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ORIGINAL RESEARCH

Factors Predicting Mental Health Among Women in Low-Income Communities of a Changing Society: A Mixed-Methods Study

Lisa R Roberts[1], Vathsala Sadan[2], Rajeswari Siva[2], Manoranjitham Sathiyaseelan[2], Sara Emma Rosalind[2], Prema Suresh[2], Susanne B Montgomery[3]

[1]Loma Linda University School of Nursing, Loma Linda, CA, USA; [2]Christian Medical College-Vellore, College of Nursing, Vellore, Tamil Nadu, India; [3]Loma Linda University School of Behavioral Health, Loma Linda, CA, USA

Correspondence: Lisa R Roberts, Loma Linda University School of Nursing, 11262 Campus Street, Loma Linda, CA, 92350, USA, Tel +1 909 558 1000, Fax +1 909 558 0719, Email lroberts@llu.edu

Purpose: To explore women's mental health in India's rapidly changing society.

Participants and Methods: A convenience sample of low-income women (N = 286) in a medium-sized city in South-India participated in a mixed-methods, exploratory study in 2022. Institutional Review Board (IRB) approval was received from Loma Linda University in the US, and Christian Medical College-Vellore in India, in accordance with the declaration of Helsinki, prior to data collection. All study materials were forward and back translated for Tamil, the local language. Phase 1(n = 25) involved audio recorded key-informant interviews and focus groups. Verbatim transcripts were inductively coded, and emerging themes identified. Phase 2 (n = 261) entailed a quantitative survey including demographics, health history, and validated scales measuring mental health symptoms, coping strategies, social support, living situation, and life satisfaction. Data collectors were gender and language matched, research trained, community health nurses.

Results: Qualitative themes included: 1) benefits of living in the city, 2) double duty for women doing household work and paid work, 3) challenges of living in the urban environment, 4) advantages of living in the village, 5) struggles associated with village life. Quantitative results: the average Hopkins Symptoms Checklist (HSCL) score of 1.82 (*SD* = 0.70) exceeded the 1.65 cut-off score for anxiety and depression symptomology. Among participants with elevated HSCL scores (n = 129) the average was markedly elevated (*M* = 2.39, *SD* = 0.56). These women were more likely to rely on wishful thinking, religious coping, and reported more post-migration living difficulties, less social support, and less satisfaction with life. Regression analysis further explored variables associated with participant HSCL scores.

Conclusion: In this sample of low-income urban-dwelling women depression and anxiety symptomology was elevated. Given the limited mental health workforce and cultural stigmatization of mental health issues, further attention is required.

Keywords: India, urban women, post-migration, social support, coping

Introduction

Globalization and urbanization have produced mixed results with respect to benefits and risks for the average Indian. The positive effects include economic change, tremendous growth, and a promise of a better life for the middle-class segment of Indian society. With these changes, women are experiencing transition in terms of work expectations, family life, and environment.[1,2] The negative effects of globalization and urbanization affect low-income persons disproportionately and include expansion of slums and shifting role expectations to survive. As a result, globalization and urbanization are known to affect physical and mental health negatively, often resulting in decreased psychological security, and increased isolation and lack of support.[2–4] However, there is more to know about India than just its rate of globalization and urbanization.

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Within Indian communities, social support networks, culture, customs, traditions, and beliefs contribute to individuals' experiences of tensions inherent in being a woman in today's Indian society.[5] Race, class, and gender (intersectional tensions) influence health in addition to common social determinants of health (economic and physical environments), and are important to understanding women's health and health disparities in the Indian context.[6,7] See Figure 1.

India is vastly diverse in terms of culture and women's status, exemplified by the juxtaposition of its patriarchal society and traditional social norms limiting women's autonomy, and its history of powerful women in leadership.[8–13] Nevertheless, gendered roles and social expectations for women continue to include the expectation of childbearing and the importance of producing sons.[8,14,15] As part of these pressures, women often experience reproductive coercion, a form of domestic violence,[16–18] resulting in significant mental health burdens[19] with few resources. Poor women who have even fewer resources, are further disadvantaged and thus at higher risk for long-term, persistent mental health sequalae.

Evidence is lacking on Indian women's mental health needs, access and preferences for care. At the same time, a recent review study noted the limited studies about mental health in India and points to an increased risk for poor mental health outcomes for women compared to men, lack of mental health services available to women, high rates of domestic violence among married women, high prevalence of violence against all females, and increased mental health stigma.[20]

Within traditional Indian society, tightknit communities create a sense of belonging and social support and have been found to be a protective factor for mental health.[21] Protective factors identified in other populations include job security and satisfaction, higher education, and having a dependable spouse.[22] Thus, in a transitional society like India, with vast movements from rural to urban settings, social networks, culture, customs, traditions, and beliefs can both positively and negatively contribute to individuals' experiences of intersectionality and resulting health outcomes.[23] Drawing on the theory of intersectionality, the complex, cumulative, overlapping system of marginalization in the Indian context, including the influence of caste, class, gender, religion, disability, age, and ethnicity is believed to effect already vulnerable poor women even more negatively. These social structures cannot and should not be examined separately because the women's intersectional experience is greater than the sum of these factors which do not independently express the subordination[24] of women in India. Globalization and urbanization processes create additional identity stressors while individuals adjust to being in a new environment and meeting new expectations, often without the

