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Determinants of nurse turnover in rural primary health centres at micro, meso and macro levels within the health system of Tamil Nadu, India: a study protocol

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Determinants of nurse turnover in rural primary health centres at micro, meso and macro levels within the health system of Tamil Nadu, India: a study protocol

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Abstract

Introduction: Nurses play a critical role in delivering patient care services at the grassroots level. But, frequent nurse turnover in rural primary health centres (PHCs) becomes a barrier in achieving health goals in Tamil Nadu (TN), which is the highest populated state in South India. **Objective:** The study aims to identify the determinants of nurse turnover in rural PHCs and to inform the policy-making at micro, meso, and macro levels within the health system of Tamil Nadu, India. **Methods:** We will adopt an integrative qualitative design consisting of five phases. In phase 1, we will do a rapid literature review to develop an initial analytical framework. In phase 2, we will conduct a systematic review for upgrading the analytical framework into an interpretive framework on the determinants of nurse turnover and on the policies adopted in rural PHCs in India to overcome it. In phase 3, we will proceed with a qualitative inquiry at the micro-level and leading to an enriched interpretive framework. In phase 4, we will conduct a policy analysis at the macro, meso, and micro levels of the Tamil Nadu health system and will develop a nurse turnover policy outline. In phase 5, we will develop an integrated three-level analysis leading to a systemic multilevel framework on the determinants of nurse turnover with an overview of policy options in rural PHCs in Tamil Nadu. **Conclusion:** We anticipate the conceptualization of the current research design to be a path-breaking model for nurse researchers in conducting Health Policy and System Research. We metaphorically picturise the design as a plant grafting model and will additionally conduct an empirical case study analysis on the basis of the current design.

Keywords: determinants, framework, health system and policy, nurse turnover, primary health centres, rural.

Introduction

Tamil Nadu (TN) is the highest populated state holding 72 million population in South India. It has 38 districts (Government of Tamil Nadu, 2021) and 15,979 villages with 37 million rural people (Director of Census Operations Tamil

Nadu, 2011). Primary healthcare is delivered through both primary health centres (PHCs) and sub-centres in TN. There are 1,422 PHCs available to cover the 30,000 population per PHC in rural areas (Government of Tamil Nadu, 2016). A PHC is staffed by one medical officer, three to seven staff nurses, one pharmacist, one lab technician, and one radiographer. This may vary depending on the number of deliveries and inpatients per month. The responsibilities of nurses in the PHC are to attend routine antenatal/child/morbidity screening, immunizations, administration of medications, attending deliveries (consult a doctor during any emergencies), providing inpatient care, referral services, and maintenance of records. The government of TN recruits nurses to fill the vacant posts created every year to maintain the continuity

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of rural primary healthcare services. The nurse recruitment statistics at rural PHCs in TN as of 31 March 2020 indicated that 4,713 nursing posts were created by the state government, of which 4,073 posts were filled and 640 posts were vacant. TN ranks fourth among all 36 Indian states (28 states and 8 union territories) with a reported 13.5% of staff nurse turnover rate (National Health Mission, 2021). Therefore, the investigators aimed to investigate the determinants of nurse turnover in rural PHCs to inform policy.

The morbidity profile of the rural population in TN showed that 67% of them reported respiratory illness, non-communicable and communicable diseases (Dodd *et al.*, 2016; Gopalakrishnan, 2015). There is a high prevalence of cardiovascular diseases due to alcohol and tobacco intake (Kaur *et al.*, 2011). Moreover, almost 21.71 under-five children deaths per 1000 live births (2000-2015) (Liu *et al.*, 2019) are reported and the maternal mortality ratio (MMR) of TN is 60 (MMR of India is 130 (2016-2018)) (Ministry of Health and Family Welfare, 2021). However, TN leads the way to achieve universal health coverage by adopting round-the-clock rural primary healthcare services at the peripheral level (Kumutha *et al.*, 2014; Parthasarathi & Sinha, 2016). Rural communities have accepted primary healthcare services and prefer PHCs rather than private hospitals as the first mode of treatment consultation (Gopalakrishnan *et al.*, 2019; Kumar *et al.*, 2020). The increased utilization rate of rural PHCs for live births shows an example of the visible impact of TN primary healthcare policy (Kesterton *et al.*, 2010; Pandian *et al.*, 2013; Parthasarathi & Sinha, 2016). It is indeed reported that the majority of rural women select PHCs for live births because they are comfortable with nurses in PHCs who are competent to conduct deliveries independently (Padmanaban *et al.*, 2009; Sharma *et al.*, 2015) and consult doctors when needed (doctors may not be available most of the time, especially at night) (Zhong *et al.*, 2021). The cordial relationship between nurses and their families during antenatal check-ups was quoted as the major reason for

