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Publications

Jyoti S. Hallad and Suvarna K. Naikar (2022) "Reproductive Health Status of Adolescent Girls in India: A Hindsight after 75 years of Independence" in an edited book "Her Journey since 1947 and the Road Ahead" published by Drishti Stree Adhyayan Prabodhan Kendra, Pune pp. 97-104

Shriprasad H. and Suvarna K. Naikar (2022). "Consumption expenditure pattern of households with older adults in Karnataka; evidences from longitudinal ageing study in India (LASI)". Indian Journal of Economics and Financial Issues, Vol. 3, No. 2, 2022, pp. 279-292 ISSN: 2582-5186.

Seminar / Workshops / Training/Meetings attended by staff. Prof.Jyoti S. Hallad Director attended a meeting on PRC Activities under the Chairpersonship of DDG, MoHFW, GoI on 28.07.2022.

Prof.Jyoti S. Hallad, attended the meeting on Annual Work Plan of PRCs on 04.08.2022 organized by MoHFW, GoI, New Delhi.

Mrs. M.G. Hadagalimath, Research Investigator and Mr. S.R. Vatavati, Field Investigator attended the training workshop on 'National Guidelines for Data Quality in Surveys' during 17-18 August, 2022 organized by ICMR and National Institute of Medical Statistics under its initiatives National Data Quality Forum (NDQF) at Bengaluru.

Shriprasad H participated in Two Day National Orientation Workshop on Indian Public Health Standards, 2022 on 18-19 November 22 New at Delhi.

Prof.Jyoti S. Hallad, Director conducted a training programme for all PRCs on Methodology and Study Tools for PAN India studies; 'Menstrual Health and Hygiene among Adolescent Girls' on 14.12.2022 and 'Understanding the Context of C-section Delivery' on 16.12.2022.

Prof.Jyoti S. Hallad, Director attended and presented a paper on 'Determinants of Hypertension and Diabetes Mellitus among Older Adults and Elderly: Evidence from LASI' at 7th Knowledge Dissemination workshop of PRCs on 19-20 October, 2022 at University of Kashmir, Srinagar.

Dr Shriprasad H presented a paper 'Catastrophic Health Expenditure in Households with Older Adults: Some Insights from Longitudinal Ageing Study in India' at 7th Knowledge Dissemination workshop of PRCs on 19-20 October, 2022 at University of Kashmir, Srinagar

Major Activities of the Centre

Digital Population Clock was inaugurated by Dr. D. VeerendraHeggade, Chairman, Janata ShikshanaSamiti, Dharwad on 19.10.2022 Dr.Ajith Prasad, Secretary, JSS was also present.

Centre celebrated Swacchhatha Pakhawada to create awareness on avoiding the usage of non-biodegradable materials in collaboration with the Ministry of Petroleum and Natural Gas on 08.07.2022.

Centre organized Intellectual Property Awareness Programme under National Intellectual Property Awareness Mission on the occasion of Azadika Amrit Mahotsav in collaboration with Ministry of Commerce and Industry, Government of India on 20 & 21 July, 2022. Around 1800 students attended this awareness programme in 5 Sessions.

Dr.Jyoti S. Hallad, Director attended Editorial Board meeting of 'Demography India' as an Associate Chief Editor on 18.07.2022.

On the occasion of 75th Birthday of Pujya Dr. D. VeerendraHeggadeji, Chairman, Janata Shikshana Samiti, Dharwad, distribution of Notebooks was done by the sta on 24.11.2022. and Mega Health Check-up Camp was organized in collaboration with FPAI, Dharwad on 30.11.2022 in Narendra village. Total 152 individuals availed the services of gynecology check-up, eye and NCD check-up.

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ARTICLES

Contraceptive use and its determinants among Urban Slum Dwellers in India

Raj Narayan[1], Gudakesh[2], S. Ramachandra Rao[3] and Ajit Yadav[4]

Abstract

India has one of the largest urban populations in the world. The urbanization of different parts of the world constitutes a major demographic issue of the twenty-first century. This is especially true for India, where the urban population is assumed to be among the largest in the world. This study investigates the relationship between contraception use and the influences of different socio-demographic and cultural factors on contraceptive use among slum women in urban India. Individual women's data from the National Family Health Survey (NFHS-4) have been utilized for the study, conducted by the Indian Government, which is comparable to the Demography and Health Survey (DHS). Chi-square (2) tests were applied to examine the relationships between any contraceptive use, while multivariate binary logistic regression was used to analyse the effects of various socio-demographic and cultural factors on the "current use of contraceptive method." Besides, multivariate multinomial logistic regression analysis was performed to examine the relationship between contraceptive method choice and various socioeconomic and demographic factors. Findings show that overall contraceptive use among slum women was 45.9%, and the use of modern methods was 41.8%. Female sterilization was the most preferred method of contraception, followed by periodic abstinence and the pill. Women with male children are more likely to use contraception than female children. This may be explained by the fact that gender preference still prevails in the urban slums of India. In conclusion, women's age, education, religion, caste, number of living children, children who died, and children ever born are significant predictors of contraceptive use among slum dwellers. The sex of the child seemed to be one among the determining factor for the use of contraception. Socioeconomic status plays a significant role in determining the use of contraceptives in slums. According to the study, efforts should be made to educate slum dwellers, especially women. Door to door and free-of-cost delivery of modern methods should be strengthened to raise the prevalence rate of contraception among slum dwellers.

Keywords: Family Planning, Contraceptive Use, Modern Method, Contraceptive Method Mix, Slum

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Background

The urban population in India is one of the largest in the world. The urbanization of different parts of the world constitutes a major demographic issue of the twenty-first century. This is especially true for India, where it is estimated that the urban population is one of the largest in the world. Urban India has 28 percent of the national population and is predicted to increase to 33 percent by 2026 (John et al., 2008). The unprecedented growth in the urban population in India has also resulted in a large section of the population living in abject poverty in overcrowded slums. Globally, slums have been recognized as neglected communities with limited access to services. They are often characterized by deteriorated or poorly structured houses crowded together, poor environmental management, such as deficient access to safe drinking water and sanitation, stagnation of water, poor drainage with excessive open sewers, an excessive amount of uncollected rubbish, severe overcrowding, flies, and poor lighting (Sclar et al., 2005; Harpham,1986). These settings are compounded by inhabitation by a migratory population living under stressful conditions.

In India, there has been an alarming increase in the slum population mostly due to the migration of the rural poor people in search of employment or better opportunities. It has been reported that the total slum population in India has doubled in the past two decades and has risen from 27.9 million in 1981 to 42.6 million in 2001. According to the 2001 Census, 640 cities and towns in India reported slums and the total slum population comprised around 23 percent of the total urban population of the States/UTs reporting slums (Census of India 2001). Now according to 2011 census, 65.5 million populations were living in slums in India. This constituted 17 percent of the urban population of the States/UTs in 2011 (Census of India 2011).

Slums have often been conceptualized as social clusters that engender a distinct set of health problems (Khan and Kraemer, 2008). The poor environmental condition coupled with high population density makes them a major reservoir for a wide spectrum of adverse health conditions such as under nutrition, delivery-related complications, postpartum morbidity, and etc (Mony, 2006;Agrawal & Bharti, 2006;Aggarwal et al., 2007).In India, there have been limited efforts to study the health of individuals especially women living in slums. India has

experienced historic increase of contraceptive use and a sensational decline in fertility over the last three decades. The fertility has decreased from 5.2 births in the 1971to 2.3 births per woman in 2016 (https://tradingeconomics.com) and contraceptive use rate has increased four times from 14 percent in the 1971 to 54 percent in 2016 (IIPS and ICF, 2017). This progress in population control programs in India has been well documented with testimony at home and abroad. Although consecutive Demographic Health Surveys conducted in India continually showed that the contraceptive prevalence rate (CPR) was higher in urban than rural areas; however, little is known about contraceptive use patterns among slum dwellers. The rapid growth of the population in informal settlements and urban squatters suggests the urgent need to drive up the understanding of contraceptive use and method choice in urban slums. The Present study aims to examine the association between any contraceptive use and the effects of various socio-demographic and cultural factors on the current use of contraceptive method among women living in the urban slums of India.

Methodology

Data

This study utilizes individual women's data from fourth round of the National Family Health Survey (NFHS-4), an Indian government survey equivalent to the Demography and Health Survey (DHS). National Family Health Survey (NFHS) periodically collects data from population based nationally representative, cross-sectional survey using a systematic, two-stage, cluster sample of households. The NFHS-4 interviewed 699,686 women aged 15-49 years, living in 601,509 households, across all Stats/UTs of India. In the survey, data on urban slums were collected from six cities in India, including the four major metropolitan cities. Areas designated as slums in the 2011 Census were used as the survey sample. Further details of survey procedures and sampling of the NFHS-4 were published in the survey report (IIPS and ICF, 2017).Structured questionnaires were administered, and a 5-year retrospective pregnancy history was obtained from women aged 15–49 years.

Study Variables and Methods of Analysis

The study deals with current use of contraception and determination of choosing modern or traditional method over non-use. The modern methods included in this study are pill, IUD,

injectable, condom, female and male sterilization, while the traditional methods are withdrawal, periodic abstinence or rhythm. Dependent variables were categories in two parts. In the first part a binary response was created for current use of contraception. If a woman was currently using any contraceptive method, she was coded as '1' and '0' for otherwise. For the second part, the response was grouped into 'Using Traditional Method', Using Modern Method' and 'Not Using Any Method'. Independent Variables also categorised like age (15-19, 20-24, 25-29, 30-34, 35-39,40-44, 45-49), Education (No education, Primary**,** Secondary, Higher), Religion (Hindu, Muslim, Others: - in others category Christian, Sikh, Jain, Buddhist/Neo-Buddhist, etc. are included), Caste **(**Others, OBC, Schedule Caste, Schedule Tribe, in some places Schedule Caste, Schedule Tribe are included as Schedule Caste/Schedule Tribe), Sex of Child (Male, Female**),** No. Living Children (0, 1-2, 3-4, 5+), Children died (None, One+) and Wealth Index or SES (Low, Middle, High).

Chi-square (χ^2) tests were applied to examine the association between any contraceptive use, while multivariate binary logistic regression was applied to examine the effects of various socio-demographic and cultural factors on the 'current use of contraceptive method'. Besides, multivariate multinomial logistic regression analysis was performed to examine the relationship between contraceptive method choice and various socioeconomic and demographic factors. The results of the regression analyses have been presented by odds ratios (ORs) and relative risk ratio (RRR) with 95 percent confidence interval (CI). The data has been analysed by STATA software.

Results

Background profile of the Respondents

Table 1 presents the background profile of the women of urban slums in India. The mean age of the women was 30.1 (SD ± 9.8) years. The mean number of living children and the mean number of children ever born were 1.67 (SD±1.6) and 1.76 (SD±1.7), respectively. It is also found that approximately 32 percent of women have no children. About 46 percent of women were using any contraceptive methods in the urban slum in India. Among them, 42 percent and 4 percent of women used modern and traditional methods, respectively.

Table 1: Background Profile of the Women of Urban Slum in India, 2015-16

Characteristics	Mean± SD or percentage
	Slum
Mean age	30.1±9.8
Mean number of living children	1.67±1.6
Mean no. of children ever born	1.76±1.7
Women without having children	31.70
Currently using any contraceptives	45.81
Currently using modern contraceptives	41.76
Currently using traditional method	04.05

Table 2 shows the percentage distribution of currently married women in urban slums by socio-demographic background characteristics. Most of the women (18.6%) were in the age group of 20-24 years, followed by 25-29 years (17.7%), 30-34 years (15.8%) years and 15-19 years (13.4%. Less than half (48.9%) of women had secondary education. About 24 percent of women had no formal education. Only 15 percent and 12 percent of women had higher and primary education, respectively. The vast majority (74.5%) of women were Hindu, and about 23 percent were Muslim. About 47 percent of women belonged to the OBC, followed by 31 percent of schedule caste, 21 percent of others caste and 4 percent of schedule tribe. About 57 percent and 53 percent of women had male and female children. About 45 percent of women had 1-2 living children, 30 percent had no living children, 21 percent had 3-4 children, and 4.4 percent had 5+ children. Most women (94%) had no experience of child death, while 6 percent had experienced more than one child death. Regarding the socio-economic status of the household, about 72 percent were rich, 22 percent were middle class, and 6 percent of women were found to be poor.

Table 2: Percentage distribution of Currently Married Women by Socio-demographic Characteristics of Urban Slum Dwellers in India, 2015-16

Background characteristics	Percent	Number
Age		
15-19	13.4	444
20-24	18.6	618
25-29	17.7	588
30-34	15.8	523
35-39	12.9	428
40-44	11.6	385

45-49	10.1	336
Education		
No education	23.7	787
Primary	12.4	412
Secondary	48.9	1624
Higher	15.0	499
Religion		
Hindu	74.5	2473
Muslim	23.0	764
Others	02.5	85
Caste		
Others	20.8	670
OBC	44.6	1436
Schedule Caste	31.1	1000
Schedule Tribe	03.5	114
Sex of Child		
Male	57.3	1,904
Female	42.7	1,418
No. Living Children		
0	29.7	986
1-2	44.8	1487
3-4	21.1	702
5+	4.4	146
Children died		
None	94.0	3,123
One+	06.0	199
Total Children Ever Born		
0	29.5	981
1	15.9	526
2	26.8	889
3+	27.9	925
Wealth Index		
Low	06.2	207
Middle	21.5	715
High	72.2	2399

Differentials of Contraceptive Use and Method Choice

Table 3 shows the variations in contraceptive use and method preference among Indian urban slum women who are currently married. A significant amount of contraception was used by about 19% of women aged 20–24, followed by 18 percent of women aged 25–29, 15percent of women aged 15–19, 14percent of women aged 30-34, 13percent of women aged 35–39,

11percent of women aged 40–44, and 10percent of women aged 45–49. Use of the modern method was higher (21.4%) among women aged 30-34. The traditional method use rate was higher among the women aged 25-29. Significant secondary educated women (50.4%) were using any contraception. The use of modern and traditional methods was higher among women with secondary education (47.8%) and no education (43.1%), respectively. Hindu women (69.9%) reported higher use of contraception than Muslims (27.4%) and others (2.7%). The same pattern was observed in the case of modern and traditional methods. The practice of contraception and use of modern and traditional methods among the OBC were higher than the schedule caste/schedule tribe and others.