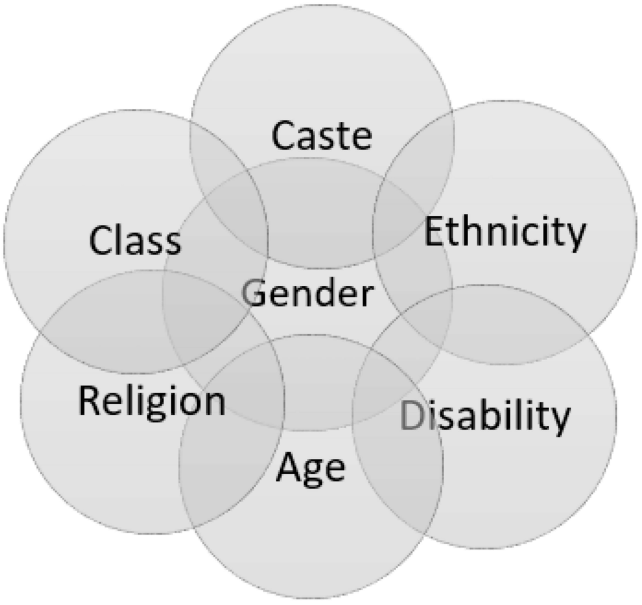

Figure 1 Intersectional tensions and social determinants of health influencing women's health.

support systems they may have previously had in a rural setting. On the other hand, rural populations typically suffer disparities in social determinants of health including less access to health resources, and lower health indicators that in and of themselves exert many pressures and expectations on vulnerable women.[2,25] Unfortunately, despite the well-documented sequelae, mental health challenges may not be viewed as a serious issue in India.[20]

The confluence of stress related to societal changes, gender discrimination, and intersectional tensions predisposes Indian women, to mental health issues and its sequelae. Understanding this confluence in the context of social determinants of health is important to understanding women's mental health which may be influenced by factors such as coping style, social support, religiosity, social norms, women's autonomy, migration, and innate resilience. While improving, the mental health workforce in India is extremely limited,[26] and since mental health utilization is highly stigmatized, low-income women may be actively and passively discouraged by families and communities from seeking help and have little if any recourse. The purpose of this study was to explore factors affecting mental health among low-income urban women in India's rapidly changing society, an important issue for nursing and public health programs to consider.

Materials and Methods

A convenience sample of community dwelling women (N = 286) from low-income areas of Vellore (a medium-size urban area in South India) known to be home to women who had migrated to this urban area from rural areas were recruited initially through community stakeholder contacts and then by using snowball sampling techniques. A mixed-methods sequential exploratory design was used to complete this two-phased study in 2022. Ethical approval was granted from the Institutional Review Boards of the authors' affiliated institutions, in accordance with the declaration of Helsinki, before commencing data collection. Rigorous forward and back translation[27] of all study materials from English to Tamil (the predominant local language) was undertaken to ensure transliteration for cultural understanding and equivalence of meaning. Data was collected by gender and language matched, research-trained, community health nurses. All interviews and focus groups were conducted in Tamil; however, some Urdu was also used based on participant preference. Written informed consent was obtained from participants prior to data collection and data were de-identified and reported in the aggregate. Informed consent included allowance for publication of anonymized responses.

Mixed-methods supports a comprehensive assessment of complex phenomena, such as human interaction in an environment changing due to globalization and urbanization.[28] Phase 1 (qualitative) consisted of audio recorded interviews (n = 9) and two focus groups (n = 7 and n = 9 respectively) using a semi-structured guide designed to explore how women perceive the rapid changes in Indian society and how their work and home life may have been affected (total participants in Phase 1 = 25). Audio recordings were transcribed, translated into English, and analyzed using standard methods including coding for emerging themes.[29]

The initial qualitative phase informed the research team's selection of study instruments for Phase 2 (quantitative) by first identifying themes/constructs that were important to measure in the subsequent quantitative phase. The final survey for the second phase included demographic variables including migration history, health, and reproductive history questions, as well as validated mental health scales. The survey data collection was conducted as face-to-face interviews due to low literacy levels and research inexperience among a convenience sample of participants (n = 261). Phase 1 and 2 participants were different participants, but recruited from the same population.

Measures

Descriptive Variables

Socio-demographic variables included age, marital status, family style, religion, education, occupation and migration history. Descriptive variables also included general health status, reproductive history, and history of migration and/or length of urban residence.

