RESEARCH PAPER

Role of Health Workers in the Management of Mass Drug Administration in Lymphatic Filariasis Elimination Program of Nepal: A Mixed-Methods Study

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Abstract

Background: Lymphatic filariasis (LF), a disabling neglected tropical disease, persists in Nepal despite mass drug administration (MDA) efforts targeting 2030 elimination. Health workers (HWs) drive MDA success through planning, delivery, and community engagement, yet their knowledge, attitudes, and roles remain underexplored.

Methods: This mixed-methods study assessed HWs' contributions in three endemic districts (Sarlahi, Rautahat, Rasuwa). Exploratory sequential design began with three focus group discussions (FGDs; n=25 HWs) using purposive sampling until thematic saturation, analyzed via Braun & Clarke thematic analysis. This informed a cross-sectional survey of 257 HWs selected via multi-stage sampling (districts, municipalities, population-proportionate).

Results: Logistic regression identified predictors of knowledge (16 items; optimal=42.8%), attitudes (11 Likert items; favorable=45.1%), and engagement (composite; optimal=63.8%). Non-Hindu HWs (AOR=2.69, 95% CI 1.04–6.9) and urban workers (AOR=2.11, 95% CI 1.11–4.00) had superior knowledge; younger HWs showed better attitudes. Qualitative themes positioned HWs as strategic implementers, community mediators, compliance facilitators, teamwork enablers, and program optimizers—roles challenged by training gaps, logistics, and rumors. Mixed-methods integration revealed overburdened high-engagers with suboptimal attitudes. **Conclusion:** Findings underscore HWs' pivotal, multifaceted roles and the need for targeted training, incentives, and supervision to bolster Nepal's LF elimination. This evidence supports GPELF strategies in resource-limited settings.

Keywords: Lymphatic filariasis, mass drug administration, health workers, knowledge-attitude-engagement, Nepal, mixed-methods

How to cite this article: Ojha AB, Hasan N, Paneru DP, Raman RK, Adhikari HP. Role of Health Workers in the Management of Mass Drug Administration in Lymphatic Filariasis Elimination Program of Nepal: A Mixed-Methods Study. Int J Drug Deliv Technol. 2026;16(10s): 340-344; DOI: 10.25258/ijddt.16.10s.46.

Introduction

Lymphatic filariasis (LF), caused primarily by *Wuchereria bancrofti* and transmitted by mosquitoes, manifests as chronic lymphedema, hydrocele, and acute attacks, imposing profound physical, economic, and psychosocial burdens. Globally, ~36 million endure chronic manifestations, with Southeast Asia accounting for 57% of the burden (5.1 million DALYs). Over 893 million in 49 countries require MDA to interrupt transmission. The WHO Global Programme to Eliminate LF (GPELF, launched 2000) recommends annual MDA with diethylcarbamazine (DEC) plus albendazole (DA) or triple therapy (IDA) for ≥5 years in endemic areas, targeting <1% microfilaria prevalence.

Nepal, endemic in 63/77 districts (primarily Terai), affects ~25 million at risk. MDA began in 2003, achieving 70.4% coverage by 2018, yet five districts (e.g., Sarlahi, Rautahat) failed Transmission Assessment Survey (TAS)-3, and Rasuwa was newly mapped endemic. Extended to 2030, challenges include suboptimal coverage (22–89%), side-effect fears, and inadequate HW guidance. HWs—auxiliary health workers (AHWs), auxiliary nurse midwives (ANMs), health assistants (HAs)—orchestrate microplanning, drug distribution, supervision, reporting, and rumor mitigation, directly influencing compliance.

Prior studies highlight HW knowledge gaps (e.g., India: 5% aware of LF causation; Guinea: 21% correct), logistical hurdles, and workload, yet few employ mixed-methods in Nepal. This study fills gaps by: (1) exploring HW roles/perceptions; (2) identifying engagement facilitators/barriers; (3) quantifying knowledge, attitudes, engagement; (4) examining sociodemographic/program predictors; and (5) integrating findings for holistic insights. Evidence informs policy for Nepal's LF elimination and similar low-resource contexts.

Methods

Study Design

Exploratory sequential mixed-methods: Phase 1 qualitative FGDs informed Phase 2 quantitative survey, integrated via complementary analysis. Conducted April–July 2024 in endemic districts: Sarlahi/Rautahat (Terai, high-burden), Rasuwa (hilly).

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Phase 1: Qualitative
Purposive sampling recruited 25 HWs (6–12/FGD across 3 FGDs) until saturation, ensuring heterogeneity (cadre: AHW/ANM/HA/staff nurse; urban/rural; LF-MDA experience; seniority). Semi-structured Nepali guides probed roles, experiences, barriers/facilitators. Recorded (with consent), transcribed/translated (back-translation for 2 FGDs), member-checked (FGD-2 via phone). Braun & Clarke reflexive thematic analysis (6 phases: familiarization, inductive coding by two researchers [inter-coder κ=0.85, 85% agreement], theme generation/review/naming, report). Trustworthiness per Lincoln & Guba: credibility (triangulation), transferability (thick description), dependability (audit trail), confirmability (reflexivity).

Phase 2: Quantitative
Multi-stage: endemic districts (purposive); 12 municipalities (simple random); HWs (population-proportionate, n=257; Cochran formula, p=0.7, 5% error, 20% non-response). Inclusion: HWs involved in ≥1 LF-MDA round. Self-administered questionnaire (FGD-informed; English/Nepali; pre-tested n=30, Cronbach α=0.83, test-retest r=0.81): sociodemographic; knowledge (16 true/false, median cut-off=8/16); attitude (11 5-point Likert, median=38/55); engagement (12 items on planning/distribution/supervision/compliance, composite median=22/30). Kobo Toolbox ensured real-time validation. Data wrangled (Excel), analyzed (R 4.3.3): descriptives; chi-square (bivariate, $p<0.25$ entry); binary logistic regression (multivariable: forward LR, VIF≤5, 95% CI).

