



Women's Reproductive and Behavioral Health - A Comparison of Living Conditions in Two Northern Indian Slums

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ABSTRACT: This cross-sectional study aimed to examine the differences in living conditions, behavioral health and reproductive health among women living in two different types of slums in northern India. A house-to-house survey of randomly selected women 18 and older living in Rajiv Colony (concrete housing) and hutments near Mansa Devi complex in Haryana, India was conducted between October 2016 and November 2016. A descriptive analysis was performed using statistical software SAS 9.3. Of the 134 participants surveyed for this study, 68 lived in Rajiv Colony and 66 lived in the Hutments near Mansa Devi Complex. A majority of participants in both types of slums sought care from fake medical practitioners. Significant differences were found in behavioral health, reproductive health, and living conditions of participants depending on where they lived. There is a need for sanitation awareness and hygiene education among slum dwellers in northern India. Future studies should consider evaluating knowledge and perception of contraception use among slum dwellers.

Keywords: Reproductive Health; Slums; Women's Health and Sanitation.

INTRODUCTION: According to World Health Organization, one third of the world's urban population lives in slums.¹ From 2000 to 2012 the proportion of people living in slums has decreased from 39% to 33% of the urban population. However, during the same period the absolute number of slum dwellers increased from 700 million to 863 million.² Similarly, the percent of slum dwellers in urban India decreased from 24% (in 2002) to 22% (in 2011) while the absolute number of slums dwellers increased from 52 million to 65 million.³

One major reason for the alarming increase in urban slum populations is the migration of poor individuals from rural areas.⁴ Common characteristics of urban slums in India include overcrowding, poor housing, clogged drains, lack of garbage disposal, poor personal hygiene, and extremely poor sanitation.⁵ The overall living conditions in slums exacerbate the health risks of slum dwellers and contribute to various health problems like undernutrition, delivery-related complications, sexually transmitted infections, and skin diseases.^{6,7} In particular, the health of women living in urban slums is very poor. So far, very few studies have examined the health of women living in slums in India.⁴ Previous studies have reported a significant difference in reproductive and women's health between slums and non-slum areas.^{4,8} A study conducted by Hazarika found that less than half of the women

living in the slum areas in India were using contraceptive methods and the cessation rate was higher among these women.⁴

There is also a lack of accurate data on slum areas; the data obtained from clinics, hospitals, or national mortality registries underestimates the prevalence underlying medical conditions. Since the living conditions in slums are very different from the living conditions in the rest of the city, health priorities for slum dwellers might differ from national or the urban health priorities.⁹ Slum-specific data is needed so that interventions can be made accordingly. The goal of this study was to examine the difference in living conditions, behavioral health and reproductive health of women living in two different types of slums in India.

MATERIALS AND METHODS: This was a cross-sectional study. For this study, a house-to-house survey of randomly selected women 18 and older living in two different types of urban slums areas-Rajiv Colony (N=68) and hutments in the vicinity of Mansa Devi complex (N=66) in Panchkula, Haryana, India was conducted between October 2016 and November 2016. Participants included only the house-to-house survey respondents willing to participate in the study. The survey questionnaire was designed to assess the reproductive health of women living in those urban slum areas. The survey questionnaire was used to

collect information about various topics including socio-demographic characteristics, living conditions (e.g., number of rooms in the house, access to toilets), behavioral characteristics, reproductive history, use of family planning methods (e.g., condoms, IUDs), menstruation hygiene, and illnesses in the past week. Participant responses were kept confidential. This study was exempted from Institutional Review Board approval. For the convenience of the readers, Rajiv Colony will be referred to as 'Slum A' and Hutments in the vicinity of Mansa Devi Complex as will be referred to as 'Slum B'.

Slum A: Slum A consisted of concrete housing (as shown in Figure 1). Open sewage, flies, and trash were commonly observed in this area. A nearby body of water contained floating garbage and filth. There was an "Anganwadi" (courtyard shelter) in the middle of the slum dwelling providing contraceptive counseling and family planning education to the slum dwellers. The nearest government hospital was about 4 kilometers away.

Slum B: This slum dwelling consisted of huts (as shown in Figure 2). People living in this slum defecated in the open due to lack of toilet access. Drinking water was supplied to this locality by government water tankers. Because this locality was close to a Hindu Temple, slum dwellers had access to the charitable hospital of alternative medicine ('Ayurveda'). The area surrounding the temple was clean.