Contraceptive use was significantly higher among women with a male child (56.3%) than a female child (43.7%). The same picture had depicted in the case of modern and traditional methods. Approximately 47 percent of women with 0-1 living children were using any contraception, followed by 41 percent of those with 2-3 living children and 12 percent having 4+ children. However, women with 2-3 living children preferred more modern and traditional methods compared to women with 4+ and 0-1 living children. Children ever born were significantly associated with contraception practice. As expected, women with no CEB showed the lowest use of modern and traditional contraceptive methods compared to other categories of CEB. Rich women (77.9%) were using higher contraceptives compared to the middle (16.7%) and poor women (5.4%). The same pattern showed in modern and traditional methods.

Table 3: Percentage Distribution of Currently Married Women Using Contraceptive by Background Characteristics of Urban Slum Dwellers in India, 2015-16

Background Characteristics	Using Contraceptive by Methods			Total Users	$\chi 2$
	No	Traditional	Modern		
Age					787.8***
15-19	25.7	01.7	00.8	15.0	
20-24	26.9	12.6	07.6	18.8	
25-29	16.7	24.1	18.7	17.8	
30-34	09.3	17.8	21.4	14.4	
35-39	07.4	18.4	19.5	12.6	
40-44	06.6	12.6	17.7	11.1	
45-49	07.5	12.6	14.4	10.4	

Education					156.0***
No education	16.8	43.1	28.6	22.7	
Primary	11.2	10.3	14.9	12.6	
Secondary	53.3	37.4	47.8	50.4	
Higher	18.7	09.2	08.7	14.4	
Religion					61.7***
Hindu	69.0	50.6	73.8	69.9	
Muslim	28.8	48.3	22.4	27.4	
Others	02.2	01.2	03.8	02.7	
Caste					02.3
Others	20.7	18.7	18.7	19.9	
OBC	47.7	47.0	48.5	48.0	
SC/ST	31.6	34.3	32.7	32.1	
Sex of Child					983.1***
Male	32.7	77.6	88.3	56.3	
Female	67.3	22.4	11.8	43.7	
No. Living Children					22.09***
0-1	54.6	04.0	13.4	47.0	
2-3	21.8	45.4	69.8	41.3	
4+	06.6	28.7	16.8	11.7	
Children died					78.2***
None	96.3	82.2	90.4	93.3	
One+	03.7	17.8	09.6	06.7	
Total Children Ever Born					26.1***
0	54.3	3.5	01.4	31.4	
1	16.8	21.8	11.2	14.9	
2	14.2	24.1	42.2	25.4	
3+	14.8	50.6	45.2	28.3	
Wealth Index					11.7**
Low	04.5	08.6	06.2	05.4	
Middle	16.4	21.3	16.6	16.7	
High	79.0	70.1	77.2	77.9	
Total	**1,880**	**174**	**1,268**	**3,322**	
χ2 significant level *** at the 0.01 level, ** at the 0.05 level					

Contraceptive Method Mix

Table 4 shows the percent distribution of urban slum women by contraceptive method mix in India. It can be seen that female sterilisation (32.8%) was the most popular form of modern contraception, followed by condoms (5.5%), pills (2.9%), IUDs (0.4%), injections (0.1%), and male sterilisation (0.06%). The use of modern methods was about 42 percent. Only 4

percent of women were using any traditional methods, in which rhythm/periodic abstinence (3.4%) was the most preferred method, and the prevalence of withdrawal (0.7%) was significantly less.

Table 4: Percentage Distribution of Currently Married Women by Contraceptive Method Mix of Urban Slum Dwellers in India, 2015-16

Contraceptive Method Mix	Percent	Number
Not using	**54.19**	**1,800**
Any Modern Methods	**41.76**	**1387**
Pill	02.89	96
IUD	00.44	15
Injections	00.14	5
Condom	05.48	182
Female sterilization	32.75	1088
Male sterilization	00.06	2
Any Traditional Methods	**04.05**	**134.45**
Rhythm/Periodic Abstinence	03.40	113
Withdrawal	00.65	22
Using Any Method	**45.81**	**1522**

Factors Affecting Contraceptive Use

Table 5 presents the determinants of contraceptive use among currently married women. It is found that the age of women is a significant predictor of contraceptive use. Women aged 30-34, 35-39 and 40-44 were two times more likely (OR=1.98, $p<0.10$, OR=1.99, $p<0.10$ & OR=1.98, $p<0.10$) to use any contraceptive as compared to women of aged 15-19. Women from other religions were 1.82 times more likely (OR=.1.82, $p<0.10$) to use contraceptives than Hindu women. The likelihood of contraception use was 51 percent (OR= 0.49, $p<0.01$) lower among women with a female child than those with a male child. Those women with 2-3 and 4 and more living children were 2.8 times and 2.4 times more likely (OR=2.80, $p<0.05$, OR=2.37, $p<0.10$) to use contraceptives compared to those having 0-1 living children. Children ever born showed a significant effect on contraceptive use. Women having one, two and three and more CEB were 13.7 times, 14.7 times and 15.9 times more likely (OR=13.66, $p<0.01$, OR=14.77, $p<0.01$& OR=15.89, $p<0.01$) to use contraceptive as compared to those having no CEB.

Table 5: Factors Affecting of Contraceptive Use of Currently Married Women of Urban Slum Dwellers in India, 2015-16

Background characteristics	Odds ratio	95% Confidence Interval	
		Lower	Upper
Age			
15-19 ®	1.00		
20-24	1.13	0.55	2.32
25-29	1.77	0.86	3.63
30-34	1.98*	0.94	4.13
35-39	1.99*	0.95	4.19
40-44	1.98*	0.93	4.20
45-49	1.21	0.57	2.57
Education			
No education®	1.00		
Primary	0.93	0.69	1.25
Secondary	1.13	0.89	1.45
Higher	0.86	0.60	1.24
Religion			
Hindu®	1.00		
Muslim	0.98	0.77	1.25
Others	1.82*	0.98	3.39
Caste	1.00		
Others®			
OBC	1.09	0.86	1.39
SC/ST	1.15	0.88	1.52
Sex of Child			
Male®	1.00		
Female	0.49***	0.38	0.63
No. Living Children			
0-1®	1.00		
2-3	2.80**	1.13	6.95
4+	2.37*	0.91	6.18
Children died			
None®	1.00		
One+	1.14	0.80	1.63
Total Children Ever Born			
0®	1.00		
1	13.66***	7.77	24.00
2	14.72***	5.09	42.53
3+	15.89***	5.21	48.47
Wealth Index			
Low ®	1.00		
Middle	0.82	0.53	1.26
High	0.81	0.54	1.22
Constants	0.04***	0.02	0.08

® is the reference category, significant level *** at the 0.01 level, * at the 0.10 level

Determinants of Contraceptive Method Choice

Table 6 shows the determinants of traditional and modern contraceptive use among currently married women living in the urban slum by background characteristics. Although age was not found to have a significant effect on traditional method choice over the non-use of contraception; however, it appeared to be a significant predictor in modern method preference. The relative risk of utilizing modern methods among women aged 30-34 (RRR=2.048, CI=0.902-4.648), aged 35-39 (RRR=2.024, CI=0.887-4.617) and aged 40-44 (RRR=2.098, CI=0.912-4.822) were more compare to a woman aged 15-19. The women who had primary education were less using the traditional method than their no-education counterparts (RRR=0.579, CL=0.321-1.047). The relative risk of using traditional methods was found more among Muslim women compared to Hindu (RRR=2.804, CI=1.800-4.367). The risk of using modern methods among other religious women increased by a factor of 2.02 (CI=1.069-3.822) compared to Hindu. Furthermore, in comparison to women who belong to other castes, scheduled caste/scheduled tribe women had more chances of utilizing the traditional methods. (RRR = 2.152, CI = 1.235-3.749). The relative risk of utilizing the modern method is lower among women with a female child than those with a male child. (RRR = 0.442, CI = 0.339-0.577).

The risk of using traditional and modern methods increased with the number of living children. The relative risk ratio of modern methods was higher among women having 2-3 numbers of living children compared to women with 0-1 living children (RRR=2.490, CI=0.974-6.370). The risk of utilizing the traditional method significantly improved among women with one or more than one child died compared to women with no child dead. (RRR = 2.026, CI= 1.186-3.461). Total Children Ever Born shows the significant effect on traditional and modern method choice over non-use of contraception, the relative risk of utilizing traditional (RRR=19.300, CI=6.400-58.204) and modern methods (RRR=12.918, CI=6.833-24.422) were more among women those have one CEB. In addition, the utilization of modern methods was also higher for those with two and three or more than three CEB compared to those with no CEB (RRR=17.781, CI=5.777-54.726 & RRR=19.406, CI=5.972-63.061).

Table 6: Determinant of Traditional and Modern Contraceptive Use among Currently Married Women of Urban Slum in India, 2015-16

Background characteristics	Traditional vs. Non-use			Modern vs. Non-use		
	RRR	95% Confidence Interval		RRR	95% Confidence Interval	
		Lower	Upper		Lower	Upper
Age						
15-19 ®	1.00			1.00		
20-24	1.20	0.30	4.78	1.10	0.50	2.46
25-29	1.80	0.45	7.31	1.77	0.79	3.94
30-34	1.47	0.35	6.22	2.05*	0.90	4.65
35-39	1.65	0.39	7.02	2.02*	0.89	4.62
40-44	1.16	0.27	5.09	2.10*	0.91	4.82
45-49	0.76	0.17	3.38	1.26	0.55	2.92
Education						
No education®	1.00			1.00		
Primary	0.58*	0.32	1.05	1.00	0.98	0.73
Secondary	0.78	0.50	1.23	1.21	0.15	0.93
Higher	0.80	0.40	1.61	0.88	0.52	0.61
Religion						
Hindu®	1.00			1.00		
Muslim	2.81***	1.80	4.37	0.81	0.63	1.05
Others	0.48	0.06	3.73	2.02**	1.07	3.82
Caste						
Others®	1.00			1.00		
OBC	1.15	0.72	1.83	1.08	0.53	0.84
SC/ST	2.15***	1.24	3.75	1.07	0.66	0.80
Sex of Child						
Male®	1.00			1.00		
Female	0.85	0.53	1.37	0.44***	0.34	0.58
No. Living Children						
0-1®	1.00			1.00		
2-3	4.39	0.51	37.54	2.49*	0.97	6.37
4+	6.10	0.67	55.23	1.98	0.74	5.31
Children died						
None®	1.00			1.00		
One+	2.03***	1.19	3.46	1.01	0.70	1.46
Total Children Ever Born	1.00			1.00		
0®						
1	19.30***	6.40	58.20	12.92***	6.83	24.42
2	5.83	0.53	64.00	17.78***	5.78	54.73
3+	7.03	0.58	85.14	19.41***	5.97	63.06
Wealth Index						
Low ®	1.00			1.00		
Middle	0.82	0.40	1.70	0.81	0.52	1.27
High	0.77	0.39	1.52	0.81	0.53	1.23
Constants	0.00***	0.00	0.02	0.03***	0.01	0.08

® is the reference category, significant level *** at the 0.01 level, ** at the 0.05 level* at the 0.10 level

Discussion and Conclusion

This study investigates the relationship between contraception use and the influences of different socio-demographic and cultural factors on contraceptive use among slum women in urban India. More than 17 percent of Indian urban residents live in slums, yet little attention has been paid to their use of contraceptive behaviour. The principal contribution of this studyis to increase understanding of contraceptive use and method choice among urban poor living in slums using a nationally representative survey. The finding of the present study reveals that 46 percent of women who reside in the slum used contraception overall. The percentages of modern and conventional methods used were 42 percent and 4 percent, respectively. According to the NFHS-4, 56 percent of Indian women used contraceptives in 2015-16; the prevalence of modern and traditional methods was 49 and 7 percent, respectively, while 44 percent of women of reproductive age did not use any method (Dey, 2019).With regard to the contraceptive method mix, female sterilization is the most preferred method, followed by periodic abstinence and pills. The low prevalence of condom uses and male sterilization make it clear that men have hardly any responsibility for family planning. IUD/PPUID, injection, and withdrawal methods were also lower in India's urban slums.

The results suggest that older women were more reluctant to use contraceptives than their younger counterparts. Although age and the use of traditional methods were not significantly correlated, younger women in their prime reproductive years were significantly more likely to use modern methods than older women. The findings confirmed that women's education has the most noticeable impact on contraceptive use. The finding reveals that the practice of modern methods is more prevalent among women with secondary education.

Women with higher levels of education may be more knowledgeable about modern methods and their side effects. Additionally, it has been observed that caste and religion are significantly related to the use of family planning methods. A higher proportion of Hindu women use contraceptives than Muslims and other religions. Similar to the present study, also explained that more Hindu women than Muslims used family planning methods (Koringa et al., 2015). The use of contraceptive methods among OBC is higher than schedule caste, general and schedule tribe.

