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COMMUNITY-BASED STRATEGIES FOR THE PREVENTION AND CONTROL OF COMMUNICABLE SKIN DISEASES

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Abstract:
Cutaneous infectious diseases, such as scabies, impetigo, and fungal infections, represent a significant public health issue, particularly in resource-limited and highly populated communities. These illnesses are primarily driven by compromised hygiene practices, limited access to care, and poor health knowledge. To evaluate the effectiveness of an intervention programme that targeted and involved the community to prevent and control recurrent communicable skin disease. A cross-sectional study of 77 patients with a contagious skin condition was performed. The intervention consisted of three components: (1) structured health education on disease transmission and prevention, (2) the provision of hygiene kits containing soap, towels, and nail clippers, and (3) the application of topical medication with follow-up visits. Clinical outcomes and self-reported hygiene behaviors were assessed at 12-month follow-up. The three most common diagnoses were impetigo (32.5%), scabies (28.6%), and tinea infections (23.4%). 63.6% of participants had poor handwashing hygiene following contact, and 49.4% had sharing towels or bedding at baseline. At follow-up (n=73), there was a 89.0% rate of clinical improvement or resolution with the intervention. Further, extreme self-reported change in key hygiene practices was observed, including a 79.5% boost in washing one's hands often and an 84.9% reduction in sharing potentially dirty items. Intervention was 97.3% satisfactory to participants. A community-based package that integrates health education, distribution of basic hygiene supplies, and personal CHW follow-up is highly effective and acceptable for prevention and control of communicable skin diseases. The model draws on both structural and behavioral determinants of health and is an ideal strategy for stemming the burden of these diseases among disadvantaged populations.

Keywords: Communicable Skin Diseases, Scabies, Impetigo, Health Education, Disease Prevention, Public Health, Hygiene

Introduction

Communicable skin diseases are a widespread and often unappreciated danger to international public health, but one that is most worrisome for the world's most disadvantaged populations [1]. These

infections, from bacterial impetigo and parasitic scabies to fungal dermatophytoses, are more than a nuisance; they are a leading cause of morbidity, social exclusion, and economic burden [2]. Unlike systemic illness, their obvious presentation usually leads to stigmatization, social rejection, and severe psychologic torment, overlying the physical woe of pruritus and pain [3]. The World Health Organization and all major epidemiologic studies have consistently underlined the endemicity of these diseases where there exists poverty, crowding, and inadequate access to clean water and sanitation [4]. While both preventable and treatable, their persistence points to a fundamental breakdown in public health delivery systems for the most part in reaching marginalized populations where clinic-based care is absent, unaffordable, or not acceptable [5]. It is against this background that community-based methods emerge not as an alternative, but as a model required for the effective prevention and control of communicable skin diseases [6].

The major agents—Staphylococcus aureus and Streptococcus pyogenes for impetigo, Sarcoptes scabiei mite for scabies, and dermatophyte genera for tinea—grow in specific host and environmental conditions [7]. The high population density living conditions of urban slums, refugee camps, and impoverished households are risk factors for direct skin-to-skin contact necessary to transmit scabies or indirect transmission via fomites like shared towels, bedding, and clothing [8]. Adequate water and soap to wash with are also lacking, which creates a favorable environment for bacterial superinfection of small cuts and scratches, bites by insects, or initial dermatoses like scabies, leading to more severe complications such as cellulitis, lymphangitis, and even post-streptococcal glomerulonephritis [9]. The host factors are no less significant; children, by virtue of their immature immune status and predilection to be in close contact in schools and playgrounds, are most severely the affected group, being reservoirs of community transmission [10].

Community-based interventions are this turning point. They are founded on the belief of decentralization of healthcare through the utilization of local resources, most important being community health workers (CHWs) [11]. CHWs, by virtue of being such members of the communities they serve whom the community trusts, can bridge efficiently the gap between the official health system and the people [12]. Their roles can be multifaceted: active case-finding via house-to-house visits, providing culturally and linguistically tailored systematic health education, direct observation of treatment to enhance adherence, and dispensing simple but critical prevention tools like hygiene kits containing soap and nail clippers [13]. Such a pattern of task-shifting has proven effective in managing other leading public health priorities, such as tuberculosis and malaria, and holds great potential for dermatologic conditions. Targeted medicines such as ivermectin in scabies or mupirocin in impetigo have been shown by different studies to be effective [14]. Also, the measurable effects of such interventions are most likely to revolve around clinical cure rates, though equally significant outcomes, such as effects on KAP concerning hygiene, acceptability of intervention, and long-term behavior change sustainability, were less often reported [15].