Data Analysis: A descriptive data analysis was conducted using statistical SAS software version 9.3 (© 2002 - 2010) of the SAS System for Windows (Cary, NC). Prevalence rates were calculated for the variables of interest. A two-sided p-value of 0.05 was considered significant.

RESULTS AND DISCUSSION:

Results: Table 1 represents the demographic characteristics of women living in the slums. Overall, 134 women were surveyed for this study. 68 were from slum A and 66 were from the slum B. The majority of women enrolled in this study were ≤ 24 years of age (29.3%), had ≤ 5 family members (52.2%), were married (83.6%), were illiterate (69.8%) and were unemployed (62.4%). Overall, 69.8% were uneducated and 71% of women had a monthly household income of 5000-10,000 Indian Rupees. Most of the women's partners were manual laborer (65.9%).

As shown in Table 2, the majority of women used hand soap (75.4%), were non-smokers (91.8%), did not chew tobacco (87.3%), and were found seeking

healthcare from quacks or unqualified medicine practitioners in the neighborhood (41.9%). Table 3 depicts the living conditions of women in the slums. The majority of women living in the slums had ≤ 5 family members living with them in the household (52.2%), had a house with 1-2 room/s (95.4%), and had no access to toilets (53.7%). A higher proportion of household had Liquefied Petroleum Gas (LPG) for cooking purposes (49.3%).

As shown in Table 4, the majority of couples relied on Abstinence or the Pull Out method to prevent pregnancy (42.7%). 20.2% of couples had a history of abortion, with 6.7% reporting two or more abortions. The majority of women used cloth during menstruation (53.9%) and appeared anemic (61.2%).

Comparison between Slum A and Slum B: Most of the demographic characteristics (as shown in Table 1) had similar distribution for women in both slum A and slum B. The illiteracy rate was much higher among women in slum B (86.4%) compared to those in slum A (48%) with a significance value of <0.001 . There was a significant difference in the monthly household income of those in slum A and B (p-value = 0.01). The unemployment rate was lower among women in slum B (40.9%) compared to those in slum A (83.6%).

While 98.5% of women living in Slum A washed their hands with soap, only 51.5% of women living in Slum B used soap for hand washing. A higher proportion of women in Slum B were smokers (13.6%), had a family member living in the household who smoked (53.0%), or consumed alcohol (43.9%) compared to those in Slum A. Additionally, a higher proportion of women in Slum A sought healthcare from quacks in the neighborhood in comparison to those living in hut settlements in Slum B.

As shown in Table 3, a higher proportion of women in Slum A had ≤ 5 members living in their household (64.7%) compared to slum B. Almost 98.5% women in Slum A had no access to toilets and defecated in open while only 10.3% did the same in slum B. The majority of women in Slum B used kerosene and wood/cow dung ('chulha', a local parlance for 'cooking stove') for cooking purposes (90.9%).

When comparing the reproductive health and behaviors of women, it appears that a higher proportion of women in Slum A have undergone tubectomy (45.0%) than those in Slum B (16.3%). Although the history of abortions among women was similar in both the slum areas, a higher percentage of women in Slum B self-reported 2 or more abortions, used cloth during menstruations (63.6%), and appeared anemic (65.2%) compared to those Slum A.

Table 1: Demographic Characteristics of Women by Type of Slum Housing in India, 2016.