Number of living children and child mortality are also two determinants factors of contraceptive use. The use of contraceptive increased with the increase of number of living children. The similar finding found in Pandey study, in his study noted that there was an increase in the prevalence of contraceptive use with the increase in the number of living children (Pandey, 2011).A woman is more likely to use contraception if she has two or more living children. According to this finding, women with two living children want to delay or limit childbearing. Additionally, it shows how strongly motivated Indian slum women are today to have a family size of two children. It has been observed that as infant mortality increased, contraception use decreased. This may be because the women who experienced child mortality are likely to replace the lost child immediately with another one, resulting in lower use of any method and modern method adoption.

The most significant predictor of the use of contraceptives appeared to be sex preference, particularly a son over a daughter. Compared to women with female children, those who have male children are more likely to use contraception. This may be explained by the way that gender preference is still prevailing among slum women in India. One study also reveals a reduction in son preference effects on contraception and fertility with increasing levels of women's education and household economic conditions, particularly in the three regions where son preference effects are most substantial (Arokiasamy, 2002; Singh and Gudakesh, 2022). When the wealth index is closely examined, it becomes clear that poor women are more likely to use family planning methods. This is explained by the fact that wealthy women in urban slums are less likely to use contraceptives than poor women because they are more reluctant to add to their families.

In conclusion, women's age, education, religion, caste, number of living children, children who died, and children ever born are significant determinants and show a highly significant relationship with the use of contraceptives in the Indian slum population. The only factor that determined whether or not to use contraception seemed to be the sex of the child. The use of contraceptives in India's urban slums is also significantly influenced by the wealth index.

The findings of the study suggest that focused efforts need to be made to educate the slum dwellers, especially the women. This study also highlights that Muslims and other religious community: Christians, Jain, Buddhist/Neo-Buddhist, etc. needs more attention towards family planning practices. Further, this study suggests adequate steps such as more advocacies on raising the awareness in implementing the family planning practices so as to reduce the child mortality/morbidity in slum dwellers. It is also advised men to encourage for using the condoms not only for birth control and also for not infecting themselves and also not transmitting the HIV/AIDS, and other sexually transmitted diseases to others. In addition, to increase the awareness about use of modern contraceptive methods, door-to-door and free services of modern methods should be strengthened and made available.

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The Ecofeminist Understanding of the effects of Menstrual Waste on Environment in India

Heena Mishra[1] and Smridhi Kaushal[2]

Abstract

Menstruation is unique to women and transgender men, affecting them directly or indirectly. Its management is subjective to a woman's socio-cultural and economic position. In this paper, 'menstruation' and 'menstrual management' are examined from an eco-feminist perspective. The paper offers a theoretical insight to evaluate the impact of heedless disposal of menstrual waste on environmental contamination in India. Additionally, an attempt has been made to analyse the dynamics and underlying forces that act behind its multiplication. The substantial growth of menstrual waste (such as sanitary napkins and tampons) that majorly consists of single-use plastic is considered a threat to the environment. Further, the present paper discusses implications of policies and programmes for menstrual waste disposal and reflects upon the measures for sustainable menstrual management.

Keywords: Sustainable environment, menstrual management, ecofeminism

Introduction

Menstruation is a unique biological phenomenon, marked by quintessential physiological changes in women and transgender men's life. It is impacted by health (biological status, knowledge and awareness), social milieu (safety issues, socio-cultural practices, learned behaviour) and economic constraints (availability and affordability of resources). Menstrual Hygiene Management (MHM) is subject to the socio-cultural and economic standing of the menstruating individuals.

The advent of sanitary pads has, to an extent added comfort and ease to menstruators for menstrual management, however, it has burdened the environment with the bulk of plastic

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waste. The plastic footprints of sanitary pads, tampons and other non-biodegradable menstrual products are creating havoc on the environment. Further, negligence towards proper disposal of menstrual waste has exacerbated the environmental challenges due to the non-biodegradable one-time-use plastic (mainly polyethene or polypropylene) in most sanitary napkins and tampons.

The plastic used in sanitary pads takes centuries to decompose, causing adverse health and environmental hazards (Zehra, 2018). Bulks of plastic waste generated by the use of non-biodegradable menstrual hygiene products swamp garbage dumping sites, and due to the pathogens[3] in menstrual blood and unsegregated bio-hazardous menstrual waste, it becomes a threat to sanitation workers and those working at dumping yards. The reckless disposal of used sanitary napkins in the dumping ground, and unsegregated and untreated menstrual waste pollute the biome. As a result, menstrual waste has become a palpitating concern for environmentalists and ecofeminists.

Ecofeminism[4] is a branch of feminism that studies connections between women and nature. The feminist perspective on menstruation goes back to the 'third wave' of feminism which is dedicated to menstrual activism. However, feminists hold different views on menstruation and menstrual management as they belong to diversified branches of feminism (Bobel, 2010). The feminist perspective was built on the conceptual, thematic, and ideological grounds to mainstream women while ensuring equal rights for them in social, cultural, political and economic spheres. The successive feminist waves addressed the contemporary needs of the society, starting from the campaign for women's suffrage and laying the foundation of gender equality in the first and second-wave of feminism. The third wave of feminism carried forward the ideologies of second-wave feminists to include the reproductive and sexual health of women. The focus was on individualism and diversity, broadening the ambit of feminism. It paved the way for reproductive rights, providing bylaws for medical termination of pregnancy, right to menstrual health and wellbeing of women. Third-wave feminism was

[3]A bacterium, virus, or other microorganism that can cause disease.

[4]According to Webster Dictionary Ecofeminism refers to a movement or theory that applies feminist principles and ideas to ecological issues

making a shift to an extension of existing issues raised by second-wave feminists to include intersectionality, transfeminism, postmodern feminism and ecofeminism to its credit. The issue of environmental degradation is deep rooted and compasses the range of feminism but menstrual waste can be viewed under the contours of ecofeminism as it identifies the present and future problems. It further provides sustainable solutions to the environmental problems, making it progressive and evolving theory as Warren (2002) points out ecofeminism is "always theory-in-process." Ecofeminism has a history way back to earlier times in the twentieth century, in different forms of "women-nature" connections. The term "*ecological feminisme*", (translated in English as ecofeminism) was coined by the French feminist Françoise d'Eaubonne[5] in 1974, to highlight, that women will bring about an ecological revolution. Since then, the advocates of ecofeminism have been debating, to provide a sustainable solution to maintain an ecological balance. Following Carlassare (2000), "Ecofeminism is a social movement and forms a theoretical enquiry that resists formations of domination and seeks to construct a politics for planetary survival and social egalitarianism." From a theoretical perspective, 'menstruation' and 'menstrual management' link with 'ecofeminism'. But the nature of this relationship with both menstruation and menstrual management differs in a practical approach. 'Menstruation', affects a segment of the female population and transgender men, whereas, 'menstrual management' is an ecological concern that affects and reflects on the environmental sustainability[6], and affects individuals belonging to the marginalized sections of the society.

Menstrual waste: an alarming issue

The pad revolution in India paced up ever since the study "Sanitary protection: every women's health right" conducted in 2010 by A.C. Nielsen (which is currently digitally unavailable) highlighted period poverty and revealed that 88 per cent of Indian women are using cloth, rags, ashes, or nothing at all for menstrual management which have been rebutted

[5]She was a French author and feminist. Her 1974 book Le Féminisme ou la Mort introduced the term ecofeminism.

[6]Environmental sustainability is **responsibly interacting with the planet to maintain natural resources** and avoid jeopardizing the ability for future generations to meet their needs.

through the national statistical agencies. The study further explains that twelve per cent of women in India have access to menstrual absorbents (Fodge, 2015). This single study had numerous rounds of citation in various other studies and reports (Sridhar, 2019) but not much emphasis was ever given to sustainable ways of menstrual management or the need for shift from non-biodegradable absorbents to biodegradable menstrual absorbents till recently.

Under National Health Mission being run in various states of India, distribution of pads in *Anganwadi* and government schools at low price of ₹ 1/- per sanitary pad (Freedays) was initiated (Ministry of Health and Family Welfare, 2016). As a result, many girls and women in India, for the first time, were introduced to commercial sanitary napkins.

This led to the refutation of age-old methods like the use of cloth, ash, leaves and other archaic methods as a means of menstrual management. National Family and Health Survey (NFHS)-4, in 2015-2016, recorded that 57.6 per cent of women aged between 15-24 years used locally prepared napkins, sanitary napkins, menstrual cups or tampons in India. Whereas, the use of such absorbents drastically increased to 77.3 per cent in the NFHS-5, (2019-2021) report. NFHS-4 data also revealed that a total of 59 per cent of the urban population use menstrual absorbents whereas, NFHS-5 reported 89.4 per cent of the urban menstruating population use protection methods during menstruation. Further, NFHS-5 confirmed higher use of menstrual absorbents by rural population (72.3%) as compared to NFHS-4 data which recorded that only 34 per cent of rural women use methods for menstrual protection. This data asserts an increase in use of hygienic methods of menstrual management. Nevertheless, the increasing burden of menstrual waste on the environment too manifests with it. According to Bhatiya (2018) every month, around 353 million women and girls in India use sanitary napkins that generate 44,125 million kilograms of menstrual waste. Such voluminous menstrual waste poses a serious threat to the environment and acts as a potential barrier to achieving a sustainable environment, that is pivotal to gender and development and, is one of the seventeen stated Sustainable Development Goals (SDG). Keeping SDGs under consideration, the rise of menstrual waste does not merely affect the environment; rather it cuts across each individual's life in some way or other. The

incinerators[7] for treatment of menstrual waste cause— air pollution and health hazards, by releasing toxic fumes and dioxins (Rushbrook and Zghondi, 2005). These dioxins, when come in the direct contact with humans may cause numerous risks. According to World Health Organization (2019), "Human exposure to dioxins and dioxin-like substances has been associated with a range of toxic effects, including chloracne; reproductive, developmental and neurodevelopmental effects; immunotoxicity; and effects on thyroid hormones, liver and tooth development." SDGs corresponding to good health and wellbeing, quality education, gender equality, clean water and sanitation, decent work and economic growth; sustainable cities and communities, responsible consumption and production, climate action, life below water and partnership to achieve the goals, are directly related to menstrual management and environment. Thus, passing on an environment worth living for future generations is the onus on the current generation.

Ecofeminist approach on menstrual management

Ecofeminism propounds, that women have a keen understanding of the natural environment and are sensitive to it; therefore, they develop a connection with plants, water, river, air, land, fire, sun etc. Due to this base, Salleh (1993) argues "Ecofeminism, like deep ecology, is concerned about the oppression of all life forms." Another source of constant comparison between the two comes from the fact that both nature and women have been facing a constant struggle in restoring their basic rights, which has been an evolving subject for feminist, activists, and scholars. According to Gates (1996), the destruction of nature, as posited by d'Eaubonne, "can only be realised by ecological and feminist parties which would allow society to get into a post-industrial era." Feminists such as Ruether (1975), Mies (1987), King (1989), Shiva (1989), Salleh (1993) and Mellor (1992, 2000, 2003) have been vocal about the issues germane to their natural environment but unfortunately, their voices have remained "underrepresented" (Thompson, 2006). Despite valiant efforts, women's movements and

[7] an apparatus for burning waste material, especially industrial waste, at high temperatures until it is reduced to ash.

feminists across the world are still struggling to form a 'collective conscious' [8] against environmental degradation. As opined by Carlassare (2000), "Ecofeminism recognizes that ecological problems are social and cultural problems." Hence, an understanding of environmental degradation can be drawn from a cultural ecofeminist perspective.

Cultural ecofeminism views women's biology through a cultural viewpoint by "constructing their own identities" (Twine, 2001). According to Haralambos and Holborn (2013), cultural ecofeminism emphasizes women's biology and biological processes like menstruation, conception, birth and lactation where "… the highest value is placed on culture than on nature". Similarly, Ortner (1974) opines that, women are closer to nature than men, due to their biological functions such as menstruation, conception, childbearing and lactation. Thus, cultural ecofeminism anchors women as a partner to nature by sharing the same roles and responsibilities as that of bearing and rearing, satisfying others. Ecofeminists have been constant in examining the relationship between patriarchal capitalism and the victimization of women and environmental reforms. They believe that women and nature are exploited immensely under the capitalist system (Salleh, 1993). As Ortner, Warren, Salleh, Ruether and many more ecofeminists point out, exploitation of nature and women is caused due to the oppressive patriarchal practices and the control of men over the natural environment as well as domination over women.

Sanitary pads have greatly contributed to women's struggle against establishing a ground in the men dominating world and setting themselves free. As Salleh (1993) puts it "the freedom of some is always enjoyed at the expense of others." Therefore, the consumption of sanitary napkins by a large number of women generates the bulk of menstrual waste in the environment. The course to bring a balance to the environment would need a paradigm shift. This requires a collective action from women to switch from commercial sanitary napkins to other available options, which would maintain equilibrium between the environment and menstrual hygiene needs. But the question is— will women make a collective endeavour to

[8]Defined by Émile Durkheim as 'the body of beliefs and sentiments common to the average of members of a society', it comprised a form and content which varied according to whether society was characterized by mecha nical or organic solidarity.

address their need for personal hygiene in congruence with the need for environmental concern?

Majority of India's menstruating population hails from rural areas that have started using both commercial and locally prepared pads but with less or no knowledge of use and its disposal. In urban India, on the other hand, where the use of sanitary pads is high, health complications are also visible. Contact with the chemicals used in pads has yield negative effects such as pelvic inflammation, cervix cancer, diabetes, weak immune system, and impaired fertility (Masoodi, 2017). In case of rural women, such health issues majorly go unaddressed due to a culture of silence[9] and shame, which further impose risks on their reproductive health. "Even though all the leading brands in the Indian sanitary market are global ones and sell the same products worldwide, the quality of the chemicals used in India is believed to be inferior." (*ibid.*). Moreover, in the absence of knowledge regarding the use and disposal of sanitary pad, women often use the pad for a longer time and thus, get exposed to infections like skin irritability, rashes, itching, burning sensation and reproductive tract infections (RTI) (Oreya,2021). According to District Level Household and Facility Survey [DHLS], (2007-08) rural women are more vulnerable to experience reproductive tract infection (RTI) as compared to urban women. The plastic used in sanitary pads restricts the air; as a result, such infections are common symptoms among women. Therefore, it is vital to understand that there cannot be a standard tool for menstrual management for such socially, economically and culturally diversified population.