Materials and Method

Study Design and Setting

A cross-sectional study design with a pre- and post-intervention analysis was conducted through a community-based interventional study over a period of 12 months from January 2024 to January 2025. The study setting was conducted in hospitals in Baghdad, Iraq, hospitals. The setting was selected by purposive sampling due to its reported high population, crowded living conditions, and a risk-exposed environment to communicable skin diseases. Written informed consent was obtained from all adult participants, and parents or guardians gave consent for all children, with assent obtained from children aged more than seven years.

Study Population and Sampling

The study population included individuals of all ages with a suspected communicable skin disease identified through a community-wide screening campaign. Trained diagnosticians to recognize the

cardinal signs of common skin infections (i.e., pustules, burrows, scaling, papules), and conducted active case-finding through door-to-door visits in predefined clusters of the settlement. All the eligible individuals identified during the screening period and meeting the inclusion criteria were invited to participate. Eligibility criteria included: 1) clinical diagnosis of an infectious skin infection (i.e., impetigo, scabies, tinea, bacterial folliculitis) by the study physician; 2) residence in the target community for at least the past three months; and 3) consent to participate in the intervention and follow-up. Exclusion criteria included: 1) known allergy to any of the interventional medications; 2) severe systemic illness requiring immediate hospital referral; and 3) skin conditions deemed non-communicable (e.g., eczema, psoriasis). A total of 77 participants were enrolled, forming the final study cohort.

Data Collection and Baseline Assessment

Data collection was performed using a structured, pre-tested questionnaire administered by trained Diagnosers trained in the local dialect. Baseline data collected included:

a. Socio–demographic variables: Sex, age, household size, number of rooms, and primary water source.

b. Clinical variables: Primary skin diagnosis as verified by the study physician, secondary bacterial infection as evidenced by the presence of pustules, yellow crusting, or weeping erythema over a primary lesion, and duration of symptoms.

c. Hygiene Practices: Frequency of bathing as reported by participants, handwashing frequency after contacting lesions or an infected person, and towel, clothing, or bedding sharing.

d. Health-seeking behavior: Activity undertaken prior to the study intervention (e.g., clinic visit, pharmacy purchase, traditional remedy).

The Intervention: A Multi-Component Strategy

All participants recruited were provided a packaged, multi-faceted intervention designed to target the essential pillars of disease transmission: agent, host, and environment.

A. Health Education Session: A standardized, one-on-one, or small-group education session was provided to all patients and/or primary caregivers by a CHW. In this session, lasting approximately 15-20 minutes, visual aids helped explain the nature of their own skin disease, its mode of transmission, and the extreme importance of treatment completion. Key messages emphasized frequent handwashing with soap, the need not to scratch, the total prohibition of sharing personal items (towels, clothes, combs), and the contribution of environmental measures.

B. Standardized Treatment Provision: Based on the clinical diagnosis, a standard treatment regimen was provided free, based on WHO and international guidelines.

a. Impetigo/Bacterial Infection: 2% Mupirocin ointment topically three times daily for 7 days. For widespread cases, oral antibiotics (e.g., Cephalexin) were given.

b. Scabies: 5% Permethrin cream was applied from the neck down, left on for 14 hours, and then washed off. The treatment was repeated after one week. All members of the household were advised to be treated simultaneously to prevent reinfestation.

c. Tinea Infections: Topical 1% Clotrimazole cream twice daily for a minimum of 4 weeks.

C. Distribution of Hygiene Kits: To enable the behavioral changes encouraged during the education session, all the participants were given a hygiene kit containing a bar of antiseptic (e.g., chlorhexidine) soap, a personal towel, a nail clipper, and a leaflet outlining the key educational messages.

D. Community Health Worker Follow-up: Active follow-up was a cornerstone of the intervention. CHWs performed home visits 48-72 hours after enrollment to monitor for any side effects and

reinforce technique and adherence. A final follow-up visit was conducted at 14 days (±2 days) after enrollment to determine the final outcome.

Outcome Measures and Follow-up Assessment

The primary outcome measure was clinical improvement at 14-day follow-up, as assessed by the same study physician if possible, or by a trained CHW using a standardized evaluation guide. Improvement was categorized as:

a. Resolved: Complete resolution of initial lesions.

b. Improved: Significant reduction in erythema, scaling, pustules, and/or pruritus.

c. Unchanged: No alteration from baseline.

d. Worsened: Lesion size increase, number increase, or signs of secondary infection.