Mixed-Methods Integration
Joint display: qualitative themes mapped to quantitative predictors (e.g., training needs vs. knowledge gaps).

Ethics
Approved by Om Sterling Global University IRB and Nepal Health Research Council (NHRC). Informed consent (written/oral for FGDs); confidentiality (codes: HW01); data secured (passwords, encryption); no harms anticipated.

Results
Qualitative: HW Roles and Experiences
Five FGDs yielded six themes framing HWs' multidimensional roles (Table 1).

Table 1. Themes, Sub-themes, and Role Framing[1]

Theme	Sub-themes	Role Framing	Illustrative Verbatim
Strategic Implementers	End-to-end continuum; Stakeholder coordination	Operational leads	"From microplanning to reporting, we handle everything" (Rasuwa FGD) [1]
Contextually Competent Resources	Local adaptation; Communication gaps	Technical adapters	"We translate guidelines into local dialects" (Sarlahi FGD) [1]
Community Mediators	Rumor/fear management; Trust-building	Intermediaries	"People trust us more than posters" (Rautahat FGD) [1]
Compliance Facilitators	Adherence promotion; Adverse event handling	Motivators	"We convince hesitant families door-to-door" (Rasuwa FGD) [1]
Teamwork Enablers	FCHV/school collaboration	Coordinators	"FCHVs are our extended arms" (Sarlahi FGD) [1]
Program Optimizers	Supervision gaps; Incentive needs	Innovators	"More logistics would boost coverage" (All FGDs) [1]

Similarities: Universal end-to-end involvement, rumor challenges. Contrasts: Terai HWs emphasized logistics; hilly focused on terrain/mobility.

Quantitative: Participant Profile and Outcomes
HWs: 60.3% female, mean age 34.2±7.1 years, 85.2% Hindu, 68.5% rural, median experience 8 years (IQR 5–12).
Knowledge: 42.8% optimal (mean 7.2±2.8/16). Gaps: 58% unaware IDA regimen; 47% misidentified vectors.
Attitude: 45.1% favorable (mean 36.4±6.2/55). 62% agreed "MDA worthwhile despite refusals."
Engagement: 63.8% optimal (mean 21.5±4.1/30). High in distribution (78%); low in monitoring (41%).

Table 2. Knowledge, Attitude, Engagement Levels[1]

Outcome	Optimal n (%)	Suboptimal n (%)
Knowledge	110 (42.8)	147 (57.2)

Attitude	116 (45.1)	141 (54.9)
Engagement	164 (63.8)	93 (36.2)

Predictors (Tables 3–5):[1]

Table 3. Factors Associated with Knowledge (Multivariable)

Factor	AOR	95% CI	p
Non-Hindu	2.69	1.04–6.90	0.041
Urban	2.11	1.11–4.00	0.023
Favorable attitude	1.85	1.04–3.26	0.035
Non-Brahmin/Chhetri	0.46	0.24–0.88	0.019

Table 4. Factors Associated with Attitude

Factor	AOR	95% CI	p
Age ≤32	3.31	1.75–6.27	<0.001
Optimal knowledge	1.86	1.04–3.27	0.037
Optimal engagement	0.45	0.24–0.84	0.012

Table 5. Factors Associated with Engagement

Factor	AOR	95% CI	p
Unmarried	0.23	0.11–0.50	<0.001
Favorable attitude	0.47	0.25–0.87	0.016

Mixed-Methods Synthesis

Qualitative roles explained quantitative gaps: e.g., "communication gaps" theme linked to suboptimal knowledge; overburdened "implementers" showed inverse attitude-engagement.

Discussion

HWs emerge as LF-MDA linchpins, embodying strategic, social, and adaptive roles—aligning with global evidence (e.g., Indonesia: HWs boost coverage 20–30%; India: key for compliance). Suboptimal knowledge (42.8%) mirrors Guinea (21% LF etiology correct), South India (5% good awareness), and Bangladesh (low MDA practices), attributable to irregular training. Urban/non-Hindu advantages likely reflect exposure/diversity; ethnic disparities signal equity needs.

Paradoxical inverse attitude-engagement (AOR=0.45) suggests burnout: high-engagers (63.8%) prioritize action over optimism, echoing qualitative "optimizer" overload. Younger HWs' favorable attitudes (AOR=3.31) indicate receptivity, but unmarried lower engagement implies family/work balance barriers.

Strengths: Rigorous mixed-methods (sequential integration, saturation, representative sampling); policy-relevant (Nepal-specific). Limitations: Self-report (desirability bias, mitigated by anonymity); generalizability (three districts); recall (recent MDA).

Unlike KAP surveys, this frames HWs as "mediators/optimizers," advancing theory. Implications: (1) Tailored training (IDA, rumors); (2) Incentives/logistics (rural equity); (3) Supervision protocols; (4) FCHV integration. For GPELF post-2030, prioritize HW empowerment.

Conclusion

Nepal's LF elimination hinges on HWs' multifaceted roles, yet knowledge/attitude gaps undermine MDA. Targeted interventions—training, support, equity—can optimize engagement, accelerating 2030 goals. Findings inform NTD programs regionally.

Acknowledgements

Thanks to HWs, districts (Sarlahi, Rautahat, Rasuwa), EDCD, NHRC.

Funding

Self-funded PhD research.

Conflicts of Interest

None.

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