Past few years, the profit-making business ventures and capitalists have taken over the femcare menstrual absorbent market and flooded it with commercial sanitary pads that include toxics and plastics. The modern capitalist system, manipulate menstruators by handing out non-biodegradable sanitary pads as the most viable solution to MHM. With the evolving need of women for cost-effective, clean and sustainable menstrual protection

[9]According to Freire, the system of dominant social relations creates a culture of silence that instills a negative, silenced and suppressed self-image into the oppressed. The learner must develop a critical consciousness in order to recognize that this culture of silence is created to oppress. Also, a culture of silence can cause the "dominated individuals lose the means by which to critically respond to the culture that is forced on them by a dominant culture."

methods, the capitalisation of 'femcare' products has been casting away the non-commercial options of menstrual management. Additionally, media, through various advertisements, posts, documentaries, short films and commercial movies (Padman and *Phullu*) constructed a dire need for using sanitary napkins as prevention for reproductive health issues, which was well received by Indian women. A latest development for the endorsement of menstrual products can be seen when men appear on the screen and talk sensitively about menstruation and showing concern about women's menstrual health. In movie 'Padman' *Akshay Kumar* as protagonist (based on the life of *Arunachalam Muruganantham* who set an aim for women to attain basic menstrual hygiene) struggle throughout to make women use sanitary napkin in order to reduce reproductive health risks. The appearance of such male characters on screen impacts public by putting women's personal hygiene need and health concern in the centre, engaging both men and women. Therefore, the active role of media paved the way for more industrialists and capitalists venturing into feminine and sanitary products. The increased exposure of women to media has become another significant factor that brought the change in the priorities of MHM according to the economic viability of the consumers so that the large number of people should use the commercially produced sanitary napkins. Women from poor or underdeveloped countries may not be exposed to alternatives of non-biodegradable sanitary napkins and their health benefits due to lack of exposure to media and unavailability and affordability. Having said that, the endorsements of sanitary napkins, also have an effect on the mindset of the menstruators; as it embodies and constructs the 'body image', for women who consume these products. Through repetitive and manipulative communication, the capitalist mindset, adulterate the concept of hygiene by substituting it with beauty, confidence, comfort, image portrayal and fragrances. Shrouded in stigma and discrimination, a sense of disgust and embarrassment is stirred among the menstruators about the process of 'menstruation' and 'body odour'. A similar argument was given by Twine (2001) while giving eighteenth-century picture of aesthetic standards that "…a strong feeling of disgust and embarrassment was encouraged around… menstruation…body odour…" This reasoning is evident of patriarchy, asserting control over women's body, perceiving menstrual blood as dirty and emphasizing on fixed notions about women's aesthetic standards. A similar argument is presented by Morgan and Sue (1993) that, "…classical bodies are controlled, in

conformity with dominant aesthetic standards, and are constructed as being much closer to culture or the civilised." Therefore, the use of sanitary napkins is indicative of maintaining the aesthetic standards of their bodies intact. Such an altered view, communicated subtly in propaganda mode to women, is critical to construction of a self-image where women consider themselves as dirty and temporarily unwanted due to menstruation. As explained by Twine (2001) that "…especially women are encouraged to construct their sense of self about aesthetics categorizations of bodily appearance." Thus, the construction of self-image and body image by women for themselves and society, and its implications on the environment has been explained in cultural ecofeminism.

According to Rao (2012) control over one ecological process, would naturally lead to the exploitation of other. Menstrual waste along with diapers and other non-biodegradable sanitary waste are one of the primary contributors of land, water, soil; and air pollution. Menstrual waste also gets clogged in the sewerage, pipelines and drains when flushed recklessly (Kjellen and Nordqvist, 2011). Disposal of menstrual waste in the rivers make the drinking water breeding ground for germs, infections and virus, resulting in health hazards when water is consumed (Fogde, 2015). Additionally, microplastic[10] that are segmenting in water bodies are contaminating water bodies, limiting the availability of drinking water and exacerbating water crisis. According to Ragusa et al. (2021) microplastics can move from the environment to living organisms, including mammals. They found evidences of microplastic in human placenta signifying the adversities that microplastic is causing amongst living organisms. Leslie et al. (2022) highlighted "…human exposure to plastic particles results in absorption of particles into the bloodstream. This indicates that at least some of the plastic particles humans come in contact with can be bioavailable **for absorption into the human bloodstream."** Establishing the presence of microplasic (plastics less than five millimetres) in human blood and paving a path for further research to study the predisposition of microplastic on human beings on proneness to disease. Therefore, evidentiary studies are prompting on the need to remove the plastic footprints to control the damage that plastic has

[10]Small pieces of plastic, less than 5 mm (0.2 inch) in length, that occur in the environment as a consequence of plastic pollution.

caused to the environment. Further, street animals such as cows and dogs also get exposed to the menstrual waste due to reckless disposal. These animals are often seen attempting to smell, chew and litter the menstrual waste dumped on the roadsides which is hazardous to their health. The pathogens released through menstrual waste may not be evident on the face of it, but its' gradual effect on the environment is indicative of adversities, similar to what Carson et al. (1962) describes in *Silent Spring* i.e., threat to the lives on earth but it inflicts harm to the environment gravely.

According to Mellor (2000) "Ecofeminists see the origin of the present ecological crisis as lying in the specific material and cultural development of the North/West as reflected in its socio-economic structures, science and technology." In addition to it, "Ignoring social difference and inequality puts, equal responsibility for ecological damage on the north and the south; rich and poor; black and white; men and women" (*ibid.*). This concludes that the onus of environment degradation is on everyone who are standing even at the end of it but contributing.

Menstrual waste in India in relation to the environment

Globally, two contradictory conditions usually come in the picture when menstruation is discussed, i.e. availability and non-availability of resources for menstrual hygiene management; a) availability: when women and girls can avail resources for sanitation like water, toilet facilities, affordability and access to menstrual absorbents, b) non-availability: when women are facing severe lack of accessibility to facilities for proper sanitation and personal hygiene such as open defecation, the dearth of clean water and unhygienic or unavailability of private space. Therefore, the availability and unavailability are the universal concern in relation to MHM. The World Health Organization and UNICEF Joint Monitoring Programme for Drinking Water, Sanitation, and Hygiene (2012) defines MHM, when:

> *"Women and adolescent girls are using a clean menstrual management material to absorb or collect blood, that can be changed in the privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required, and having access to facilities to dispose of used menstrual management materials."*

Like other countries, India also adheres to work upon the lines as described in the definition. Water, Sanitation and Hygiene (WASH)is dedicated to the menstrual management and hygiene, mainly through appropriate menstrual absorbent, clean water, soap, and private

place to change the absorbent and disposal of used absorbent. The definition however, does not cover the other significant determinants i.e., providing appropriate knowledge to eradicate myths, taboos and stigmas around menstruation. Thus, to bring upon the environmental change, structural change is required, whereas, the essence of structural change lies in the policies and programmes. With the latest policies adhering to plastic management, a focus has been laid to plastic which is considered compostable and biofriendly. Mahajan (2019) in reference to biodegradable pads tells that "compostable sanitary pads are disposable pads with a high degree of compostable content used as raw material." She further explains that:

> *"Many products entering the Indian market and claiming to be environmentally friendly are actually not so as they use materials that are 'OXO-biodegradable'. An OXO-biodegradable material is one that has metal additives for accelerated degradation by sunlight, heat and/or mechanical stress, so that it finally degrades into micro-particles, which are not visible to the naked eye. Typically degradation of sanitary pads and plastics containing OXO-biodegradable materials leads to formation of micro-plastics that continue to pollute the environment for hundreds of years."*

Along with compostable biodegradable pads, market is also offering alternative biodegradable pads. In few countries (developed and developing) menstruators have started replacing the commercial non-biodegradable methods with the environment sustainable methods, like biodegradable pads, menstrual cups, and reusable cloth pad. However, the success of these products depends on various determinants ranging from availability to socio-cultural and economic factors.

Biodegradable pads are easy to use just like commercial sanitary pads and safe for environment as they get decomposed within a few months after disposal. They are comfortable and viable option for those who cannot handle cloth or other menstrual products but are willing to shift from plastic sanitary pads. Biodegradable pads are made of natural fiber such as jute, banana peel, wood peel and bamboo. Along with reducing the menstrual waste, it has no negative impact on health of women due to no use of polyethylene (plastic), polymers, and polypropylene in it. However, the availability of these napkins is for limited users as they are not manufactured by big companies. These pads are usually sold online or in a few shops where it is approached by limited consumers. Affordability of biodegradable pads is also another factor for not being as

popular as commercial sanitary napkins. For women from low to average income in India, a pack of biodegradable pad is not affordable for their every month requirement. However, a small group of menstruators have started showing their concern towards environment and their own health, thus, started opting other alternatives over commercial pads.

Despite all the pros and cons, preference is given to sanitary napkins over other absorbents due to lack of availability of water for sanitation. The sanitary napkins are ready-made and globally available, without any complexity of washing, cleaning and drying, where it is visible to others. Although, there are options available as alternatives to non-biodegradable pads in Indian market, yet the consumption of these environment friendly products is negligible.

Combating menstrual waste through policies

To address the challenges of environmental degradation and waste management, India laid policies like Swachch Bharat Mission[11] (SBM), 2014; Solid Waste Management Rules[12] (SWM), 2016; and Plastic Waste Management Rules [13], 2016. In-line, The Union Ministry of Environment, Forests and Climate issued new guidelines in the Solid Waste Management Rules, 2016. As per Rule (4)(b) of SWM Rules, 2016, the provision of pouch that can be decomposed is mandatory to be provided by the seller of sanitary pads which shall be disposed of in the dustbin (red in colour), meant for sanitary waste. According to SWM Rules, 2016, menstrual waste should be treated in incinerators as biomedical waste. Ministries of Women and Child Development and Higher Education also spread awareness

[11]To accelerate the efforts to achieve universal sanitation coverage and to put the focus on sanitation, the Prime Minister of India had launched the Swachh Bharat Mission on 2nd October 2014. Swachh Bharat Mission (Grameen) will reinforce ODF behaviours and focus on providing interventions for the safe management of solid and liquid waste in villages.

[12]Solid waste management rules, 2016 mandates the source segregation of waste in order to channelized the waste to wealth by recovery, reuse and recycle of the waste.

[13]To address the issue of scientific plastic waste management, the Plastic Waste (Management and Handling) Rules, 2011 were notified in 2011, which included plastic waste management. The Government has notified the Plastic Waste Management Rules, 2016 and amendments to it in 2018 and 2021.

on menstrual hygiene among women and girls. However, according to data released by SBM in 2017, door to door collection of waste coverage increased from 53 per cent to 80 per cent; but menstrual waste is still not segregated in India.

It is pertinent to mention here that in India, Solid Waste Collection and Handling (SWACH) initiated 'the red dot campaign' in Pune in February 2017, to spread awareness on proper disposal of used sanitary napkins and diapers, to reduce the potential health risks of rag pickers. However, the campaign was not well received due to socio-cultural factors such as prevalent taboos and stigmas about menstruation. Wrapping and leaving a used pad with a red dot on it indicates that the woman or girl in the house is menstruating, and women still feel shy of the fact that no one should know about the arrival of their menstruation. Such programmes need to be encouraged and restarted with a broader coverage from urban to rural areas in schools, colleges, *Anganwadis* and through e-governance program. Under the digital India campaign, these programmes could be promoted and broadcasted on local and national television channels. Ignoring menstrual waste management would break the tandem of efforts dedicated to achieve SDGs. Thus, to break the myths, an open discourse on menstruation needs to be initiated in public platforms to deconstruct the damaging menstrual hygiene practices and re-establish the practices that are ecologically sound.

Conclusion

MHM is the fundamental need of every menstruator. Over the past decade it was seen mostly in light of availability and non-availability of absorbents instead of sustainable ways of menstrual management. The reckless ways of disposal of menstrual waste not only negatively impact the environment but it is a palpitating threat to overall health and wellbeing of every individual. With the growth of industrialisation and capitalisation, the skewed imbalance in the environment became evident. The ecofeminist perspective suggests and provides a better understanding and solutions to healthy menstruation and menstrual waste management. Ecofeminism advocates ways to adopt sustainable methods for both women and nature by handing-out solutions for women's needs for menstrual management, without exploitation of nature. However, discarding and replacing non-biodegradable sanitary napkins with sustainable and environment friendly option needs collaborative efforts.

In India, various policies and guidelines have been laid centric to solid waste management which includes management of menstrual waste to address the concern of sustainable environment. Policies are basic mechanism of the socio-structural changes. Thus, a strong legal and policy framework and its' implementation is required for menstrual waste management. Nevertheless, single access framework cannot be adopted to achieve sustainable environment. It requires intersectionality and participation of each individual of the society. There is need to develop a trajectory between theory and practice with a persistent action to create a sustainable environment. Apart from promoting low-cost biodegradable pads, the government should also focus on the awareness of the policies, enacted from time to time, addressing to the raising concerns of environment. Additionally, extensive data should be collected by the government to make better policies, corresponding to the needs of the environment. Eventually, a strong policy framework would enable women to look for other possible alternatives that are sustainable for both women and overall environment.