Characteristics	Overall N (%)	Rajiv Colony (Concrete Housing) N (%)	Hut Settlement N (%)	P-value
Total	134	68	66	
Age				0.41
≤24	39 (29.3%)	19 (28.4%)	20 (30.3%)	
25-29	19 (14.3%)	14(20.9%)	5 (7.6%)	
30-34	20 (15.0%)	10 (14.9%)	10 (15.2%)	
35-44	35 (26.3%)	14 (20.9%)	21 (31.8%)	
≥45	20 (15.0%)	10 (14.9%)	10 (15.2%)	
Marital Status				0.26
Never Married	7 (5.2%)	5 (7.4%)	2 (3.0%)	
Divorced	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Living Separately	4 (2.9%)	1 (1.5%)	3 (4.6%)	
Married	112 (83.6%)	58 (85.3%)	54 (81.8%)	
Widowed	11 (8.2%)	4 (5.9%)	7 (10.6%)	
Level of Education				<0.001
None	81 (69.8%)	24 (48.0%)	57 (86.4%)	
Less than 10 th grade	26 (22.4%)	18 (36.0%)	8 (12.1%)	
10 th Grade	3 (2.6%)	3 (6.0%)	0 (0.0%)	
Secondary School (11 th and 12 th)	5 (4.3%)	5 (10.0%)	0 (0.0%)	
College	1 (0.9%)	0 (0.0%)	1 (1.5%)	
Monthly household Income (in Rupees)				0.01
< 5000	23 (17.7%)	11 (16.4%)	12 (19.1%)	
5000-10,000	93 (71.5%)	43 (64.2%)	50 (79.4%)	
10,001-14,999	5 (3.9%)	5 (7.5%)	0 (0.0%)	
15,000-19,999	6 (4.6%)	5 (7.5%)	1 (1.6%)	
≥20,000	3 (2.3%)	3 (4.5%)	0 (0.0%)	
Employment Status				<0.001
Not Employed	83 (62.4%)	56 (83.6%)	27 (40.9%)	
Employed	50 (37.6%)	11 (16.4%)	39 (59.1%)	
Occupation				<0.001
Unemployed	84 (64.6%)	56 (86.2%)	28 (43.1%)	
Transportation	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Skilled Workers	3 (2.3%)	2 (3.1%)	1 (1.5%)	
Manual Labor	29 (22.3%)	5 (7.7%)	24 (36.9%)	
Sales	5 (3.9%)	0 (0.0%)	5 (7.7%)	
Cleaning and Maintenance	9 (6.9%)	2 (3.1%)	7 (10.8%)	
Partner's Occupation				0.39
Transportation	6 (7.3%)	4 (8.5%)	2 (5.7%)	
Skilled Workers	6 (7.3%)	5 (10.6%)	1 (2.9%)	
Manual Labor	54 (65.9%)	26 (55.3%)	28 (80.0%)	
Sales	8 (9.8%)	4 (8.5%)	4 (11.4%)	
Cleaning and Maintenance	8 (9.8%)	8 (17.0%)	0 (0.0%)	

Table 2: Behavioral Characteristics of Women by type of slum housing in India, 2016.

Characteristics	Overall N (%)	Slum A N (%)	Slum B N (%)	p-value
Hand Wash				<0.001
Use Soap	101 (75.4%)	67 (98.5%)	34 (51.5%)	
Ash/Sand	1 (0.8%)	0 (0.0%)	1 (1.5%)	
Water only	1 (0.8%)	0 (0.0%)	1 (1.5%)	
Both soap and Ash	31 (23.1%)	1 (1.5%)	30 (45.5%)	
Smoking Status				0.02
Yes	11 (8.2%)	2 (2.9%)	9 (13.6%)	
No	123 (91.8%)	66 (97.1%)	57 (86.4%)	
Smoking Status of Partner/Family Member living in the household				0.11
Yes	68 (50.8%)	33 (48.5%)	35 (53.0%)	
No	66 (49.3%)	35 (51.5%)	31 (46.9%)	
Chew Tobacco				
Yes	17 (12.7%)	9 (13.2%)	8 (12.1%)	0.20
No	117 (87.3%)	59 (86.8%)	58 (87.9%)	
Alcohol Consumption by Partner/family member living in the household				0.13
Yes	58 (43.3%)	29 (42.7%)	29 (43.9%)	
No	76 (56.7%)	39 (57.4%)	37 (56.1%)	
Seek Healthcare at/from				0.002
Government Hospital/Alternative medicine charitable hospital	27 (36.5)	15 (34.1%)	12 (40.0%)	
Private Clinic	11 (14.9%)	9 (20.5%)	2 (6.7%)	
Quack	31 (41.9)	20 (45.5%)	11 (36.7%)	
Pharmacist (Chemist)	5 (6.8)	0 (0.0%)	5 (16.7%)	

Table 3: Living Conditions of women by type of slum housing in India, 2016.