Secondary outcome measures at the follow-up period included:

a. Change in Hygiene Practices: Assessed by a follow-up questionnaire documenting self-reported change in frequency of bathing, handwashing behavior, and sharing of personal items.

b. Knowledge Assessment: Participants were posed three simple questions to assess recall of key educational messages (disease contagion, named prevention methods, and importance of treatment completion).

c. Program Satisfaction: Assessed on a 5-point Likert scale from Very Satisfied to Very Dissatisfied.

Data Management and Statistical Analysis

The SPSS software version 24.0 was used to conduct statistical analysis. Baseline characteristics of the study population were summarized using descriptive statistics and presented in terms of frequencies and percentages for categorical data. The primary outcome (clinical improvement) was presented as a proportion with a 95% confidence interval. Self-reported hygiene behavior changes from baseline to follow-up were compared using McNemar's test for paired categorical data. To identify predictors of poor outcome (unchanged/worsened state), univariate logistic regression analysis was performed, which estimated odds ratios (OR) and 95% confidence intervals (CI) for overcrowding, presence of secondary infection, and non-adherence. The significance level was $p < 0.05$.

Results

Baseline traits of our sample (N=77) provide the classic epidemiological picture of a high-risk group for infectious skin illness. The skewing pattern among children and youth (52% under 18 years of age) is consistent with global scabies and impetigo data and correlates with behavioural and hygiene factors and immunological susceptibility. The extremely high overcrowding housing rate of 40.3% is particularly noteworthy, since it has always been an established promoter of parasitic and bacterial dermatoses transmission. This environmental factor is what offers the permissive climate in which casual contact easily transmits Sarcoptes scabiei or disease-producing Streptococcus and Staphylococcus species, see table 1.

Table 1. Demographic characteristics of the study population.

Characteristic	Category	Number (n)	Percentage (%)
Age Group	<5 years	18	23.4
	5 - 17 years	22	28.6
	18 - 45 years	28	36.4
	>45 years	9	11.7
Sex	Male	42	54.5

	Female	35	45.5
Living Conditions	Overcrowded (>3 persons/room)	31	40.3
	Not Overcrowded	46	59.7
Primary Water Source	Piped in-house	25	32.5
	Public tap/well	52	67.5

Table 2 shows the distribution of primary diagnoses among the participants. The most common conditions were impetigo, scabies, and tinea, which are the primary focus of the intervention.

Table 2. Distribution of primary diagnoses.

Diagnosis	Number (n)	Percentage (%)
Impetigo	25	32.5
Scabies	22	28.6
Tinea corporis/capitis (Ringworm)	18	23.4
Bacterial Folliculitis	7	9.1
Viral Warts	3	3.9
Molluscum Contagiosum	2	2.6

Furthermore, the hygiene practices reported as baseline for the study—with only 36.4% participants stating that they wash their hands after any contact, or with nearly half reporting sharing towels or bedding—go a long way into explaining the endemicity of these conditions. This data sets the status quo pre-intervention: a perfect storm of environmental risk and behavioural patterns conducive to perpetuating disease transmission. From the fact that 26.0% stated taking no action before the study, there then arise barriers to accessing formal healthcare, either in the way of finances, logistics, or culture.

Table 3 outlines the presence of secondary infections among participants, indicating that 37.7% of the participants had secondary bacterial infections, which is an important factor in the disease progression and intervention outcomes.

Table 3. Presence of secondary bacterial infection.

Condition	Number (n)	Percentage (%)
Secondary Infection Present	29	37.7
No Secondary Infection	48	62.3

Table 4 illustrates the baseline hygiene practices, with a significant number of participants reporting poor handwashing practices and frequent sharing of towels, which contributes to the spread of the infectious diseases targeted by the intervention.

Table 4. Reported hygiene practices at baseline.

Practice	Category	Number (n)	Percentage (%)
Bathing Frequency	≥ Once daily	45	58.4
	< Once daily	32	41.6
Handwashing after contact	Always/Often	28	36.4
	Sometimes/Never	49	63.6
Shares towels/bedding	Yes	38	49.4
	No	39	50.6

Table 5 summarizes the components of the intervention that participants received, including health education, hygiene kits, topical medications, and follow-up visits by community health workers.

Table 5. Intervention components received.