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Uncovering the Hidden Reality: Addressing the Gender Disparity among workers in Home-Based Textile Industries of Panipat, Haryana

Muskaan[1]

Abstract

The growth story of India is dampened by declining female labour-force participation. The situation further deteriorates when analysed from point of view of informal sector. About 92 per cent of the total work-forces in the country were employed in the informal sector as per the NSS Survey on Employment and Unemployment (55th round, 1999-2000). Among Indian states, Haryana had highest growth rate of informal workers between 1999-00 and 2004-05 at 7.21 per cent followed by North Eastern states. Within Haryana, 52.43 per cent of total female workers are home-based female workers.The large-scale home-based textile manufacturing activities in Panipat City has served to act as a magnet for women workers from Haryana and other states. However, there is substantial dearth of significant and well accepted research in the area of home-based female workers. The current paper analysed main and marginal workers of Haryana and Panipatusing census of India, 2011that provides relevant data on workers in manufacturing of textiles. The results are calculated using proportionate and graphical method. The result shows that within home-based industry, female participation is lower than males. Also, proportion of females as marginal workers is higher than that of main workers. The current study is a step to bring attention on female home-based textile manufacturing in Panipatand Haryana for future policy-making.

Keywords: Informal workforce, Home-Based, Textile Manufacturing, Female workforce, Haryana, Panipat.

Introduction

Despite the significant improvement in the status of women in both public and private spheres in India since the early 1950s, their access to opportunities in society remains vulnerable, with their

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true potential often unrealized. Women in the country have not substantially benefited from globalization and liberalization in the labor force. The pursuit of flexible working conditions has led to women being drawn to employment without receiving equal compensation in terms of wages, tenure, and social safety nets. The casualization of labor-force, particularly among women, has increased after adoption of liberalization (Deshpande, 2007).The progress of women's labor force participation in India reflects the country's development dynamics. Female participation in the workforce is not only important for economic growth, but also for gender relations in the economic sphere. Therefore, it is essential to comprehensively explore women's engagement with work.

In India, female labor force participation declined from 34.1 per cent in 1990-00 (55^{th} round)to 27.2 per cent in 2011-12 (68^{th} round) as a whole recording persistence and wide gender difference in participation rates (NSSO). The Global Employment Trend Report 2013 ranks India at 120th position out of 131 countries with regards to female labor force participation, indicating poor provision of work for women. Despite the country's strong economic growth, rising income, and wages, women continue to face challenges in accessing employment opportunities.

The female workforce participation rate in Haryana declined from 27.8% in 2001 to 17.8% in 2011, which is consistently and significantly lower than the national average since 1971. However, despite this, the Gross State Domestic Product (GSDP) of Haryana has increased significantly from about Rs. 2.9 lakh crore in 2010-11 to Rs. 7.8 lakh crore in 2019-20 (at current prices). The low rate of female participation in the workforce reflects deep-seated gender inequality in Haryana's political, economic, social, and cultural traditions, making it crucial to examine this issue.

Informalisation,Home-basedWorkandTextileIndustry—theInter-linkages

Workers in the in formal sector are neither registered nor recorded under the legislation, regulations and statistics of national, state or local governments and, therefore, are largely invisible and unprotected. About 370 million workers, constituting 92 per cent of the total workforce in the country, were employed in the informal sector as per the NSS Survey on

Employment and Unemployment (55th round,1999-2000).The contribution of the informal sector to the net domestic production India at current prices has been over 60 per cent. In terms of value addition, savings and investment, the informal sector also constitutes largest portion of the economy.

Among India states, Haryana had highest growth rate of informal workers between 1999-2000 and 2004-05 at 7.21 percent followed by Assam's 6.30 percent and other North-Eastern states 6.25 per cent. The share of informal workers to total workforce in Haryana in 1999-2000was 87 per cent and then significantly increased to 90 per cent in 2004-05 which is almost close to India's share in informal workforce (92percent).

Table1: State specific distribution of informal workers (1999-2000 and 2004-05), India

India and States	Estimated number of informal workers (per thousand population)		Share of informal workers to total workers (percent)		Growth rate during 1999-2000 to 2004-05
	1999-00	2004-05	1999-00	2004-05	(percent)
Andhra Pradesh	438	471	92.23	93.95	1.42
Assam	297	349	85.36	90.19	6.30
Bihar	319	324	95.45	96.46	1.77
Gujarat	408	426	91.44	91.59	2.90
Haryana	296	361	87.51	90.20	7.21
Himachal Pradesh	451	472	91.22	90.20	3.77
J&K	374	349	89.14	88.49	1.62
Karnataka	410	450	91.51	91.90	2.47
Kerala	305	321	80.03	81.27	3.60
Madhya Pradesh	401	423	94.36	94.93	2.92
Maharashtra	368	415	87.25	89.61	3.47
Orissa	378	412	93.46	94.53	3.38
Punjab	349	378	90.26	90.88	3.91
Rajasthan	385	411	93.88	95.17	5.77
Tamil Nadu	416	435	89.27	89.89	0.80
Uttar Pradesh	318	351	94.30	95.53	3.90
West Bengal	326	349	90.75	51.19	4.08
North-Eastern states	325	365	87.97	88.26	6.25
Other States and UTs	233	260	71.31	75.18	2.38
INDIA	360	388	91.17	92.38	3.16

Source: Employment and Unemployment Situation in India (55thround 1999-2000 and 61st Round 2011-12 NSSO, Ministry of Statistics and Programme Implementation, Government of India.

The informal sector can be visualized as a pyramid, with employers at the top having the highest earnings and lower risk of poverty, primarily dominated by men. As we move down the different levels of the pyramid, the risk of poverty increases, and the sector is increasingly dominated by women, who are often in the most vulnerable positions, including as home-based workers and unpaid family workers. Therefore, studying the situation of home-based women workers is crucial to understanding their vulnerability and developing effective policy measures to support them.

Then umber of home-based workers significantly increased in absolute terms from23.3millionin1999-2000to31.0 million in 2004-05, and then to 37.4 million in 2011-12 (Raveendran et al. 2013).Home-based work has traditionally been a prominent source of employment for women. This category of the informal workforce is also gaining attention due to its increased contribution in global production chains. An absolute number of home-based workers are growing, NSSO data (55th round – 1999-2000, 61st round- 2004-2005, 66th round- 2009-2001, 67th round- 2010-2011) trend suggest that this growth has seen more female joining home-based work than men. Among the different states of India, Haryana is on among the top five states in India that is 52.43 per cent of women home-based workers which is significantly higher than the India's percent of women home-based worker sthat is 48.02 percent (Table2).

Table 2: State-specific female home-based workers (UPS), India (2010)

State/India	Estimated number of female home-based workers	Percent of female home-based workers in total (male + female) home-based workers	Share of female home-based workers in Total female workers
Andhra Pradesh	7130102	49.80	38.15
Assam	2909919	44.65	65.74
Bengal	5847879	46.70	45.04
Bihar	5411860	47.51	51.98
Gujarat	5237193	47.52	50.88
Haryana	1763310	43.99	52.43
Karnataka	4789575	46.28	40.06
Kerala	2075389	50.14	33.73
Madhya Pradesh	6326011	46.05	48.80
Maharashtra	8207836	46.62	42.16

Orissa	3626763	50.00	54.47
Punjab	1536101	46.56	46.44
Rajasthan	6806879	47.24	66.55
Tamil Nadu	4948031	50.10	31.04
Uttar Pradesh	14810507	45.72	64.59
INDIA	81427355	47.26	48.02

Source: Tripathi and Mishra (2013)

Home-based workers are concentrated more in the manufacturing sector, which accounted for 72.7% in 2011-12, followed by trade at 14%. These two sectors, along with construction, accounted for over 93% of women home-based workers. Among the manufacturing industries, the highest proportion of home-based workers are employed in textile manufacturing since 1999-2000, closely followed by tobacco manufacturing. In 2011-12, textile industry witnessed a marginal reduction in the share of women workers, which stood at 22%. In the manufacturing sector, female home-based workers are often observed as the main agent of production, with manufacturers linked to global value chains.

Review of Literature

Although there is a lot of information available about the informal sector, there limited research on the distinct characteristics of home-based work (HBW). This has resulted in overlapping and redundant content, and there is a need for more attention to be paid to capturing the often-invisible characteristics of HBW. National and international organizations such as NCEUS, WIEGO, and IEMS have conducted valuable research on the importance of home-based workers. Jhabvala and Shaikh (2011) studied home-based workers in Gujarat and found that while the majority had a family income of Rs. 1,000 to 2,000 a month, the earning of the worker herself was well below the poverty line and stipulated minimum wage. Many workers obtained their work from employers and had to go to a location designated by their employer to obtain work, with 45 percent having to walk more than half a kilometer to get there. European data suggests that workers who are liberally paid by the piece are prone to overwork and harm their health. Bender et al. (2016) provided the first general evidence of a strong link between piece rates and workplace injury. The study's findings suggest that the risk associated with piece-rate work is especially significant for manual workers and men. Incentives may play a counterproductive role, as workers may try to complete more work, increasing the likelihood of

injury. However, there are some limitations to this study. Mehrotra and Biggri's (2002) study on subcontracted home-based work in five Asian countries found that home-based work has a dual character. On one hand, it is an important source of income for home-worker households, but on the other hand, it can have poor working conditions. Chen and Sinha (2016) suggest that housing policies have a direct impact on home-based workers, who often work from their homes, especially women workers. They argue that city governments and urban planners need to integrate home-based workers and their livelihood activities into local development plans.

Bajpayi and Gautam (2020) conducted a qualitative study on women who work from home in two resettlement colonies in Delhi. The study found that women aspire to earn around 100 rupees per day, which is less than one fourth of the minimum wage requirement. Women must balance household and home-based work, and often bear the burden of working longer to complete both tasks.

Women home-based workers face challenges balancing care-related work with their home-based work, leading to difficulties achieving work-life balance. According to Sengupta (2012), Women in informal economy face double burden of work that distinguish women from men. Home-based workers also face challenges related to inadequate infrastructure, lack of access to credit, training and information, and low bargaining power. Therefore, policies and programs that address the specific needs and challenges faced by women home-based workers are crucial to improve their economic and social status. Mahapatra (2012)home-based workers face challenges such as low wages, long working hours, hazardous conditions, and inadequate access to basic services. They are vulnerable due to their economic status, lack of bargaining power, and need to balance work and household tasks. There is a gap in documentation and examination of women's participation in the textile industry in India, and there is an urgent need to address the challenges faced by these workers.

Objective of the Study

1. To analyse the gender gap in home-based textile manufacturing in Haryana and Panipat.
2. To evaluate the gender disparity in the home-based textile manufacturing industry by examining the proportion of male and female workers in the main and marginal worker categories.

Methodology

The focus of the research is female home-based textile workers in textile industries of Haryana and Panipat. The research involves the quantitative approach. The secondary data taken from census of India, 2011 has data on industrial classification of main and marginal workers in manufacturing, processing, servicing and repairs in household industry by sex and class of workers. The National industrial classification (NIC) has been used to identify the workers of manufacturing of textile. As per two digits classification division, 13 is used to compile data for manufacturing of textiles has used. Division 13 further includes spinning, weaving and finishing of textiles (131) and manufacture of other textile (139). Using proportionate and graphical method, the study analysed main and marginal workers of Haryana and Panipat.

To provide more detail about the classification of workers in the household industry, it is important to note that the 2011 Census, a Household Industry was described as an economic activity that is carried out by the head of the household and/or by members of the household, either within the household's premises in urban areas or within the village in rural areas. These activities typically involve the production, processing, or servicing of goods and are usually performed using basic tools and equipment. The main characteristic of a household industry is that it is confined to the house where the household resides. On the basis of employment, they are categorized into types: Main workers and Marginal workers. Workers who work for more than 6 months during the reference period are considered as Main Workers and workers who work for less than 6 months of reference period are known as Marginal Workers. On the basis of class of workers, they are divided into three types, 1) Employee are those who work for others in return of wages and salaries. 2) Single workers are the workers who do their work by himself/herself without the help of family workers. 3)Unpaid family workers work in a household industry without wages and salaries.

Rationale of the study location (Panipat and Haryana)

Haryana is one of the major textile and garment producers in the country, owing to the abundance of raw materials and unique skills of its workforce. Haryana is the fourth-largest producer of cotton, which is a critical raw material for the textile industry in India. The state produces six percent of the total cotton production in the country, with a total of 5.57 lakh hectares of land under cotton cultivation, as noted in the Enterprise Promotion Policy of the

Government of India in 2015.

Out of the 22 districts in Haryana, Panipat stands out for its longstanding tradition of textile manufacturing. The city is often referred to as the "City of Weavers" and the "Textile City" and has gained a reputation as a hub for handloom products in India. Panipat is also renowned for its recycling of discarded textiles, which has earned it the nickname of the "Cast-off Capital". It is the largest center of "Shoddy Yarn" in the world. According to the 2011 census, the population of Panipat district in Haryana was 12.1 lakhs, which ranked it 10th in terms of population size in the state. The district also had a high population density, ranking 3rd in the state with 951 persons per square kilometer, indicating a crowded settlement pattern. Over the years, the literacy rate has shown improvement, particularly among females, with the rate increasing from 58 percent in 2001 to 67 percent in 2011. The Work Participation Rate (WPR) of is 34.2 per cent Haryana in comparison to 35.2 per cent of the Panipat district. The percentage of urban population to total population in Haryana is 34.88 which is close to Panipat 46.05 sex ration in urban area of Panipat is 873 per 1000 and in Haryana it is 868. The percentage of household industry workers to total workers (main and marginal workers) (3.8 per cent in 2011) is highest in Panipat district and higher than the state average (2.9 per cent in 2011) and if we talk about males, 2.74 percent of total male workers in Haryana and 3.42 in Panipat, and female 3.59 percent in Haryana and 5.49 per cent in Panipat. By 2011, Panipat district had received about 1.1 lakh inter-state female migrants accounting for 4.4 percent of total inter-state female migrants coming to Haryana as per the place of last residence criteria. Panipat thus recorded a marginally higher share of female inter-state migrants (19.0 per cent) in total female population as compared to the state average of Haryana (18.9 per cent) in 2011.