Validated Scales

Shortened Ways of Coping-Revised

A 14-item scale uses Likert-type ratings and consists of two subscales. These subscales, Wishful Thinking and Practical

Coping are each constructed of seven items measuring two distinct coping styles and has previously been used in India.[30,31] Each subscale is summed separately with higher scores (0–21) indicating greater use of either coping style. Cronbach's α = 0.77.

Brief RCOPE

A 7-item scale measuring positive and negative religious coping (three items each), as well as one item regarding overall intrinsic religiosity, has previously been used in similar populations.[31,32] Higher scores indicate more use of positive or negative religious coping (possible scores of 3–12 each) and greater identification with intrinsic religiosity (possible score of 1–4).[33] Positive religious coping subscale Cronbach's alpha = 0.89. Negative religious coping was not utilized due to a low Cronbach's alpha (0.14).

Hopkins Symptom Checklist (HSCL-10)

A 10-item Likert-type scale measuring depression and anxiety symptomology has previously been used with Hindi- and Urdu-speaking populations.[31,34] Items are summed and divided by 10 for a score. The original cut-off score of >1.85 used to indicate the presence of anxiety and depression symptomology was modified to >1.65 by Syed et al[34] to better fit the cultural context of women in Pakistan, and was used in the current study. Cronbach's α = 0.86.

Post Migration Living Difficulties

Originally, a 24-item scale, with possible responses of 0 to indicate no problem, 1 indicating a little problem, 2 somewhat of a problem, 3 "serious problem", and 4 indicating a very serious problem. Items can be summed or only the number of serious difficulties (3s and 4s) may be counted.[35,36] Hence, higher scores are indicative of experiencing more post-migration living difficulties or the severity of those difficulties. For this study, four items were modified to fit the local context and one item added, for a total of 25 items and possible scores of 0 – 100. Cronbach's α = 0.90.

Social Provision of Support

It is a 12-item scale which has been used with similar populations.[31,37,38] Five items are reversed and higher summed (12–48 possible) scores indicate greater perceived support in the form of guidance, reliable alliance, reassurance of one's worth, attachment, social integration, and the opportunity to provide nurturance to others.[39] Cronbach's α = 0.74.

Satisfaction with Life Scale

A 5-item Likert scale measures general satisfaction with life. Items are summed and higher scores indicate greater satisfaction with life.[40,41] Scores are categorized as "extremely dissatisfied" to "extremely satisfied". This scale has been translated into many languages and used with various populations, including women in India.[31,42] Cronbach's α = 0.89.

Autonomy

Autonomy was measured using a 6-item author developed scale containing questions drawn from published literature findings, based on qualitative feedback by women and specific to women in society who typically have low autonomy. Three items pertain to obtaining healthcare, buying major household items, and going to stay with natal kin, with response options regarding the decision-making process (whether a woman can make these decisions for herself she and family collaboratively decide, or if others decide for her). Three items pertain to going to the market, visiting relatives/friends, and having money set aside for personal use, with response options regarding whether or not permission was needed, if allowed. Higher scores indicate greater autonomy, with possible scores of 0–12. Cronbach's α - 0.83, indicating that it performed reliably among our participants.

Data Analysis Plan

Qualitative Data Analysis

Audio recordings were transcribed verbatim and double-checked for accuracy by comparing recordings and the transcripts. English translation of key informant interview and focus group transcripts, and field notes were coded line

by line according to grounded theory methods of analysis.[43] Initial emergent coding was completed, discussion with team members facilitated agreement on codes, and a final codebook was developed. All transcripts were then coded and quotes abstracted and categorized in the process of theme identification. Themes were validated through constant comparison methods and by key stakeholders.

Quantitative Data Analysis

All statistical analyses were conducted using IBM Statistical Package for the Social Sciences (SPSS), version 27. Demographic, health, and reproductive history were explored through descriptive analyses, conducted using frequencies for nominal variables and mean with standard deviation for continuous variables. Statistically significant differences between participants with elevated/not elevated HSCL (cut-off score 1.65) were identified using *t*-tests. Bivariable analysis exploring the associations of autonomy, wishful thinking, coping, social support, post migration difficulties, satisfaction with life, and social support, with mental health symptoms (HSCL) were performed. The influence of factors that had been found to significantly affect mental health was further explored using three linear regression models: all participants (N = 260), only those with HSCL scores (n = 130), and those with lower mental health scores (n = 129).

Results

Qualitative Findings

Five lists of issues combined into themes emerged from Phase 1 interviews and focus group discussions (n = 25). The issues listed are related to contrast in women's experiences with urban and village life and how each environment influences their daily functioning, often resulting in heavy workloads that women endure. All the participants in Phase 1 were women living in low-income areas of Vellore and ranged in age from 18 to 57 years of age, 88% were married and most had moved to the area upon marriage, the majority were housewives but many also did some paid work at home. Their education levels ranged from no formal schooling to having a college degree.