choosing the PHC for subsequent delivery and child immunization rather than private hospitals. However, the irony is that nurses frequently leave rural PHCs for urban tertiary hospitals (Jayanthi *et al.*, 2015; Mustafa *et al.*, 2021) or due to various personal and job factors. A significant number of PHCs functioning without a lady doctor and a shortfall of nurses leads to a decrease in the use of public healthcare facilities or delayed treatment seeking among rural communities (Kanmony J, 2017; Smith, 2018). Lack of proper recruitment and placement of trained nurses in needy areas, and their frequent turnover are the major obstacles to providing uninterrupted morbidity, maternal, and child health services to the rural population, who hold half of the total population of TN (Liu *et al.*, 2019; Nair & Panda, 2011). It is due to low investment in primary healthcare in rural areas (Mohan & Kumar, 2019). Nurse turnover is the voluntary or involuntary departure from rural PHCs within two years of posting (Moussa & Somjai, 2019). The current study investigates the determinants of nurse turnover and the policies adopted to overcome their turnover in rural PHCs. This study focuses mainly on the factors influencing voluntary turnover, which happens when nurses decide to leave PHCs. At the end of the study, the investigators can highlight the under-estimated determinants of nurse turnover which are not addressed in the policies. In addition to that, this study aims to suggest policy options for under-estimated determinants of nurse turnover in rural PHCs for policy formulation.

Research questions

- What are the determinants of nurse turnover in rural PHCs in TN?
- What policies have been adopted in rural PHCs to address the determinants of nurse turnover at micro, meso, and macro levels within the health system of Tamil Nadu?

Operational definitions

- Nurse turnover- It is the process of staff nurses leaving the organization or the nursing profession, or transferring to a new job

environment within two years of posting in rural PHCs in TN.

- **Determinants-** The dimensions in the TN health system that influence nurse turnover in rural PHCs: community, workplace, personal, and job characteristics.
- **Adopted Policies-** Policy interventions aim to reduce nurses' turnover, by preventing their resignations, - and retaining them in the workplace for a minimum period of two years in rural PHCs in TN.

Materials and Methods

We propose a qualitative integrative design by combining diverse methods to enhance the rigor of the systems and policy analysis. The integrative design is an exploratory, sequential, qualitative, and multilevel mixed-method research design. A sequential exploratory design will allow us to investigate the nurse turnover problem in five sequenced phases (Hallingberg *et al.*, 2018; Hasson *et al.*, 2021). The qualitative part of the research including in-depth interviews, focus group discussions, and documentary analysis will be the foundation of the study (Moreno-Poyato *et al.*, 2017). We will analyse, mix, and integrate the qualitative data at the micro, meso, and macro levels (Hasson *et al.*, 2021; Smith *et al.*, 2019) in the five phases. We will adopt a top-to-the-bottom inquiry approach from the national to state level (TN) to investigate nurse turnover issues in rural PHCs.

Phase 1

Phase 1 is a rapid literature review. The objective is to identify the possible determinants of nurse turnover and policies adopted in rural PHCs in India. It will help to understand surface knowledge about the topic at the national level and will provide knowledge to develop a review protocol. We will search Google tools and Open Access Sources and will select the full PDF articles in English that are published between 1 January 2001 and 31 July 2021. We will select the policy documents and qualitative studies on determinants of nurse turnover and policies adopted in rural PHCs in

India to overcome turnover. We will follow the steps of thematic synthesis analysis (Thomas & Harden, 2008); line-by-line coding, development of descriptive themes, and analytical themes. Both analytical and descriptive themes will be used for developing an analytical framework. The outcome of the phase will be an initial analytical framework on determinants of nurse turnover and policies adopted in rural PHCs in India and will be used as a guide for the systematic review inquiry process in the next phase.