The Government of India (GoI) has recently given the green light for the establishment of an Integrated Textile Park (ITP) in Panipat. The project, which will cost around Rs.140 crores and be implemented in a public-private partnership (PPP) model, will cover an area of 30 acres. Panipat's location in the National Capital Region (NCR) is noteworthy due to the fact that almost one-third of its overall area falls within the NCR boundaries, encompassing districts such as Gurgaon, Faridabad, Mewat, Rewari, Sonipat, Jhajjar, Rohtak, and Panipat itself. This means that 40% of the total area of the NCR is located in the state of Haryana.

Table 3: Household and textile manufacturing industry classified by participation of male and female workers, Panipat district, Haryana, 2011.

Districts/State	Total number of male workers in household industry	Total number of female workers in household industry	Total number of male workers in household textile industry	Total number of female workers in household textile industry	Proportion of male workers in household textile industries to total household industry	Proportion of female workers in household textile industries to total household Industry
Panchkula	6826	2808	60	326	0.88	11.61
Ambala	12376	2726	1496	386	12.09	14.16
Yamunanagar	10352	2292	898	344	8.67	15.01
Kurukshetra	4606	2042	444	266	9.64	13.02
Kaithal	6764	3058	830	316	12.27	10.33
Karnal	10988	4186	1314	770	11.96	18.39
Panipat	11180	4634	2728	896	24.40	19.33
Sonipat	11776	6574	1518	676	12.89	10.28
Jind	6244	2486	822	346	13.16	13.91
Fatehabad	4098	2218	314	252	7.66	11.36
Sirsa	7816	3974	882	368	11.28	9.26
Hisar	12224	4332	1762	594	14.41	13.71
Bhiwani	9252	5514	968	388	10.46	7.03
Rohtak	5398	2948	724	392	13.41	13.29
Jhajjar	6468	2686	814	274	12.59	10.20
Mahendragarh	5058	2386	528	174	10.44	7.29
Rewari	5370	4186	484	302	9.01	7.21
Gurgaon	13457	4270	1248	424	9.27	9.93
Mewat	3728	2090	482	140	12.93	6.70
Faridabad	25154	6637	2220	528	8.83	7.95
Palwal	6446	2158	952	170	14.77	7.88
HARYANA	185581	74205	22036	8332	11.87	11.22

Source: Author's calculation from (table B-19), Census of India 2011, Haryana.

Table 3 presents an analysis of district-wise household and textile manufacturing industries based on male and female workers in the state of Haryana, using data from the 2011 census. The results show that the proportion of male and female workers in the household textile industry, as a percentage of the total workers, is highest in the district of Panipat. Therefore, it would be important to conduct a more in-depth study of the household textile industry in Panipat.

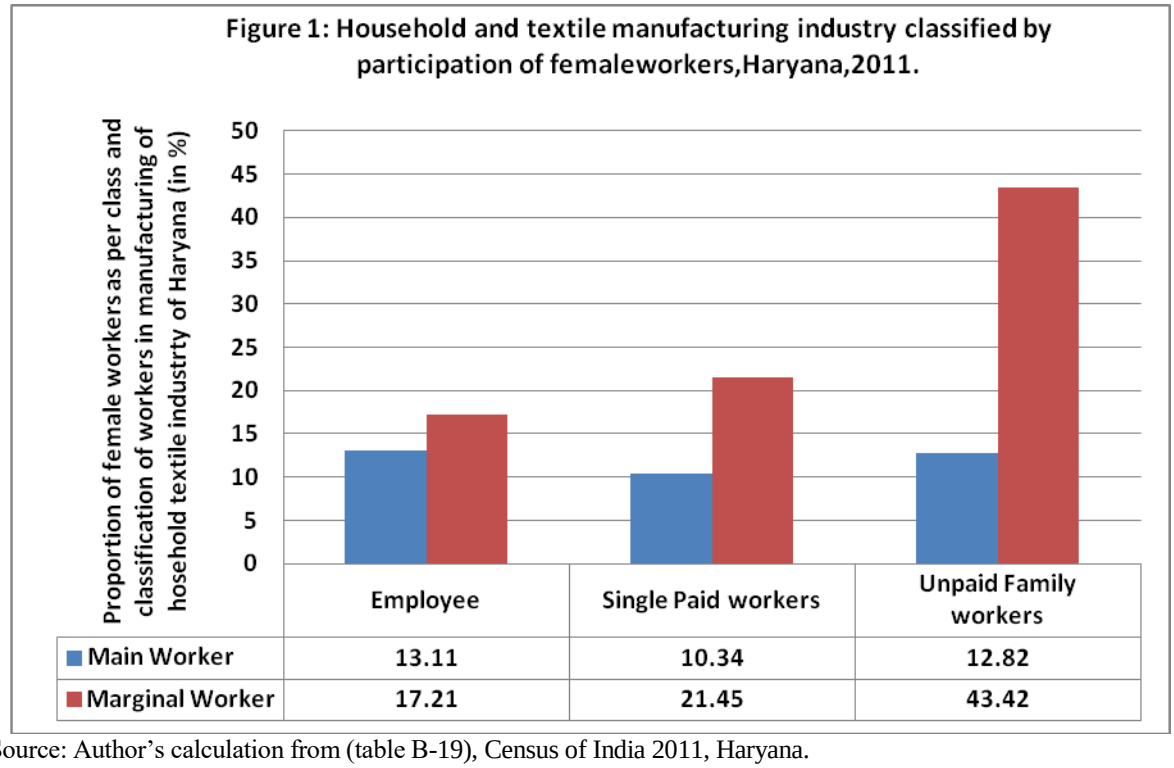
Results and discussion

Home-based workers in India are primarily engaged in the manufacturing sector, with a large concentration in the production of textiles and related products, ininformal textile industries. These workers, who are predominantly women, often work from their own homes or in small workshops and are an essential part of the textile supply chain.

As per the census 2011, the number of male workers in household textile manufacturing (14,983). In comparison to this, number of female workers (6346). Meaning thereby, the number of males engaged are more than double of females.

Further, dividing total workers of home-based textile manufacturing workers into main and marginal, the proportion of female workers in the category of Main workers (12.27 per cent) whereas for marginal workers (32.27 per cent). Given females are engaged more as marginal workers, it means that lesser number of females get work throughout the year.

Figure 1: Household and textile manufacturing industry classified by participation of femaleworkers,Haryana,2011.



	Employee	Single Paid workers	Unpaid Family workers
Main Worker	13.11	10.34	12.82
Marginal Worker	17.21	21.45	43.42

Source: Author's calculation from (table B-19), Census of India 2011, Haryana.

To understand the pattern, data on home based female employees in textile manufacturing

industries of Haryana is examined on the basis of class of workers. In case of employees, the proportion of females in main workers (13.11 per cent) while for marginal female workers (17.21 per cent).For single workers, the proportion of female workers for main workers (10.34 per cent) and for marginal workers (21.45 per cent).As for unpaid family workers, the proportion of female workers for main workers (12.82 per cent) and for marginal workers (43.42 per cent).To conclude, the number of female workers in household textile manufacturing is almost half as compared to that of males in Haryana. To make matter worse, the proportion of female workers involved as marginal workers is more as compared to main workers.

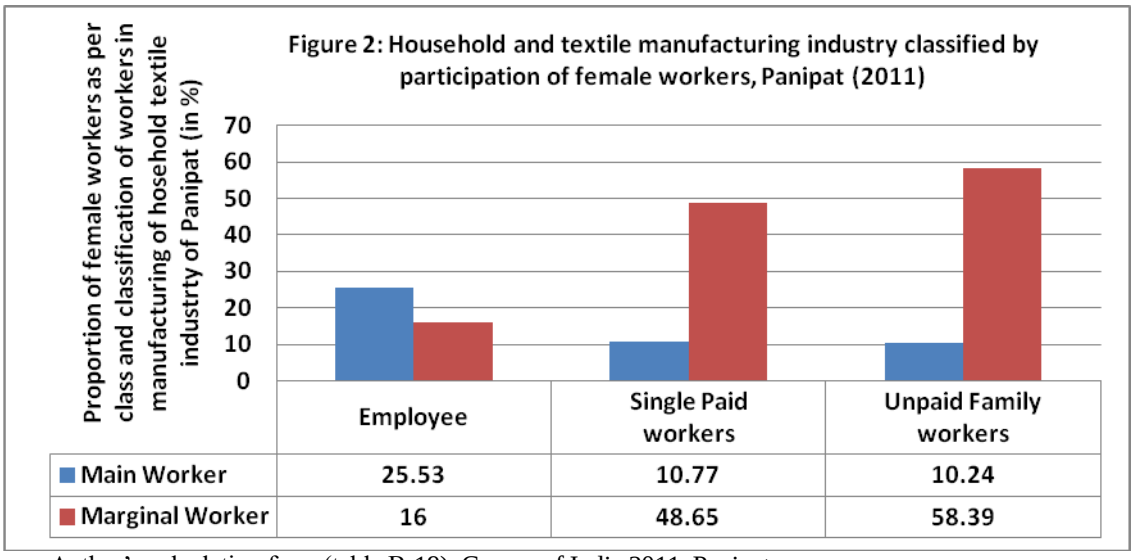
The large-scale home-based textile manufacturing activities in Panipat City has served to act as a magnet for women workers from Haryana and other states. Among all the 22 districts in the state of Haryana, Panipat has unique tradition of textile manufacturing known as "City of weaver" and as "Textile city". Panipat has established itself as a centre of handloom products in the country.

According to the 2011 census, Panipat has the highest percentage of male (24.40%) and female (19.33%) workers in household textile industries compared to other household industries. Despite this, there is a lack of in-depth research on the inter-linkages between informalisation, textile industries, and women in Haryana, with a specific focus on Panipat. Therefore, it is crucial to study the situation in the district to gain a better understanding of the issue.

In the 2011 census, 2,518 male workers were recorded in household textile manufacturing, while only 398 female workers were recorded. This indicates that there were nearly six times more men than women working in the industry. Further, dividing total workers of home-based textile manufacturing workers into main and marginal, the proportion of female workers in the category of Main workers (11.44 per cent) whereas for marginal workers (51.56 per cent). Given females are engaged more as marginal workers, it means that lesser number of females get work throughout the year.

To investigate the pattern, data of home-based female employees in textile manufacturing industries of Panipat district is analysed according to their class. In case of employees, the proportion of females in main workers (25.53 per cent) while for marginal female workers (16per

cent). For single workers, the proportion of female workers for main workers (10.77 per cent) and for marginal workers (48.65 per cent). As for unpaid family workers, the proportion of female workers for main workers (10.24 per cent) and for marginal workers (58.39 per cent).The proportion of female workers is far lesser in Panipat than that of males. Also, majority of these female workers are employed as marginal workers. The only exception is in case of employees, where main female workers are more than marginal female workers.



Source: Author's calculation from (table B-19), Census of India 2011, Panipat.

The situation in Panipat is no different from Haryana with the exception of employed main female workers. The gender inclusivity of female employment in Haryana's household textile industry is a concern, and the same pattern is observed in Panipat as well. Women are primarily employed as marginal workers, which mean they have less job security and are more likely to experience periods of unemployment.

Conclusion and Policy Implication

Haryana has revealed several limitations and areas for improvement. The study has highlighted the integral role of home-based female workers in the production chain, despite their dispersion and lack of recognition. These workers often lack job security, contracts, and minimum wages, and formal enterprises that utilize their labor frequently violate labor laws by failing to register them. To empower these workers, legal recognition is necessary, and awareness campaigns

should be launched to promote their rights and benefits. The transition towards formalization and recognition of home-based workers is directly linked to urban policies, practices, and training programs, which should be developed and implemented by both government and non-government institutions. The study also suggests the importance of developing policies to enhance the skills and education level of home-based workers, and utilizing corporate social responsibility funds to provide micro-credit or working capital facilities to home-based workers through banks as a form of compensation. Finally, the study recommends the redefinition of the methodology and classification of home-based workers according to international standards to facilitate comparisons of the database across countries.

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Prevalence of non-communicable diseases, health care financing and awareness of social programmes among older adults of Maharashtra

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Abstract

Along with other Indian states, Maharashtra faces demographic and epidemiological transitions majorly borne by the older population. The present study aims to identify the prevalence of non-communicable diseases (NCDs) among older adults. Additionally, mean expenditure on health has been examined followed by sources of payments. Lastly, the study focuses on the awareness of social welfare programmes and the benefits received. The data for the present study is extracted from the Longitudinal Ageing Study (LASI),2017-18. Both Bi-variate and multivariate techniques have been used for data analysis. Findings of the study highlighted the higher rate of NCDs (30% had hypertension, 13% had Diabetes, 6% had chronic lung disease, 5% had chronic heart disease, and 4% had anaemia) among the elderly in Maharashtra. The rural populations were at higher risk of NCDs than the urban population. Multivariate analysis suggest that the odds of stroke and chronic lung disease are highly significant with the advancing age. Additionally, males were significantly more likely to suffer with heart disease compared to females. Expenditure on healthcare found to be on higher side among urban older adults and which is almost thrice the spending made by rural counterparts. By religion and caste, Muslims spend more than five times than Hindus and Others, whereas older adults belong to non-SC/ST/OBC category spend the highest whereas it has found lowest among ST counterparts. Regarding source of healthcare expenditure, household income or personal saving found to be a major source across the socio-economic characteristics. In particular, a higher proportion of older adults from (urban areas, Muslim community and poorer households) spend on healthcare either through savings or through loan. The awareness of social welfare schemes was found to be low among older adults. It is recommended that there is need to focus on health care which ought to be interdisciplinary and multi-sectoral and demands the upgradation of health and wellness centres to cater the healthcare needs of older adults.