Characteristics	Overall N (%)	Slum A N (%)	Slum B N (%)	p-value
Total Family Members (living in the household)				0.004
≤5	70 (52.2%)	44 (64.7%)	26 (39.4%)	
6-9	56 (41.8%)	20 (29.4%)	36 (54.6%)	
≥10	8 (5.9%)	4 (5.9%)	4 (6.1%)	
Number of Rooms in the house				0.01
1-2	125 (95.4%)	61 (91.0%)	66 (100%)	
≥3	6 (4.6%)	6 (8.9%)	0 (0.0%)	
Toilets				<0.001
Have Toilet at Home	45 (33.6%)	44 (64.7%)	1 (1.5%)	
Use Government Toilets	15 (11.2%)	15 (22.1%)	0 (0.0%)	
Open Defecation	72 (53.7%)	7 (10.3%)	65 (98.5%)	
Use Toilets somewhere else	2 (1.5%)	2 (2.9%)	0 (0.0%)	
Type of Stove for Cooking				<0.001
None	1 (0.75%)	1 (1.5%)	0 (0.0%)	
LPG	66 (49.3%)	65 (95.6%)	1 (1.5%)	
Kerosene and Wood/Cow Dung cakes	61 (45.5%)	1 (1.5%)	60 (90.9)	
Both LPG & Wood	6 (4.5)	1 (1.5%)	5 (7.6%)	

Table 4: Reproductive health and behavior of women living in slums in India, 2016.

	Overall N (%)	Slum A N (%)	Slum B N (%)	P-value
Type of Contraception				<0.001
Oral Contraceptive	3 (3.4%)	0 (0.0%)	3 (6.1%)	
Condoms	16 (17.9%)	7 (17.5%)	9 (18.4%)	
Had Tubectomy	26 (29.2%)	18 (45.0%)	8 (16.3%)	
IUD	6 (6.7%)	1 (2.5%)	5 (10.2%)	
Abstinence/Pull Out	38 (42.7%)	14 (35.0%)	24 (48.9%)	
History of Abortion				
Yes	27 (20.2%)	14 (20.6%)	13 (19.7%)	0.053
No	101 (75.4%)	51 (75.0%)	51 (77.3%)	
Number of Abortions				0.18
None	101 (75.4%)	51 (75%)	50 (75.8%)	
1	18 (13.4%)	12 (17.7%)	6 (9.1%)	
2	9 (6.7%)	2 (2.9%)	7 (10.6%)	
Feminine Product				0.0006
Sanitary Napkins	47 (36.2%)	30 (46.9%)	17 (25.8%)	
Cloth	70 (53.9%)	28 (43.8%)	42 (63.6%)	
Anemic				0.35
Yes	82 (61.2%)	39 (57.4%)	43 (65.2%)	
No	52 (38.8%)	29 (42.7%)	23 (34.9%)	



Figure 1: View of Slums at Rajiv Colony, Panchkula, India.



Figure 2: View of Slums near Mansa Devi Complex, Panchkula, India.

Discussion: This study was designed to compare women's reproductive health, behavioral health and living conditions in two different types of urban slums in India. We found significant differences in demographic characteristics of women by type of slum including the level of education, monthly household income, employment status, and occupation. In addition, we found significant differences in behaviors such as smoking, hand washing, and healthcare-seeking behavior. One reason for the difference in smoking status could be that some of the families living in Slum A were practicing Islam who are prohibited from smoking and consuming alcohol. Although most of the women in both kinds of slums self-reported using soap for hand washing after using the toilet, this might be an over-estimate. Based on our observation during the survey, it appeared that they said they wash their hands with soap because it is the right thing to do. The general view of hand washing behavior was different from the reported behavior.

This study found that the women in Slum B defecated in open areas because they did not have their own buildup toilets or mobile toilets provided by government agencies. One of the primary reasons for this was that slums like Slum B are illegal settlements. Despite the ongoing campaigns to provide free access to toilets to those in need, illegal settlements are not provided any sanitation facilities from the government. In addition, most of the households in Slum B had kerosene and wood stoves instead of the much cleaner LPG, Toxicological studies conducted on animals suggest that exposure to wood smoke can

depress macrophage activity, disrupt cellular membranes, destroy respiratory epithelial cells, and cause biochemical changes.¹⁰ Exposure to biomass fuels (e.g., wood/cow dung) is strongly associated with various lung diseases, including acute respiratory infections, chronic obstructive pulmonary disease (COPD), lung cancer, pulmonary tuberculosis, asthma, and interstitial lung disease.¹¹ There is a need to educate slum dwellers about the advantages of using LPG. Since these households are very small and made up of combustible material like bamboo, wood, and plastic, these localities are at a greater risk of catching on fire.¹²