Phase 2

Phase 2 is a systematic review. The objective is to identify the determinants of nurse turnover and policies adopted in rural PHCs in India. It helps to establish state-of-the-art knowledge about the topic at the national level. We will develop a protocol and search strategy and will do PROSPERO registration (University of York, 2009). We will screen policy reports, rural health statistics, quantitative, qualitative, and mixed studies on the magnitude and determinants of nurse turnover and policies adopted in rural PHCs in India. We will include the published articles from 1 January 2001 to 31 October 2021, available in the English language by searching through databases, grey literature, and tracking. The Mixed Methods Appraisal Tool (MMAT) 2018 (Hong *et al.*, 2018) and PRISMA flowchart 2020 (Page *et al.*, 2020) will be used for screening and documentation. We will narratively and thematically synthesize data using the Warming I- Freezing- Warming II- Comparing- Filtering (WFWCF) process (Jobin & Turale, 2019), which will be embedded in the combined methodological model (Noblit & Hare and Sandelowski & Barroso) (Sandelowski *et al.*, 2007). We will conduct thematic synthesis for identifying determinants and line of argument synthesis for finding the systemic relationship between the determinants. The themes will be used for upgrading the analytical framework into an interpretive framework. After that, we will do a policy review of the interpretive framework to examine the extent of the address of determinants in the policy documents. The outcome of the phase

will be the interpretive framework on determinants of nurse turnover and policies adopted in rural PHCs in India and will act as a guide for qualitative inquiry and policy analysis process in phases 3 and 4.

Phase 3

Phase 3 is a qualitative inquiry at the micro-level. The objective is to investigate nurses' experiences and expectations of jobs at rural PHCs in TN. It helps to map the nurse's expectations and contrast them with reality. It will provide a broader understanding of nurse turnover in rural PHCs. We will conduct in-depth interviews and focus group discussions to explore the determinants of turnover in rural PHCs in TN. The interpretive framework of phase 2 will guide the inquiry process. We will conduct a thematic analysis for identifying determinants and a line of argument analysis for finding the systemic relationship between the determinants. The derived themes will be used for upgrading the interpretive framework (phase 2) into an enriched interpretive framework on the determinants of nurse turnover in rural PHCs in TN. The outcome of the phase will be the enriched interpretive framework and will be used for the integrated three-level analysis in phase 5.

Phase 4

Phase 4 is a policy analysis at the macro and meso levels. The objective is to investigate the nurse turnover policy interventions in TN. It helps to study in-depth what was planned and what was implemented in reality for reducing the turnover of nurses in rural PHCs in TN. The enriched interpretive framework of phase 3 will

guide the policy inquiry process. We will conduct a policy document analysis to investigate what they say about addressing the turnover of nurses in TN. It will help to study in-depth what was expected for retaining nurses in rural PHCs. We will proceed with a qualitative inquiry through in-depth interviews to explore decision-makers and stakeholders' opinions about the turnover of nurses in rural PHCs in TN. It will help to study in-depth what happens in reality for retaining them. Content analysis will be used. The outcome of the phase will be the nurse turnover policy outline of TN and will be used for the integrated three-level analysis in phase 5.

Phase 5

Phase 5 is a policy implication analysis at the macro, meso, and micro levels. We will proceed with the integrated three-level analysis of the policy outline of TN (Phase 3) and the enriched interpretive framework (Phase 4). The objective is to identify the systemic determinants of nurse turnover in rural PHCs and policy responses (phases 3 and 4) at micro, meso, and macro levels in the TN health system. It helps to categorize the determinants and policies into three levels (micro, meso, and macro) by quoting what are the exact-estimated and underestimated factors of nurse turnover in rural PHCs in TN. The outcome of the phase will be a systemic multilevel framework on the three-level determinants of nurse turnover with an overview of policy options in rural PHCs in TN. The researcher will connect the identified determinant and policy options, which will give additional clarity for decision-making. The details of each phase in the study are given in Table 1.

Table 1: Details of each phase in the study.

Phases	Names	Levels	Variants	Timing	Weighting	Mixing and connecting	Outcome	Remarks
1.	Rapid literature review	National level	Develop an initial framework	Sequential	QUAL	-	Analytical framework	Aims to develop a protocol to conduct a systematic review
2.	Systematic review	National level	Upgrade the framework		Quan-QUAL	Analytical framework	Interpretive framework	The interpretive framework will act as a guide to proceed with further inquiry at rural TN PHCs
3.	Qualitative inquiry	Local level	Inquiry study at the micro level		QUAL	Interpretive framework	Enriched interpretive framework	Investigators will do the qualitative inquiry using the interpretive framework