Intervention	Number (n)	Percentage (%)
Health Education Session	77	100.0
Hygiene Kit (Soap, towel, nail clipper)	65	84.4
Topical Medication Applied	77	100.0
Follow-up visit by Community Health Worker	70	90.9

The profound 89.0% resolution and improvement rate at follow-up brilliantly stands to show that these treatments given (permethrin, mupirocin) are very efficacious when this treatment adherence is supported. This is a critical point. The actual prescription of topical medication in similar communities may often be insufficient due to misunderstandings regarding its application, ceasing to use it once symptoms improve, or simply being unable to afford a full course of medication. Our model took a direct approach to these concerns. The self-reported improvements in hygiene practices might be considered just as important as the clinical improvements. The percentage of respondents reporting an increase in the frequency of handwashing was 79.5%, and 84.9% reported less sharing of towels and bedding. This is a profound change in community practices, giving hope that the health education was not just passively received but was actively translated into behavior. A major catalyst was probably the distribution of the hygiene kits, see Table 6.

Table 6. Clinical outcome at 2-week follow-up.

Outcome	Number (n)	Percentage (%)
Condition Improved	65	89.0
Condition Resolved	41	56.2
Condition Improved	24	32.9
Condition Unchanged/Worsened	8	11.0
No Change	5	6.8
Worsened	3	4.1

This table highlights the positive changes in hygiene practices following the intervention, with substantial increases in handwashing frequency and reductions in the sharing of towels and bedding, reflecting the success of the educational and behavioural components of the intervention (see Table 7).

Table 7. Change in Reported Hygiene Practices at Follow-Up.

Practice	Improvement	No Change	Worsened
Bathing Frequency	51 (69.9%)	20 (27.4%)	2 (2.7%)
Handwashing after contact	58 (79.5%)	14 (19.2%)	1 (1.4%)
Sharing towels/bedding	62 (84.9%)*	11 (15.1%)	0 (0.0%)

Non-adherence to medication being the most potent predictor of treatment failure (OR: 6.8), it is a strong validation of the CHW follow-up model, ensuring adherence is not an auxiliary activity but a proper determinant of success. On the contrary, overcrowding kept its shadows (OR: 4.1) even with some intervention. This is a serious sobering reminder of the limits of both individual and behavioural-level interventions. It creates the critical "glass ceiling:" No matter how effective the treatment and education are, sustained control will be complicated to attain without addressing the primary structural determinant of overcrowding in housing.

Table 8 shows the post-intervention knowledge assessment results, revealing that the majority of participants correctly identified key preventive methods and understood the importance of completing the treatment.

Table 8. Patient/caregiver knowledge assessment post-intervention.

Knowledge Question	Correct Responses (n)	Percentage (%)
Identifies disease as contagious	71	97.3
Can name ≥2 prevention methods	68	93.2
Understands the importance of treatment completion	65	89.0

This table 9 presents the factors associated with poor outcomes, including overcrowded living conditions, secondary infections, non-adherence to medication, and lack of follow-up visits by community health workers, which are critical for future program optimization.

Table 9. Univariate analysis of factors associated with lack of improvement.

Factors	Odds Ratio	95% Confidence Interval	p-value
Overcrowded living conditions	4.1	1.1 - 15.8	0.04
Presence of secondary infection at baseline	3.5	1.0 - 12.5	0.06
Non-adherence to the medication regimen	6.8	1.8 - 25.3	<0.01
Did not receive follow-up CHW visit	5.2	1.3 - 20.1	0.02

Finally, the extremely high satisfaction rate (97.3%) is a non-trivial outcome. It indicates that the intervention was not only effective but also acceptable and respectful from the community's perspective. The perceived benefit of feeling heard, supported, and equipped with solutions by a trusted local figure (the CHW) likely contributed greatly to this satisfaction and fosters a sense of community ownership, which is essential for the long-term sustainability of any public health initiative.

Table 10 shows the overall satisfaction of participants with the community-based program, with an overwhelmingly high satisfaction rate of 97.3%, which highlights the acceptability of the intervention within the community.

Table 10. Overall Satisfaction with Community-Based Program.

Satisfaction Level	Number (n)	Percentage (%)
Very Satisfied	58	79.5
Satisfied	13	17.8
Neutral	2	2.7
Dissatisfied	0	0.0
Very Dissatisfied	0	0.0

Discussion

This community-based intervention study is a prime example of the excellent efficacy of a multicomponent strategy in reducing the infectious skin disease burden in a resource-poor, at-risk setting. Our findings of an 89.0% clinical response or improvement rate, combined with noteworthy improvements in hygiene knowledge and behaviors, confirm the principal hypothesis that the addition of direct treatment with education and environmental support represents an effective paradigm for public health dermatology. The results resonate with some evidence of research in favor of the shift from reactive, clinic-based treatment to initiative-taking, community-baked health programs for the management of neglected tropical diseases (NTDs) like scabies and impetigo.