The majority of women living in both the slum regions sought healthcare from quacks or fake healthcare provider, colloquially referred to as 'Bengali doctors' or 'Hakeem'. Surprisingly, the proportion of women seeking healthcare from quacks was higher among Slum A dwellers than Slum B dwellers. One reason could be that Slum B was near a Hindu Temple that runs an easily accessible, charitable hospital of alternative medicine. Also, some of the women had access to a nearby private clinic. Although we didn't collect data on the perceptions of women seeking healthcare at a government hospital, researchers asked women who sought care from quacks why they chose to go to them instead of the government hospitals. It was found that one of the major reasons was that government hospitals are usually very busy and it takes almost a full day to meet the physician. Women also complained that hospital staff are generally rude and non-cooperative. Most of the women believed that they are not treated well at the hospital because they are poor and uneducated. Some of the women believed that the hospital is too far when quacks are in the neighborhood and easier to see. The authors met a few quacks during visits to the slums. These quacks generally described themselves ayurvedic doctors with Bachelor's degrees in Ayurveda, Medicine, and Surgery (BAMS) and gave out allopathic medication to patients. Our findings were consistent with previous studies.¹³⁻¹⁵

A significant difference was found in the reproductive health of women in Slum A compared to Slum B. The majority of women in Slum A had undergone tubectomy to prevent pregnancy, while women in Slum B abstained from sex to prevent pregnancy. The reason for this could be that there was an *Anganwadi* in the center of Slum A and women were educated about family planning by healthcare workers. It was observed that women living closer to *Anganwadi* were much more aware of contraception methods than women who lived further away from it. On the other hand, a lesser percentage of women in Slum A report-

ed condom use by them or their partners. One of the reasons could be that married women didn't discuss family planning with their partners.¹⁶ Another reason could be that married men are uneducated about the correct use of a condom and its advantages. A study conducted in the same region by Bhatia et al. reported that 54.6% of the married men living in slums did not know the correct technique for condom use and about 37% were unaware about its benefits.¹⁷

This study also found that 63% of women in Slum B and 43.8% of women in Slum A used cloth during menstruation. The key reason for using cloth during menstruations is affordability. The Indian government's '*Total Sanitation Campaign*' is a national program to ensure access to improved sanitation. However, the program does not provide menstrual hygiene services to women. Although most of the women in this study reported that they do not reuse the cloth (data not shown), this may not be true for everyone. Previous studies have indicated that women living in slums or rural India re-use the cloth after washing.^{18,19} The cloth needs to be washed with soap and dried in sunlight to kill bacteria, but some women may not be able to do that because of the taboo associated with menstruation, lack of private toilets, or lack of access to clean water.^{18,20,21}

The present study is limited in several ways. Because the data was self-reported, some of the prevalence rates could be an underestimation or overestimation of the actual value. Also, selection bias could have occurred if women who participated in the study were either unemployed or were sick on the day of the interview.

Despite these limitations, this study has a number of strengths. This is a slum-specific study that highlights the health disparities and needs of two types of slums. Since the needs of people living in slums differ from the needs of people living in rest of the city, findings from this study could be used to make slum-specific interventions. This study also collects information on various factors that could eventually impact the health of women living in the urban slums.

CONCLUSION: To the best of our knowledge, this is the first study to compare slums based on housing type in Northern India. In summary, this study found significant differences in the behavioral health, living condition and reproductive health of women living in urban slums depending on the type of housing. Almost all women in Slum B did not have access to toilets and defecated in the open, which raised the question of privacy and safety in addition to sanitation and hygiene. We recommend that the government should at least provide illegal slum dwellers access to mobile

toilets because it would ultimately reduce the health burden on the healthcare system. Also, there is a need for sanitation awareness and hygiene education in slums. Women should be explicitly educated about menstrual hygiene and men in these regions should be taught the importance of condoms and how to correctly use them. Future studies should consider evaluating men and women's awareness and perception of contraception methods. Also, it might be beneficial if a healthcare practitioner could visit the slums once or twice a week and provide essential medication. This may reduce the burden on tertiary care physicians and prevent slum dwellers from seeking healthcare from quacks. In the future, studies should consider comparing the prevalent diseases in the urban-slums to those in the urban population.

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