Phases	Names	Levels	Variants	Timing	Weighting	Mixing and connecting	Outcome	Remarks
4.	Policy analysis	Local level	Policy study at the macro and meso levels			Enriched interpretive framework	Nurse turnover policy outline	Investigators will do the policy analysis using the enriched interpretive framework
5.	Policy implication analysis	Local level	Integrated three-level (macro, meso, and micro) analysis			Nurse turnover policy outline and enriched interpretive framework	Systemic multilevel framework	The systemic multilevel framework shows the determinants of nurse turnover and adopted policies in rural PHCs in TN. The final framework also highlights the determinants which are not addressed in the policies at the macro, meso, and micro levels

Setting

The study has two settings: - 1) Medical Services Recruitment Board for policy analysis (state level) and 2) Two selected rural districts in TN for qualitative inquiry. Medical Services Recruitment Board (MSRB) will be the setting for policy analysis at the macro and meso levels. MSRB was established in Chennai Corporation on 2 January 2012, by the Government of Tamil Nadu. The prime objective of the Board is to make an appointment for various categories of nursing staff for delivering high-quality patient care services in each nook and corner of TN. It organizes recruitment for the posts of nursing staff in 1,422 rural PHCs (National Health Mission, 2020) in TN. We will purposely select two accessible rural districts; Chengalpettu and Kanchipuram from researchers' locations (PC and LL) for qualitative inquiry at the micro-level.

Study participants

The study participants for policy analysis will be decision-makers (Health and finance department-at the administrative level), recruiters (at the managerial level), political, medical, and nursing actors who are veto players (at the stakeholders level). The study participants for the qualitative inquiry will be registered nurses in rural PHCs. The researcher will select the study participants purposefully from selected PHCs in both districts based on various factors like frequent access to study sites; sites where frequent turnover was reported; sites with unfilled posts for more than one year; and availability of study participants.

Inclusion criteria

The policymakers and stakeholders who are associated with TN MSRB nursing recruitment services at administrative and managerial levels for the past five years at state, district, and local levels will be included. The nurses who left their job in Chengalpettu and Kanchipuram PHCs within two years of service will be included. We aim to investigate the three-level factors contributing to their turnover in rural PHCs. The nurses who continue the patient care service in Chengalpettu and Kanchipuram PHCs for more than two years will be included. We aim to identify the three-level factors contributing to their retention in rural PHCs. The nurses who are registered as 'Nurses/ Midwives' with an active license in Tamil Nadu Nurses and Midwives Council will be enrolled in the study.

Exclusion criteria: The study participants who are not willing to give informed consent officially to participate in the study will be excluded.

Sampling technique and sample size

Snowball sampling will be used to recruit the study participants. The sample size of phase 3 will be 20 including policymakers and stakeholders. The sample size of qualitative inquiry in phase 4 will be 30 nurses. The overall sample size will be approximately ± 50 and may vary based on data saturation.

Plan of data analysis

We will conduct a thematic analysis for identifying determinants and a line of argument analysis for finding the systemic relationship between the

determinants. We will derive the major themes through the warming I-freezing-warming II-comparing-filtering process for extracting rigorous and trustworthy findings. We will confirm the ‘even’ themes which evolved similarly in both stages of warming I and II. In addition, we will filter the ‘odd’ themes based on relevance (Jobin & Turale, 2019). We will use the final overarching themes and themes for developing frameworks in the study.

Possible limitations of the study and how to overcome them

Understanding of policy data: We will read and re-read the data repeatedly till familiar with them. *Subjective interpretation:* We will code the data independently to assess any differences and will sort it through multiple discussion forums. Similarly, we will discuss and finalize the findings among us and the study participants to make sure that it is an accurate reflection of what they intended to say. *Skills of the researchers and their professional erudition and experience:* The team has strong qualitative research experience and we will use our knowledge and skills throughout the inquiry process. *Lack of generalization of study findings (at micro-level) because of the restricted data collection in two selected rural districts in TN:* We argue that the final systemic multilevel framework will be evolved through five stages of mixing and integrating data; analytical framework, interpretive framework, enriched interpretive framework, nurse turnover policy outline and its integrated three-level analysis. We believe that it will not compromise the quality of outcomes and generalization of study findings at the state level (TN).

Ethical considerations

We will obtain ethical clearance for phases 3 and 4 from the Institutional Human Ethics Committee, Sathyabama Institute of Science and Technology.

