms, supporting the role of natural remedies in managing cracked heels.

The statistical analysis further confirmed the effectiveness of the intervention. The independent t-test showed a significant difference between the experimental and control groups ($t = -2.59$, $p = 0.011$), indicating that the reduction in cracked heel severity in the experimental group was not due to chance. The lower mean post-test score in the experimental group compared to the control group supports this conclusion. These findings are comparable to those reported by Gupta and Acharya (2018), who observed statistically significant improvements in symptoms such as dryness, pain, and itching following the use of herbal formulations. In summary, the findings of the present study demonstrate that rice flour with honey is an effective, low-cost, and easily accessible intervention for managing cracked heels among farmers. The results highlight the potential of natural remedies in improving foot health, particularly in rural and resource-limited settings. Promoting such simple interventions can contribute to better self-care practices and overall well-being in vulnerable populations.

Conclusion

The findings of the present study demonstrate that the application of rice flour with honey is an effective intervention in reducing the severity of cracked heels among farmers. Participants in the experimental group showed significant improvement in heel condition compared to those in the control group, as evidenced by lower post-test severity scores and a higher proportion of complete healing.

The statistical analysis further confirmed the effectiveness of the intervention, with a significant difference observed between the two groups. This indicates that the improvement was attributable to the treatment rather than chance. The combination of rice flour and honey, with its exfoliating, moisturizing, and healing properties, proved to be a simple yet beneficial remedy.

Given its low cost, easy availability, and non-invasive nature, this intervention can be recommended as a practical self-care measure for farmers and other populations at risk of developing cracked heels, particularly in rural and resource-limited settings. The study highlights the importance of promoting natural and accessible healthcare practices to improve foot health and overall quality of life.

Further studies with larger sample sizes and longer follow-up periods are recommended to validate and generalize these findings.

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References

Nepanikar SU. Evaluation of efficacy and safety of Amarantha footcare cream in subjects suffering from cracked heels (xerosis of the feet):

A randomized, open-labeled, multicentric, comparative, interventional, prospective clinical study. *J Indian Syst Med*. 2023.

 Weerasekera KR. Indigenous medicine intervention in the management of Padadari (cracked heel): A case study. *Int J AYUSH Case Rep*. 2023;7(3):257.

 Wadekar PH. Department of Pharmaceutics, Jayawantrao Sawant College of Pharmacy and Research, Hadapsar, India.

 Moharkar DW. Development and evaluation of aloe vera gel-loaded crack cream. *Iconic Res Eng J*. 2022;6(6):88.

 Sivakumar M, Sivapriya N, Chacko T. Prevalence and correlates of fissure foot in a rural area in Tamil Nadu. *Indian J Dermatol Venereol Leprol*. 1999;65:26–27.

 Sankhe K. Department of Dermatology, Venereology and Leprosy, Terna Medical College & Terna Speciality Hospital and Research Centre, India.

 Lande AD. Development and evaluation of aloe vera gel-loaded crack cream. *Iconic Res Eng J*. 2022;6(6):88.

 Polit DF, Beck CT. *Nursing research: Generating and assessing evidence for nursing practice*. 11th ed. Philadelphia: Wolters Kluwer; 2021.

 IYTMed. How common are cracked heels? [Internet]. [cited 2025 May 2]. Available from: https://iytmed.com/cracked-heels/

 Kapilraj R, Venkatesh Kumar S, Solankey RD, Umar ICP. Modifiable risk factors associated with heel pain in Indian population – An observational study. *J Chem Health Risks*. 2024;14(3):3094–3101.

 Petkar S, Waghmare P, Sankhe K, Maheshawari P. Study of fissure soles: Prevalence and their association with various dermatoses. *J Pharm Res Int*. 2021;33(64B):226–230.

 Landge GS, Salunkhe P. Prevalence of heel pain in farmers. *Indian J Public Health Res Dev*. 2020;11(6).