Keywords: Disease burden, elderly, health expenditure, social welfare programme

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Introduction

The demographic and the epidemiological transition in India has shifted a significant share of the country's burden of disease to the older population. The dramatic and widespread nature of recent and ongoing demographic shifts indicates that the challenges of population ageing that India faces are inevitable and exist enormously. These demographic changes present complex health, social and economic challenges. Thus, efforts are required to understand and use existing knowledge about the prevention and treatment of heart disease, stroke, diabetes, respiratory diseases, and cancer.

With poor social security measures and a weak pension system, a significant proportion of the elderly lives in poverty. Such poverty-driven financial insecurities limit the healthcare utilization capacities for the elderly, leaving a gap in health service provision. Further, the pattern of current health spending in India suggests that households meet more than 68% of health expenditure, 25% by the government (Centre, state and local bodies), six percent by firms and 0.6 % by external flows. While there has been an absolute increase in government health spending over the years, the focus remains on maternal and child health. Projections show that by 2030, 45% of India's health burden will be borne by the older population (WHO, 2010). This high out-of-pocket expenditure leads to health vulnerabilities in the ageing population. Self-reports of diagnosed medical conditions are tied to access to healthcare services and, therefore, can cover undiagnosed conditions. In countries like India, wherein access to healthcare is limited, the prevalence of undiagnosed conditions is expected to be greater than in advanced countries.

The world is facing a situation without precedent as, soon there will be higher proportion of older people than children than ever before. A better understanding of the changing relationship between health and age is crucial if we create a future that takes full advantage of the powerful resource inherent in older populations. Many factors like individual behaviour, family structure and relationship, health system, and health outcomes determine an individual's health status. Although medical service utilization patterns among older persons have steadily increased in recent years, there is no research and shreds of evidence related to an elderly population. To achieve the goals on healthy ageing and as a reflection of

momentum generated around the issue of population ageing, assessing the status of health issues is thought to be essential and formed the fundamental research question.

The state of Maharashtra represents a significant portion of the Indian population in terms of size and socioeconomic, demographic, and health transition. It is a leading industrial State and one of the most urbanized states in India. Maharashtra is the second largest state in India and accounts for almost half of the total population that lives in urban areas. About 10 per cent of the state's population is 60 years or above, which has the highest number of an elder in terms of numbers. The Human Development Index placed 4th rank among all the Indian states, and the life expectancy at birth was 72.5 during 2014-18. Moreover, Maharashtra states have substantial migrant populations from several states in India. Further, Maharashtra has the third-best health care system in India (NITI Ayog, 2019). These conditions give a suitable environment to study the prevalence of diseases (communicable and non-communicable), health care financing and awareness of social welfare programmes among older adults. Owing to the states' diverse socioeconomic, demographic, and health transition conditions, the findings based on this population can roughly be generalized to India. Nevertheless, literature on some aspects of morbidity burden and health-seeking behaviour among the older population exists, but little is known about the disease burden and health care financing among older adults and how it varies by socioeconomic groups in the Maharashtra state. In the context of changing demographics, socioeconomic development and epidemiological transition, this paper explores the prevalence of the different types of morbidities and sources of financing among older adults in Maharashtra.

Data and methods

Data source

The data for the present study has been extracted from the Longitudinal Ageing Study in India (LASI) survey, conducted during 2017-18, covering all 30 states and six union territories of India. However, the LASI fieldwork for Maharashtra state was conducted from August 2018 through April 2019. LASI is undertaken under the Ministry of Health and Family Welfare (MoHFW), Government of India. The International Institute for Population Sciences (IIPS), Mumbai, was the nodal institution for implementing LASI in collaboration

with the Harvard T.H. Chan School of Public Health (HSPH) and the University of Southern California (USC).

Outcome variables

The dependent variables determine the effect of the cause (independent) variables when changed for different values; these have been taken into account for the study to cover the three objectives of the study. The first objective is to determine the prevalence of communicable and non-communicable diseases, self-reported hypertension, diabetes, anemia, stroke, heart disease and lung disease. Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. They include hypertension, stroke, and chronic heart diseases such as rheumatic heart disease, congenital/structural disorder, conduction disorder/cardiac arrhythmias, congestive heart failure, and coronary heart disease/ blockage. Hypertension is a long-term medical condition in which the blood pressure in the arteries is persistently elevated. The prevalence of hypertension tends to increase with age. Stroke, also known as cerebrovascular accident, is caused by a sudden partial or total disruption of blood supply to a part of the brain. This may result from either blockage (ischemic stroke) or rupture of a blood vessel (haemorrhagic stroke). It can cause permanent or temporary paralysis (inability to move, usually one side of the body), loss of speech, and unconsciousness. Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in insulin production by the pancreas or by the ineffectiveness of the insulin produced. Such a deficiency results in increased concentrations of glucose in the blood, which in turn damage many body systems, particularly the blood vessels and nerves.

The second objective is fulfilled by considering the dependent variable expenditure on outpatient visits and sources of spending for outpatient visits. Lastly, the third objective considers the awareness and benefits received from four social welfare programmes. Social welfare programmes such as National old-age scheme, Widow Pension scheme, Annapurna scheme, and other state specific schemes has been considered in the analysis.

Predictor variables

The predictor variables are the independent variables, including the sample population's demographic characteristics. The sample population of Maharashtra has been considered for older adults and the elderly population. Rural and Urban, both are taken into account. By

gender, males and females have been included in the study. All the other religions and Muslims have been clubbed together for meaningful analysis. To understand the condition of health across education, no education, less than primary, primary, middle, secondary, higher, diploma, graduate, postgraduate and professional degree holders are considered. To access the conditions across Monthly per capita expenditure (MPCE), the sample is divided into the poorest, poorer, middle, more decadent and most prosperous. Lastly, the living arrangement has also been given consideration. Univariate, bivariate and multivariate techniques have been applied to fulfil the study objectives. In multivariate techniques, binary logistics regression has been used the see the adjusted effect of exposure variables on outcome variables.

Results

The sample distribution of the study (**Table 1**) shows the highest number of samples from the 45-54 age group, which are spread almost equally across rural and urban. By gender, the sample includes more females than males. The Scheduled Tribe is the least considered by caste, whereas Hindus are the highest in religion. The ones with no education have taken the most part in the study. The maximum samples are of the ones living with spouses and children.

Table 1. Percentage of sample distribution, Maharashtra, LASI Wave 1, 2017-18

Background Characteristics	Percentage	Total
Age groups		
45-54	41.9	1,663
55-64	26.2	1,042
65-74	22.9	908
75-84	7.2	284
85+	1.9	76
Residence		
Rural	50.3	1,998
Urban	49.7	1,975
Gender		
Male	40.5	1,607
Female	59.6	2,366
Caste		

SC	16.9	634
ST	8.2	307
OBC	36.2	1354
Others	38.7	1448
Religion		
Hindu	76.5	3,039
Muslim	13.6	540
Others	9.9	394
Education		
No education	36.8	1,460
less than primary	14.2	563
Primary	14.5	575
middle/secondary	28	1,111
diploma/certificate	0.6	22
Graduate	4	157
Post graduate	1	41
Professional	1.1	44
Wealth (MPCE)		
Poorest	18.9	751
Poor	19.4	770
Middle	20.8	828
Rich	22.1	877
Richest	18.8	747
Marital status		
Currently married	23.3	926
Others	76.7	3,047
Living Arrangement		
Living alone	2.7	107
living with spouse and/or others	12.3	490
living with spouse and children	63.1	2,508
living with children and others	17.7	703
living with others only	4.2	165
Total	**100**	**3973**

Disease Burden & Risk Factors (Reported and Measured)

Table 2 measures the prevalence of some non-communicable and communicable diseases across demographic variables for chronic and acute conditions, including hypertension or high blood pressure, diabetes or high blood sugar, anaemia, chronic lung disease, chronic heart diseases and stroke. The data shows that hypertension and stroke are highest among the 75-84 age group, whereas diabetes and chronic heart disease are highest among 65-74. Lung

disease is found majorly among 85+, while anaemia was most prevalent among 55-64. Hypertension, diabetes, chronic heart disease and stroke were more prevalent in urban than rural areas. The prevalence was higher in rural areas than urban areas for chronic lung disease and anaemia. Alternatively, most diabetes, lung disease, heart disease and stroke were higher among men than women. In contrast, hypertension and anaemia were substantially higher among women than men. As per religion, Muslims have a higher prevalence rate than Hindus and others for hypertension, diabetes, heart disease and stroke. By educational attainment, hypertension and heart disease are higher among those with diplomas or certificates.

Table 2: Self-reported prevalence of non-communicable and communicable diseases by background characteristics, Maharashtra, LASI Wave 1, 2017-18

Background Characteristics	Non-communicable						
	Hypertension	Diabetes	Chronic lung disease	Chronic heart disease	Stroke	Anemia	Total
Age groups							
45-54	15.3	7.4	3.2	1.5	0.7	3.7	**1529**
55-64	31.7	14.1	5.3	5.9	3.1	4.9	**1030**
65-74	37.5	17.4	7.7	8.2	4.4	3.3	**982**
75-84	41.6	14.7	9.3	4.7	4.6	3.9	**325**
85+	32.8	15.3	11.4	4.4	4.3	4.6	**91**
Residence							
Rural	8.8	8.8	5.8	3.3	2.2	4.6	**2307**
Urban	17.5	17.5	5.1	6.5	3.2	3.1	**1651**
Gender							
Male	26.2	14.6	6.6	6.7	3.4	1.9	**1585**
Female	28.7	10.9	4.8	3.3	2.1	5.3	**2373**
Caste							
SC	24.0	11.1	5.7	4.3	2.6	2.5	**621**
ST	22.3	7.1	4.8	2.2	1.5	5.1	**303**
OBC	28.1	10.7	6.7	4.7	3.0	4.2	**1432**
Others	28.5	14.8	4.1	4.8	2.2	3.9	**1375**
Religion							
Hindu	26.0	11.4	5.2	4.4	2.5	4.2	**3151**
Muslim	38.3	19.7	6.3	6.2	3.0	4.1	**454**
Others	28.5	11.7	7.1	5.0	3.0	2.0	**354**
Education							
No education	24.3	9.0	6.9	3.2	2.4	4.9	**1581**
less than primary	28.2	12.9	6.4	4.8	2.9	4.8	**618**

Primary	31.9	13.2	4.3	5.1	3.6	4.5	**509**
middle/secondary	31.2	16.4	4.1	5.9	2.5	2.4	**1020**
diploma/certificate	49.3	16.8	7.2	28.7	5.5	3.4	**22**
Graduate	20.5	17.1	2.8	5.2	2.4	1.1	**139**
Post graduate	17.3	3.6	4.0	0.5	0.0	0.0	**39**
Professional	32.3	17.2	0.0	10.1	0.0	0.0	**34**
Wealth (MPCE)							
Poorest	32.5	17.5	6.4	10.0	3.3	6.2	**687**
Poor	30.4	13.5	4.9	4.7	3.2	4.7	**743**
Middle	25.4	12.0	5.0	3.4	2.3	3.3	**791**
Rich	25.4	9.2	5.9	2.7	3.5	3.4	**896**
Richest	25.8	11.0	5.5	3.5	1.0	2.7	**841**
Marital status							
Currently married	24.5	12.8	5.2	4.6	2.3	3.6	**2976**
Others	37.2	11.2	6.7	4.9	3.6	5.1	**982**
Living Arrangement							
Living alone	30.8	6.4	4.4	5.0	3.6	5.4	**125**
living with spouse and/or others	27.8	16.5	5.6	5.8	2.2	4.0	**526**
living with spouse and children	23.9	12.0	5.1	4.4	2.4	3.5	**2403**
living with children and others	38.9	12.3	7.1	4.8	3.5	5.7	**737**
living with others only	29.1	9.3	5.3	4.0	2.8	1.1	**167**
Total	**30.1**	**12.7**	**5.5**	**4.8**	**2.9**	**4.1**	**3958**

Health expenditure

Several studies suggest health expenditure to be higher for the elderly with no systematic effort to keep health spending at par with the elderly population and health-related vulnerability. As a result, a significant share of such expenditure is personal spending. Our results for the mean amount spent on outpatients visits (INR) by background characteristics depict a similar finding with an average spending of seven thousand rupees.

Table 3 shows the binary logistic regression, which highlights the effects of socio-economic characteristics and risk of developing non-communicable diseases such as heart disease, lung disease, hypertension, anaemia, stroke and diabetes. The odds of showing hypertension, diabetes, stroke, heart disease and chronic lung disease are highly significant across all age groups from the reference category. Males are less likely to suffer from hypertension and extremely unlikely to suffer from anaemia than females, whereas heart disease is higher among males than females. Urban is considerably more prone to hypertension, diabetes, and

heart diseases than the reference category. By religion, Muslims show a high significance for hypertension and diabetes than Hindus and others.