Theme 1: Benefits of Living in the City

Most participants readily noted the benefits of living in the city as having everything available, convenient, and presenting options. Participants liked having access to many types of goods and groceries nearby, having indoor plumbing and a public water pipe within a few steps of the home, the availability of automated teller machines (ATMs), major facilities (school, hospital, emergency services), government offices, and entertainment or leisure activities (movie theaters, parks, temples). In contrast to their former rural lives they mentioned that multiple transportation options are available in the city, and that they are available when desired/needed, rather than according to a fixed schedule.

> Here you can go and come at your convenience. (FG 2 participant)

Some women noted that after completing all their household work, they also did paid work at home, such as making beedis, sewing, tying flowers, and among those who were more educated, offering tutoring. Few women reported working outside of the home at a job, but the existence of the possibility was viewed favorably,

> You can see more opportunities for both educated and non-educated person. (FG 2 participant)

Participants also noted that women who go out for work get to see people around them, and that the jobs are nearby, which for some is a bit of an escape from everyday life.

> We suffered in the family. in the village. Now we are living here in peace. (FG 1 participant)

Women expressed feeling that their lives were less restricted and proscribed in the city compared to living in the village,

> You can find freedom here. (FG 2 participant)

Theme 2: Double Duty for Women

While participants discussed the positive aspects of urban living with its additional options for work and income compared to their rural situations, they also noted that a woman's work is never done, either recounting personal experiences or stating collective observations.

> I have to get up early in the morning, do the cooking and pack up the food, do the rest of the household works, leave everything under mother-in-law's hand in the safe mode and leave the home for work and again in the evening come back from work do the remaining household works and take care of the children. (KI 4)

Other participants noted that husbands do not engage in or help with household work, childcare, or extra preparations required for festivals or other social functions.

> He won't help. I get angry because I am also leaving around 8 in the morning. (KI 9)

Additionally, participants noted that as women they also become the caregivers for aging parents, in-laws, and other relatives.

Unique concerns for women working outside of the home were also noted when facing challenges and problems both at home and at the office/job.

> Women have to manage a balanced life both physically and mentally. (KI 10)

Seemingly, no concessions are given, no matter how tired a woman may be from her job. If she is seen as not taking good care of the children or making good food, the family may fight with her, scold, or beat her. Women are expected to maintain traditional roles,

> They want them to be like how they were before. (FG 1 participant)

Despite also working outside of the home.

> We have to overcome all this and do. They are expecting that they have to do the work perfectly. (FG 1 participant)

Coping with both traditional and work place expectations is a

> Very stressful life. (KI 10)

The consensus among participants was that the women's wages are turned over to the husband. Women have little say in how the money is used, and are given only the money necessary to run the household. If there is any money leftover she may try to save it, however, women typically put their children's needs before their own:

> I'd like to give good education to the children for their bright future. (KI 4)

Women are mostly expected to be in the home, manage the family with whatever money her husband gives her, and do all the household work. Husbands go out to make purchases for the home. Whether housewives or working outside of the home, women are dependent on men for security and protection. Persistent gendered expectations and discrimination were also noted as participants noted son preference and the importance of reproducing,

> They need a son, not a girl. He said not to come home if you have a daughter. (FG 1 participant)

Indeed, as one participant stated,

> It is a sin to be born as a woman in this world. (structured interview # 007)

But

> Even having a girl child is better than having no children. (FG 2 participant)

Women having no children, due to infertility or loss, or any other reason, reported that it is very distressing, causes conflict in the family, and threatens her status in the home.

Theme 3: Challenges of Living in the Urban Environment

General challenges included high prices, water scarcity, poor food quality, the house cannot be left unlocked for fear of theft, and \ environmental issues (flooding, sewer drainage, garbage, dust, and pollution) which are believed to cause many skin conditions, health problems, and allergies. However, while these challenges were briefly mentioned, safety and working outside of the home were discussed extensively.

Safety issues included traffic, crowded conditions (especially stressful during COVID), strangers observing women and/or children, and street dogs. Participants noted that children cannot play outside without being within eyesight of their mother/family member. Mothers worry about their children because of the things they hear happening at the hands of strangers. They have to be especially careful with their girls, being watchful of every little thing. The key informants consistently said it is not safe to go out at night or alone even during the day.

In contrast, participants in the first focus group who were part of women's empowerment group indicated a sense of security and freedom in their particular neighborhood:

> We are very comfortable here. In our area, there is no theft, murder etc. and no fear to live here. We are feeling that we are quite comfortable here. If we have any problems, the people who are living around us are encouraging and supporting us. All our relatives are staying outside. The people around us come forward to help us. (FG 1 participant)

However, when speaking of the larger urban area, their views were similar to those expressed by KI participants with fears about

> Chain snatching, theft, drugs [are there]. Child abuse is there. No safety. (FG 1 participant)