Discussion

At the end of the current study, we will attain two purposes 1) to inform and influence nurse turnover policies at the state level and 2) to develop a plant grafting model (through a case study analysis of

the current qualitative integrative design) for early-career Health Policy and System Research (HPSR) nurse researchers in India (and low-middle-income countries (LMICs)).

We hope to achieve the first purpose through a systematic, in-depth, and top-to-the-bottom approach to nurse turnover issues in rural PHCs in TN. Despite approaching the nurse turnover issues in rural TN PHCs directly, our search will be started from the national level context. At first, we will look twice (through rapid and systematic reviews) at the determinants and policies of nurse turnover problems in rural PHCs in India. Then, we will explore the state-level determinants and policies of nurse turnover problems in rural TN PHCs. After the integrated three-level analysis, we will develop a systemic multilevel framework on determinants and policies of nurse turnover in rural TN PHCs with an overview of policy options. There will be two outcome frameworks for future research. 1) Interpretive nurse turnover framework (India) of the study can be utilized as a guide for exploring nurse turnover determinants of rural PHCs in other states of India. 2) Systemic multilevel nurse turnover framework (TN) can be used for further in-depth exploration of nurse turnover determinants of rural PHCs in various districts of TN. This will help to investigate the variation of estimation of determinants and the impact of policies at the grassroots level.

In the second place, we anticipate that the conceptualization of the current qualitative integrative design (and its case study analysis) can be a pathbreaking model for nurse researchers in conducting health policy and system research. HPSR is defined as the process of exploring new knowledge that helps in the self-organization of societies to achieve health objectives (English & Pourbohloul, 2017; Peters, 2018), especially in LMICs (Sheikh et al., 2011). The boundaries of the HPSR field are still under construction and found to be fuzzy for nurse researchers (Mills, 2011; Whyte & Olivier, 2020) in India. Hopefully, we present the current design for those who are

struggling to fit and shape their research questions and develop a study proposal in their contexts (Whyle & Olivier, 2020).

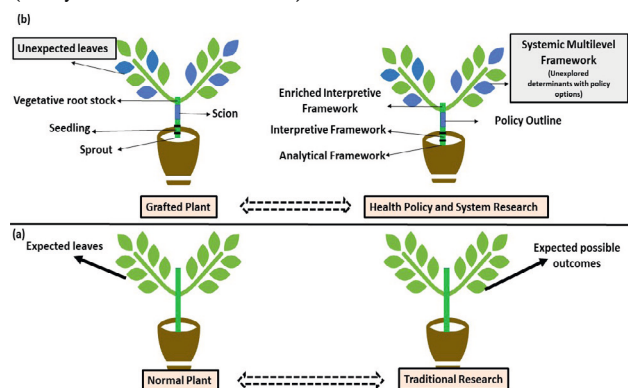


Figure 1: Plant grafting model (metaphoric representation of the research design).

A Metaphor is a mode of re-picturization of a situation, phenomenon, or conceptualization (McGregor *et al.*, 2019). We have used the metaphor of *plant grafting* to illustrate the conceptualization of the current design. It provides an opportunity to re-look at the design conceptualization from a unique perspective and helps the nurse researchers in India (and LMICs) to understand the HPSR process easily (Carpenter, 2008). We illustrate the current design development to a plant grafting model (Figure 1) by explaining how to grow a sprout (analytical framework) to a seedling (interpretive framework) and then, to a vegetative rootstock (enriched interpretive framework). Then, it shows how to graft (three-level integrated analysis) it with scion (policy outline) to develop a fully grafted plant (the systemic multilevel framework). Figure 1 also picturizes the differences between HPSR design from traditional research design in a simple way for nurse researchers. At our best, the metaphoric representation illuminates the development of design within the HPSR domain without distorting the purpose of the study. The model may be useful for investigating implementation issues or proposing actions within the health system to achieve health for all in India (and LMICs). This can be done by exploring the barriers and facilitators using health system building blocks and categorizing them at macro, meso, and micro levels with policy options for policy informing. At the

end of the current study (after understanding the strengths, weaknesses, threats, and opportunities of the proposed design) (Chambers *et al.*, 2018), we can additionally contribute a paper on the plant grafting model for nurse researchers to conduct HPSR studies in various contexts. In which, we will explain how can they use the model for fitting their research question effortlessly, shape the design, proceed with exploration, integrate health system determinants with policy options, and develop practically effective recommendations to inform decision-makers in their setting.

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