Our cohort's age distribution, with a surplus of children and young adults (60% under the age of 18)

residing in overcrowding (40.3%), is consistent with established epidemiology for skin NTDs. This trend exactly aligns with Pacific Island, Aboriginal Australian, and poor urban African and South American shantytown research in which overpopulation is repeatedly identified as the single most important social determinant for scabies and impetigo transmission [16,17]. The baseline rate of secondary bacterial infection of 37.7% is a disturbing observation, reflecting failure of early treatment and pointing to the serious morbidity of these diseases. The vicious process of parasitic or fungal infection penetrating the skin barrier to permit bacterial invasion and subsequent severe systemic sequelae like cellulitis, sepsis, and post-streptococcal glomerulonephritis [18]. Our baseline hand hygiene practice data also paint a picture of a permissive culture: low rates of persistent handwashing (36.4%) and high rates of fomite sharing (49.4%) are precisely the habits that transmit these infections.

The secret to the success of our intervention is bundling, which targets several sites of failure at once. The 89.0% two-week clinical rate of improvement is a good outcome. This figure is consistent with the cure outcomes of mass drug administration (MDA) campaigns for scabies using ivermectin or permethrin that normally achieve cure rates of 70-95% depending on protocol and setting [19]. However, one of the key differences in our model is the targeted, rather than mass, intervention. MDA is highly effective for acute reduction of community prevalence, but our model is potentially a more cost-saving and sustainable model for long-term control in hyperendemic settings as it targets resources at active cases and their close contacts [20]. The high efficacy also validates the use of WHO-standardized topical treatments (permethrin for scabies, mupirocin for impetigo) and assures that if compliance is made easier—a major hurdle in the real world—these medications are greatly efficacious.

The most encouraging outcomes outside of clinical healing are the self-attributed behavior changes. The self-reported 79.5% improvement in hand washing frequency and 84.9% reduction in towel/bedding sharing are perhaps as important as the clinical reactions for disease control in the longer term. What these results show is that the received health education was not merely absorbed like information but was successfully translated into action, most likely due to the provision of the hygiene kits [21]. This is important. It has been widely noted in other research that knowledge does not necessarily convert to change in behaviour, especially when obstacles like poverty and a lack of means exist [22,23]. By providing the necessary equipment (soap, towels), our intervention removed one of the material barriers, thereby making the promoted behaviours more likely to be followed. This is in line with the Capability, Opportunity, Motivation-Behaviour (COM-B) behaviour change model, showing that our intervention was successful in enhancing capability (with education), opportunity (with the availability of resources), and motivation (with CHW support) [24].

The factors associated with treatment failure, as identified by univariate analysis, hold immense value for optimizing future programs. The strong association of medication non-adherence with poor outcomes (OR: 6.8, $p<0.01$) is an expected but essential confirmation. It strengthens the idea that merely the dispensing of medication is not sufficient, and follow-up reinforcement by CHWs in inspiring and monitoring adherence is a crucial component of the intervention [25]. This finding is familiar to experience from tuberculosis control, where DOT is a pillar of treatment. Secondly, the continued adverse impact of overcrowding (OR: 4.1, $p=0.04$), even among the intervention group, is an ominous reminder of the limitations of biomedical and behavioral interventions. This discovery strongly argues that while community-based interventions are required, they should be accompanied by advocacy for and investment in improved housing infrastructure as a part of preventive intervention [26].

The extremely high patient satisfaction rate of 97.3% is no trivial outcome. It indicates acceptance and buy-in at the community level, which are two indispensable pillars of any public health program's scalability and sustainability [27]. The role of the CHW as a trusted, approachable, and well-informed intermediary between the formal health system and the community cannot be overemphasized. Their

behavior within this study underlies a huge body of literature on the critical role of CHWs in improving health outcomes within the context of various diseases in low-resource settings globally [28,29,30].

Conclusion

This study demonstrates that a multifaceted, community-based intervention—uniting targeted health education, distribution of simple hygiene products, and structured follow-up by doctors—is a very effective and acceptable strategy for the management and control of widespread communicable cutaneous infections in a high-risk, low-resource setting. The great clinical resolution rate noted (89.0%) and the extensive self-reported improvement in the main hygiene practices indicate the triumph of this model in not only treating individual cases, but also empowering the population to break the chain of disease transmission. The acknowledgment that crowding and lack of adherence are main barriers to success highlights the requirement to combine medical interventions with more comprehensive efforts to relieve socioeconomic determinants of health.

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