Women working outside of the home was acknowledged as a common reality of urban life. Participants matter-of-factly stated that women without children, or whose children are grown, are expected to go out for work. Women with young children who have to go out for work have to find someone to stay home with the child/ren, they need to have either their mother or mother-in-law take care of the child/ren. Or they try to work while their children are at school. This in turn increases women's worry when the children are on school breaks,

> I normally get scared when they are on leave. Are they are roaming out? These are some of the struggles. (KI 7)

Women who go out for work have to get up extra early to do their household work before leaving home, deal with the tension and stress of the job, and then come home to support the family. Supervisors' expectations are high and when not met, women are scolded and threatened with dismissal. Men harass women at work or on the way to work:

> Harassment is high. they are doing [it] in public. But no steps were taken. (FG 2 participant)

For village women who come to the city upon marriage it is a difficult adjustment

> It is hard for them when they start to live here. (KI 7)

Particularly if they also have to work outside of the home. Commuting to and from work is difficult, causing women to suffer in the midst of traffic.

> In some of the families, family members might get doubt when the women come home late either due to work load or transport. Parents were understanding, but on the husband's side they doubt. These kinds of sensitive issues are there. (FG 2 participant)

A lack of family support, due to natal kin (mother, maternal grandmother, etc.) being at a distance, is particularly difficult during pregnancy and postnatal period, or if a child is sick. A woman is expected to still manage all the housework herself, even when there are extenuating circumstances. There is nobody to help her out, she does all her work alone, which is time consuming and difficult to cope with.

Perhaps contributing to the safety concerns and distress around working outside of the home, participants expressed that neighbors, unlike in the villages, are hesitant to help others or get involved in any meaningful way. The women felt that they could not expect help from anyone except maybe an important relative. Neighbors gossip, engage in back

biting, grumbling, and fighting. Despite having so many people nearby, loneliness and isolation occur. Fear about who to call in case of an emergency was also prevalent.

Theme 4: Perceived Advantages of Living in the Village

When speaking of village life, the women often spoke in a wistful tone—even if they had just extolled the benefits of living in an urban area. Commonly noted was that the village environment is clean by comparison, with no air pollution, a beautiful natural environment and peaceful fields, and the availability of fresh vegetables (with or without money). The Primary Health Centre in the village was noted as readily available, and generally participants concluded that people are healthier in the villages, having fewer diseases than in the city.

Additionally, they fondly declared that the day-to-day workload was shared

> When we are in an extended family, we share the work and do the work like one person does the cooking, one person goes for shopping to purchase provision and vegetables, etc. (KI 1)

Moreover, they expressed that in times of difficulty, women can count on family/neighbors to help. Over and over, participants observed that villagers readily help each other, and are nice to each other. They also expressed the belief that the village is a safe environment, in which children can go out and play without any fear or mothers worrying. Children were described as free and happy. Overall, crime, safety, and health risks were not thought to be much of a problem in the village:

> In the village side it [crime] is less. (FG 1 participant)

Theme 5: Struggles Associated with Village Life

Most participants noted that travelling when living in the village is very difficult and that everything is at a great distance. Limited public transportation restricts options and opportunities. The bus stand is distant, the timing of buses infrequent and often unreliable, and the schedule is not always convenient. Travelling to the city is required for emergencies and hospital care, or to buy goods that are not grown/produced in the village.

Additionally, the women expressed that when you live in the village there is nowhere to go, and nothing to do during leisure time.

> In the village, everybody stays at home only. (KI 9)

The routine is monotonous—home, school, and back home again. Finally, they noted that children leave the village and go to the city for higher studies and work.

> You can find only the field work in the villages. (FG 1 participant)

Therefore, women often leave the village upon marriage, joining their husband's family in an urban setting.

Participants who expressed distress during the interview or focus group were immediately counseled by local community health nurses who regularly visit the community, and referred to the local clinic as needed.

Quantitative Results

Sample

The Phase 2 sample consisted of 261 low-income women living in low-income areas of Vellore, 19–61 years of age (see Table 1). Participants had lived in the urban area from four months to 60 years. The vast majority were married, or had been (97.9%), most lived in a nuclear family (69.3%), and less than one-third had a high school education or higher (27.1%). Hindus and Muslims were fairly evenly represented, and there were a few Christian participants (6.5%). Most women reported no health or psychosocial problems (73.2% and 75.5% respectively), and 98.5% denied use of tobacco or paan. In terms of reproductive health history, the average age at first pregnancy was 21.01 (SD = 3.88), with a range from 14 to 35 years old. The number of children per participant ranged from 0 to 7, with an average of 2.4 (SD = 1.17). When asked about current contraceptive use, nearly half (45.6%) of the women reported none. See Table 1 for details. Additionally, the number of sons per participant ranged from 0 to 6, with 306 total sons (M = 1.2) reported by

Table 1 Phase 2 Participant Characteristics (N = 261)

Characteristic	n (%)	*M (SD)*
Age (n = 261)		38.46 (10.12)
Years in urban environment		19.26 (14.19)
Marital status (n = 261)		
Single	5 (1.9)	
Married	236 (90.5)	
Separated/divorced	4 (1.5)	
Widow	16 (6.1)	
Family style (n = 261)		
Nuclear	181 (69.3)	
Joint	80 (30.7)	
Years married (n = 253)		18.56 (11.21)
Religion (n = 261)		
Hindu	125 (47.9)	
Muslim	119 (45.6)	
Christian	17 (6.5)	
Education (n = 261)		
College or vocational training	18 (6.8)	
Higher Secondary (high school)	53 (20.3)	
Secondary (middle school)	99 (37.9)	
≤Primary (grade school)	91 (34.8)	
Paid work (n = 261)		
No	145 (55.6)	
Yes (either at home or outside)	116 (44.4)	
Health problems (n = 261)		
None	191 (73.2)	
Anemia	8 (3.1)	
Diabetes	34 (13.0)	
Hypertension	22 (8.4)	
Other	6 (2.3)	
Tobacco and/or Paan use (n = 261)		
None	257 (98.5)	
Tobacco/Paan	4 (1.5)	
Psychosocial problems (n = 261)		
None	197 (75.5)	
Anxiety/depression	62 (23.7)	
Other	2 (0.8)	
Contraception (n = 261)		
None	119 (45.6)	
Sterilization	139 (53.3)	
Other	3 (1.1)	
Age at first pregnancy (n = 234)		21.01 (3.88)
Total number of children (n = 235)		2.4 (1.17)

participants. The number of daughters per participant ranged from 0 to 5, with 263 total daughters ($M = 1.0$) reported by participants.

Study Variables

As described in Table 2, on average among all Phase 2 participants, autonomy fairly high ($M = 8.06$, $SD = 2.58$), wishful thinking ($M = 9.84$, $SD = 4.08$) was employed less than practical coping ($M = 12.55$, $SD = 4.02$), and positive religious coping was utilized minimally ($M = 4.21$, $SD = 1.87$). The perceived social provision of support ($M = 34.52$, SD 4.28) was well above the midpoint. Post migration living difficulties (PMLD) were low ($M = 11.49$, $SD = 11.69$), with few

Table 2 Comparing Women with and without HSCL Scores ≥ 1.65

Parameter	Women with Elevated HSCL (n = 129)	All Other Women (n = 130)	t (258)	*p*	95% CI	Cohen's *d*
	M (SD)	M (SD)				
Autonomy	8.15 (2.64)	7.99 (2.53)	−0.488	0.626	[−0.79, 0.48]	0.06
Wishful thinking	10.84 (4.34)	8.85 (3.57)	−4.011	0.000	[−2.96, −1.01]	0.50
Practical coping	12.44 (3.86)	12.68 (4.19)	0.475	0.635	[−0.75, 1.22]	0.06
Positive religious coping	4.69 (2.15)	3.72 (1.40)	−4.32	0.000	[−1.42, −0.53]	0.84
Post migration living difficulties	16.62 (13.71)	6.56 (6.30)	−7.51	0.000	[−12.70, −7.41]	0.94
Social Provision of Support	33.08 (4.45)	35.95 (3.60)	5.72	0.000	[1.89, 3.87]	0.71
Satisfaction with Life	21.78 (8.30)	26.53 (4.81)	5.63	0.000	[3.08, 6.41]	0.70
Hopkins Symptom Checklist	2.39 (0.56)	1.26 (0.18)	−21.89	0.000	[−1.23, −1.03]	2.72

participants experiencing numerous serious difficulties; however, the range in scores was 0–70. The most frequently endorsed serious PMLD items were "worries about family back at home" (24.5%), "family problems" (16.1%), "concerns about poverty" (16.9%), and "loneliness and boredom" (15.7%). The average score for satisfaction with life ($M = 24.19$, $SD = 7.15$) fell within the slightly satisfied range, defined as scores 21–25. The average HSCL ($M = 1.82$, $SD = 0.70$) exceeded the 1.65 cut-off score for anxiety and depression suggested in similar populations,[34] and nearly met the original cut-off score of 1.85. Of note, among participants whose individual scores exceeded the 1.65 cut-off (n = 129) the average was markedly elevated ($M = 2.39$, $SD = 0.56$), well above either cut-off score, indicating significant anxiety and depression symptomology.

Independent Samples *t*-Tests

Also described in Table 2 are comparisons of participants with an elevated HSCL to those below the 1.65 cut-off score. To determine statistical differences t-tests were conducted. Notably, the women were not statistically different on demographic variables. Women with elevated anxiety and depression symptomology (HSCL ≥1.65) were significantly different in terms of relying on wishful thinking and positive religious coping, experiencing post migration living difficulties, social provision of support, and satisfaction with life, with medium to large effect sizes (see Table 2 for details). Additionally, working women, operationally defined as doing paid working either at home or at a job outside of the home (n = 116), had significantly higher HSCL ($M = 1.98$, $SD = 0.77$) than non-working (n = 145) women ($M = 1.70$, $SD = 0.62$), t (258) = −3.17, $p = 0.002$, Cohen's $d = 0.40$.

Bivariate Analysis

Bivariate analysis between variables of interest and HSCL was conducted for model building purposes to explore if any of the independent variables were significantly associated with HSCL (not tabled). Significantly associated variables included PMLD (0.552, $p = 0.000$), wishful thinking (0.375, $p = 0.000$), positive religious coping (0.188, $p = 0.002$), social provision of support (0.367, $p = 0.000$), and satisfaction with life (−.457, $p = 0.000$). When only women with elevated HSCL (n = 129) were selected, age (−.215, $p = 0.014$) was also significantly correlated, but positive religious coping was not, while PMLD, wishful thinking, social provision of support, and satisfaction with life remained significantly associated.

Analysis of Predictors of HSCL

Variables significantly associated with HSCL on bivariate analysis were used to conduct linear multivariate regression analyses. As seen in Table 3, in the first model, which included all participants, PMLD, wishful thinking, positive religious coping, social provision of support, and satisfaction with life explained 44% of the variance. PMLD, wishful thinking, and social provision of support remained significant in the model.

To explore differences in predictor variables among women with low HSCL (<1.65) vs women with elevated HSCL (≥1.65), bi-variably significantly associated variables with mental health (depression and anxiety) symptomology were used. These included age, PMLD, wishful thinking, social provision of support, and satisfaction with life. The second model included only

Table 3 Regressions of Predictor Variables on Mental Health, Measured by HSCL (Depression and Anxiety Symptomology)

	Variable	B	SE	t	p	95% CI
Model 1: All participants (N = 260)	Constant	2.377	0.339	7.015	0.000	[1.709, 3.044]
	PMLD	0.027	0.004	7.683	0.000	[0.020, 0.034]
	Wishful thinking	0.023	0.009	2.624	0.009	[0.006, 0.041]
	Positive religious coping	0.014	0.018	0.781	0.436	[−0.022, 0.050]
	Social provision of support	−0.027	0.008	−3.228	0.001	[−0.044, −0.011]
	Satisfaction with life	−0.009	0.006	−3.228	0.118	[−0.020, 0.002]
	R^2	0.44				
	F for change in R^2	39.20***				
Model 2: Participants with HSCL <1.65 (N = 130)	Constant	1.525	0.176	8.656	0.000	[1.176, 1.874]
	Age	0.002	0.001	1.215	0.227	[−0.001, 0.005]
	PMLD	0.003	0.003	1.351	0.179	[−0.002, 0.008]
	Wishful thinking	0.007	0.004	1.479	0.142	[−0.002, 0.015]
	Social provision of support	−0.007	0.004	−1.546	0.125	[−0.015, 0.002]
	Satisfaction with life	−0.007	0.003	−1.919	0.057	[−0.013,0.004]
	R^2	0.15				
	F for change in R^2	4.425**				
Model 3: Participants with HSCL ≥1.65 (N = 129)	Constant	2.423	0.479	5.055	0.000	[1.474, 3.371]
	Age	−0.005	0.005	−1.013	0.313	[−0.014, 0.004]
	PMLD	0.017	0.004	4.433	0.000	[0.009, 0.024]
	Wishful thinking	0.018	0.011	1.675	0.096	[−0.003, 0.040]
	Social provision of support	−0.005	0.010	−0.486	0.628	[−0.025, 0.015]
	Satisfaction with life	−0.008	0.006	−1.258	0.211	[−0.020, 0.004]
	R^2	0.34				
	F for change in R^2	12.569***				

Notes: **p < 0.01, ***p < 0.001.
Abbreviations: HSCL, Hopkins Symptom Checklist; PMLD, Post Migration Living Difficulties; CI, confidence interval.

women with low HSCL, and while 15% of the variance was explained, none of the predictor variables remained significant. The third model, which included only women with elevated HSCL, explained 34% of the variance and PMLD remained significant.

While data collectors did not score the HSCL immediately, when participants indicated numerous responses of "quite a bit" or "extremely", the research team was informed and follow-up arranged. Data collectors also wrote comments on the survey instrument when participants offered additional information indicating distress, and again notified the research team. Follow-up was arranged with the regular community health nurses assigned to the community, or referral to the clinic, both affiliated with a large multi-specialty, teaching hospital within 10 km.

Discussion

The use of mixed methods design for this study ensured that qualitative data informed the selection of constructs to be measured in the quantitative survey, and informed the interpretation of the results from the survey, adding to the validity and depth of understanding emerging from the study.[28,44,45] The findings of the study indicate that low-income women in Vellore are at increased risk for elevated depression and anxiety symptomology. Indeed, the average HSCL score for the entire sample was above the cut-off score, with half of the sample exceeding the cut-off score. Among this half of the sample, the average was markedly increased, indicating significant anxiety and depression symptomology. There were no significant demographic differences between women this elevated vs low HSCL scores, and therefore, it is important to understand other variables influencing this dynamic. Clearly, though these women lived in the same context, with the same social determinants of health at play, there were other risk factors influencing their mental health.

Among women with elevated HSCL, wishful thinking and positive religious coping were more heavily utilized, and they were likely to be experiencing serious post migration living difficulties, lower social provision of support and lower satisfaction with life. Their HSCL scores were more than two standard deviations higher than women with HSCL scores below the cut-off score.

Furthermore, these quantitative results closely align with the qualitative themes, adding to the validity of these important study findings.[46]

In the qualitative phase, participants enumerated many benefits of living in an urban environment, but also voiced safety and environmental concerns, and changed quality of relationships and opportunities for tangible support resulting in them having few people, if anyone, they could rely on for help, or with whom they could have authentic relationships. The women also voiced the tension between traditional expectations and new expectations in the city that on top of their household responsibilities could provide them with some additional family income. Indeed, there was an increasingly noted expectation for them to work outside of the home or work for money in the home, especially for those whose children were out of the home. The expectation for women to work is reflected in that nearly half (44.4%) of the quantitative sample did paid work at home or worked outside of the home. As noted in a previous study, while being in the city does offer increased income opportunities, it also results in ruptured social relations.[47,48]

In contrast, despite the many positive things participants noted about their move to their urban homes, village life was primarily described in idyllic terms, other than the inconveniences associated with distance facilities and resources. However, the lack of opportunities in the village were also noted and provided as the main reason that women find themselves in the city upon marriage. The adjustment to city life was acknowledged as difficult, and is reflected in the quantitative data. Similar to other studies PMLD was the most salient predictor of mental health symptomology.[35,36] Serious PMLDs, including worries about family or having family problems, poverty, and loneliness, reflect the psychological insecurity, social isolation, and lack of support expressed in the qualitative phase of the study and aligns with the literature on the negative effects of globalization and urbanization.[2–4]

On the other hand, some women expressed experiencing greater freedom in the city, which is reflected in the relatively high levels of autonomy noted in the study and corresponds to findings from another study in South India, indicating that historically disadvantaged women are especially responsive to new opportunities.[49] There is some evidence in the literature that freedom, autonomy, and escape from traditional constraints may actually be motivating factors for migration and city dwelling for some women.[50]

Overall, however, women qualitatively expressed gender discrimination and experiencing distress related to reproductive expectations and challenges. Similarly, evidence of gender discrimination is found in the quantitative data. Participants reported a total of 569 children, 306 (58.8%) sons, and 263 (46.2%) daughters, which is similar to the skewed percentages noted nationally according to 2019 United Nations data, despite being in South India where gender equity is thought to be better.[51–53] The distress pertaining to reproductive expectations and/or challenges is evident in both the qualitative and quantitative data, which also aligned with previous studies reported on in the literature.[8,14,31,54]

India is a vast country of richly varied people, culture, and environments. Emerging lists of challenges and benefits that were broadly grouped into themes are specific to the women living in low-income neighborhoods of Vellore. However, as we noted previously, these findings were confirmed by the data collected in the quantitative phase. Limitations of the study include a relatively small sample size and convenience sampling for the quantitative survey, limiting generalizability. Selection bias, self-report, and potential unobserved confounders are also limitations to be considered. The cross-sectional design does not allow causal attribution; however, it is useful for establishing preliminary data among a hard-to-reach population that is under-represented in research, and provides data to be used in planning future studies involving intervention. Additionally, though the survey was pilot tested and analyzed for reliability and validity before completing data collection, further psychometric testing with a randomly selected sample would further ensure robustness.

In light of the study findings which revealed the elevated depression and anxiety symptomology among women in low-income urban areas, and well published non-acceptance of mental health needs and services, next steps involve development and implementation of a culturally contextualized intervention. We aim to support these women struggling with mental health issues with post migration challenges, through community-based, self-help programs that are less stigmatizing and could also provide an alternative source of social and tangible support by widening the women's social circles. The program should promote effective personal coping strategies and help women access sources of social support embedded in the community, while supporting autonomy.

Conclusion

This study sought to elucidate both risk and protective factors affecting mental health among low-income urban women in Vellore, who were hypothesized to be affected by India's rapidly changing society. Urbanization and globalization are known to instigate societal changes, what was not known was how these changes affect women in this particular context. Historic gender discrimination and current societal changes creating intersectional tensions noted through observation and the literature informed our opinion that these women were predisposed to mental health issues. We did indeed find a strong pocket of women fitting these concerns but also heard women speak of negative perceptions and stigma[26] involved in admitting to such needs and regarding utilization of any services to address them, if they were available. Thus, a self-help stress reduction and resiliency promoting intervention that helps women tap into their many protective factors is suggested as a next step. This study offers greater understanding of influencing variables and predictors of mental health among this vulnerable population, which may be used to guide the development of a community health program designed to address their needs.

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