Table 3 Results of binary logistic regression (Odd Ratio) analysis showing the determinants of communicable and non-communicable diseases by background characteristics, Maharashtra, LASI Wave 1, 2017-18

	Hypertension	Diabetes	Heart disease	Lung disease	Anemia	Stroke
Age group						
45-54®						
55-64	2.58	2.18	4.00*	1.77*	1.05	3.26*
65-74	3.69	3.46	6.67*	1.95*	0.77	6.20*
75-84	5.30	3.13	4.19*	3.15*	1.15	6.86*
85+	3.06	3.74	2.41	3.15*	0.58	6.67*
Gender						
Female®						
Male	0.74	1.02	1.71*	1.53	0.36*	1.29
Caste						
Others®						
OBC	1.24	0.86	1.03	1.57	1.05	1.69*
ST	1.10	0.66	0.78	1.03	1.18	1.46
SC	0.88	0.98	1.22	0.99	1.00	1.34
Living						
Others only®						
Children & others	1.41	1.31	0.80	1.72	3.53	1.23
Spouse & children	2.04	1.40	#	2.99	3.93	#
With spouse/others	2.02	1.44	#	3.27	4.55	#
Living alone	1.25	0.54	0.53	0.62	3.51	0.90
Residence						
Rural®						
Urban	1.90	2.10	2.01*	0.84	0.75	1.16
Religion						
Hindu®						
Muslim	1.32	1.61	1.76	1.00	0.58	1.24
others	1.37	1.06	0.76	1.45	0.67	1.31
Education						
Higher®						
Middle/secondary	1.58	1.50	1.08	0.58	0.64	0.94
Primary	1.59	1.38	1.14	0.66	1.23	1.32
Less than primary	1.12	1.12	1.63*	0.99	1.10	0.78
MPCE						
Poorest®						
Poorer	1.00	0.93	0.35*	0.86	1.11	0.79
Middle	0.78	0.79	0.38*	0.81	0.88	0.68
Richer	0.73	0.62	0.28*	0.84	0.64	0.79
Richest	0.71	0.62	0.29*	0.70	0.54*	0.26*
Marital						
Others®						
Currently married	0.54	1.20	0.00	0.42	0.72	0.00

Notes: ® is reference category, * p<0.05; # Low frequency

Table 4 highlights the mean expenditure on health highest among older adults from 45-54. The mean cost of health majorly skewed among urban older adults and is almost three times more than rural older adults. Elderly females spend more on health than males. By religion and caste, Muslims spend more than five times than Hindus and others, whereas others spend the highest and ST spends the lowest. Those with a professional degree spend the most elevated on health compared to those with no education. As per the MPCE quintile, the poorest spend the highest compared to the richest. The currently married and living with their spouse and children spend the highest on their health.

Table 4 Results for mean amount spent on out patients visits (INR) by background characteristics, Maharashtra, LASI Wave 1, 2017-18

Background Characteristics	Mean amount spent on out patients visits (INR)	Frequency
Age groups		
45-54	9946.6	834
55-64	5188.9	645
65-74	5549.3	649
75-84	6544.2	207
85+	8890.6	59
Residence		
Rural	4434.8	1452
Urban	11346.6	941
Gender		
Male	5104.7	864
Female	8308.1	1529
Caste		
SC	4384.8	380
ST	2693.6	174
OBC	5164.3	917
Others	11948.0	776
Religion		
Hindu	4907.1	1949
Muslim	28115.2	230
Others	5070.3	214
Education		
No Education	4002.6	982
Less than primary	5580.1	390
Primary	4391.4	321
Middle/secondary/higher secondary	4941.1	574
Diploma	23460.0	15
Graduate	81385.8	70

Post Graduate	6414.9	19
Professional	25430.5	22
Wealth (MPCE)		
Poorest	22403.4	391
Poor	5260.0	468
Middle	4802.1	514
Rich	3633.8	568
Richest	3007.9	452
Marital status		
Currently married	7899.7	1783
Others (divorced/separated/	4965.0	610
Living Arrangement		
Living alone	3674.6	90
Living with spouse and/or others	7389.0	329
Living with spouse and children	8099.9	1427
Living with children and others	5442.8	458
Living with others only	3402.8	90
Total	**7892.7**	**2393**

Under India's decentralized approach to health care delivery, the states are primarily responsible for organizing health services. Because of severe staff shortages and supplies at government facilities, many households seek care from private providers and pay out-of-pocket. The different sources of expenditure are personal income, household income excluding personal income, savings, loans, contributions, sold assets, insurance, reimbursement and other sources. The most preferred source of expenditure is a personal income and household income.

As mentioned above, **Table 5** shows the mode of spending on outpatients visit by background characteristics in Maharashtra. It reflects that the aged group 75-84 and 85+ spend the highest household income. Both, the rural and urban areas pay the most from their household income. By gender, males allocate more from their income, and females spend more from their household income. The ones who belong to ST pay the most from their income, followed by OBC, who spend the most from their household income. Education-wise, those with a professional degree pay the most from their gain; those with a post-graduate degree spend the same from sold assets, insurance, and reimbursements. The ones who belong to the middle MPCE spend the most from their household income, whereas the

poorest pay the most from their income. People living alone spend the highest, that too from their private expenditure.

Table 5 Results for source of expenditure on out patients visits by background characteristics, Maharashtra LASI Wave 1, 2017-18

Background Characteristics	Household income	Personal income	Savings	Loans	Contribution	Sold assets	Insurance	Total
Age groups								
45-54	71.6	76.1	51.3	51.2	52.0	57.6	58.0	**834**
55-64	79.4	72.0	54.6	53.4	54.3	60.0	60.3	**645**
65-74	76.3	73.3	56.9	54.4	55.4	61.6	62.7	**649**
75-84	81.2	70.6	59.2	58.9	62.6	62.0	62.3	**207**
85+	83.2	65.7	67.8	57.3	59.3	64.4	64.4	**59**
Residence								
Rural	73.7	70.1	47.6	47.0	48.2	54.6	55.0	**1453**
Urban	79.8	78.7	65.9	63.4	64.5	68.1	68.8	**941**
Gender								
Male	69.1	80.1	54.7	52.9	53.3	60.7	61.5	**865**
Female	80.1	69.7	54.9	53.8	55.4	59.4	59.8	**1529**
Caste								
SC	70.4	71.3	46.9	45.4	47.3	50.6	50.8	**380**
ST	68.2	81.1	53.7	52.3	52.5	61.6	61.6	**174**
OBC	77.5	73.7	56.5	55.2	56.1	62.8	63.6	**917**
Others	78.2	74.3	56.9	55.5	56.7	61.1	61.3	**776**
Religion								
Hindu	76.2	73.3	54.2	53.0	54.0	60.1	60.6	**1950**
Muslim	82.0	76.4	63.8	62.3	63.6	63.9	65.3	**230**
Others	69.1	72.7	50.9	48.4	50.9	53.7	53.8	**214**
Education								
No Education	76.2	71.8	53.1	51.8	53.3	58.4	59.0	**982**
Less than primary	79.8	71.2	57.5	55.7	56.7	61.2	61.2	**391**
Primary	77.8	70.8	52.7	52.8	54.0	59.5	60.2	**321**
Above primary	74.4	77.6	56.5	55.0	55.8	61.6	62.2	**574**
Diploma	55.1	79.0	60.2	44.6	44.6	52.5	52.5	**15**
Graduate	71.0	75.4	50.3	50.3	50.6	53.9	54.6	**71**
Post Graduate	66.7	92.8	70.0	64.7	64.7	77.6	77.6	**19**
Professional	64.2	95.0	67.6	63.4	63.4	74.4	74.4	**22**
Wealth (MPCE)								
Poorest	78.2	77.2	59.5	58.6	60.4	63.2	63.7	**392**
Poor	80.2	69.7	56.8	54.4	55.6	63.5	64.0	**468**
Middle	79.0	72.6	53.8	54.5	55.1	59.2	60.2	**514**

Rich	76.0	74.4	54.7	53.9	55.1	60.3	60.7	**568**
Richest	66.9	74.2	50.0	46.4	47.5	53.5	53.7	**452**
Marital status								
Currently married	75.5	73.6	53.6	52.4	53.0	59.2	59.9	**1783**
Others (divorced/separated)	78.0	73.1	58.4	56.5	59.4	61.9	62.0	**611**
Living Arrangement								
Living alone	57.9	85.7	59.2	56.9	66.8	60.0	60.0	**90**
Living with spouse and/or others	76.8	73.4	58.4	56.2	56.9	61.4	62.0	**329**
Living with spouse and children	75.6	73.5	52.6	51.7	52.1	58.9	59.6	**1427**
Living with children and others	83.5	69.1	58.1	56.5	58.5	62.2	62.3	**458**
Living with others only	63.1	84.2	55.0	52.6	53.7	58.2	58.2	**90**
Total	**74.2**	**75.4**	**56.7**	**54.5**	**57.6**	**60.1**	**60.4**	**2393**

Family, Social Network and Social Welfare Programmes

The elderly population suffers from income loss, decreased social role and increased dependence, and physical and mental problems associated with ageing. The focus of the existing social welfare schemes is below the poverty line elderly population. However, if the older adults are aware of these welfare schemes, they can benefit from them. This report covers awareness and helps received from the National old-age pension scheme, Widow Pension scheme, Annapurna scheme, and other state-specific schemes. These schemes are only applicable to the ones aged 60 and above.

Table 6 reflects the awareness and benefits of any social welfare programme. The ones who belong to the rural areas were more aware and received more benefits than those in urban areas. The study finds similar results for those living alone. Males were comparatively more aware of the schemes; however, more than double females benefited from the schemes than males. ST seems to be more mindful of caste, with the highest percentage of these schemes' beneficiaries. Those who have completed their graduation have more awareness about social welfare schemes; however, those with no education received the most benefit. The attention of the scheme was moderately same around MPCE quintile, but the richest received the maximum benefit.

Table 6 Results for awareness of social welfare programmes by background characteristics, Maharashtra, LASI Wave 1, 2017-18

Background Characteristics	Awareness (any schemes)	Total	Benefit (any schemes)	Total
Residence				
Rural	39.3	**1056**	24.1	**406**
Urban	34.8	**704**	13.0	**244**
Gender				
Male	38.4	**787**	11.4	**284**
Female	36.8	**973**	26.6	**366**
Caste				
SC	41.7	**279**	27.4	**118**
ST	44.3	**130**	43.5	**57**
OBC	36.9	**644**	20.7	**225**
Others	35.2	**592**	9.7	**206**
Religion				
Hindu	38.1	**1394**	20.6	**519**
Muslim	28.1	**201**	11.0	**57**
Others	44.2	**166**	22.2	**75**
Education				
No Education	35.3	**837**	28.0	**296**
Less than primary	38.2	**309**	25.6	**113**
Primary	31.0	**196**	14.6	**61**
middle/secondary/higher secondary	42.6	**348**	6.3	**143**
Diploma	31.8	**10**	0.0	**3**
Graduate	63.06	**41**	0.0	**27**
Post Graduate	37.9	**6**	0.0	**3**
Professional	50.2	**12**	0.0	**5**
Wealth (MPCE)				
Poorest	39.4	**269**	5.4	**107**
Poor	38.79	**326**	17.1	**125**
Middle	38.03	**349**	17.7	**130**
Rich	36.62	**423**	24.5	**155**
Richest	35.61	**393**	31.3	**133**
Marital status				
Currently married	37.0	**1099**	12.1	**391**
Others (divorced/separated/	38.4	**661**	31.8	**259**
Living Arrangement				
Living alone	60.6	**89**	45.9	**55**
Living with spouse and/or others	36.1	**299**	15.5	**108**
Living with spouse and children	37.5	**788**	10.6	**280**
Living with children and others	37.7	**501**	26.5	**193**
Living with others only	17.8	**83**	49.1	**14**
Total	**37.5**	**1760**	**20.0**	**650**

Discussion

The present study throws crucial insights over the prevalence and potential determinants of non-communicable diseases, associated healthcare expenditure and awareness of social welfare programs and its utilization among older adults of Maharashtra. Study revealed that hypertension, diabetes, stroke found to be higher in urban areas whereas anemia found higher in rural areas. Similarly, chronic lung and heart diseases found higher among male compared to female whereas anemia found higher among women than men. Considering religion, hypertension and diabetes found higher among older adults from Muslim community. Cardiovascular diseases lead to premature deaths and are amongst one of the most common lifestyle 'silent killer' diseases today. Findings suggest that cardiovascular risk factors were higher in the urban than in the rural population and increased with advancing age; this is in line with a study (Samuel et al., 2012). A major reason behind this is due to overweight and obesity, dyslipidemia and tobacco use. Tobacco and alcohol use was more common among men, while obesity found more common among women may be because of low fruits and vegetables consumption (Shridhar et al., 2014). There is an increasing nutrition transition that is leading to changes in dietary intake patterns because of the adoption of 'modern' lifestyles due to social and economic development (Shetty, 2002). Similarly, results suggest that non-communicable diseases found higher among poorest wealth quintile group. The possible reason could be more affluent people start to change their behavior and adopt healthier lifestyles, probably due to multiple factors (greater awareness, greater self-efficacy, better access to healthy diets), to lead to a lowering of their risk, while the burden of disease shifts to the poorest (Anchala et al., 2014).

Risk factors tend to be intensive among the high socioeconomic groups and urban dwellers, who have early access to these 'modern' lifestyles. The socio-economic environment also influences the profile of glucose intolerance and diabetic complications. Many studies suggest that diabetes mellitus among men may be recognized and diagnosed earlier than those in women diagnosed. They are leading to better access to the health system compared to women. This has implications for access to treatment between the sexes and gender equity in general (Kutty et al., 2018). Anemia, a severe global public health problem, is increasing with age. Previous work suggests that iron deficiency might have contributed to the high

prevalence of anemia for older adults (Alvarez-Uria et al., 2014; P. Malhotra et al., 2004), whereas others show the destitute bioavailability of vitamin B12 in a typical Indian vegetarian diet and substantial prevalence of vitamin B12 deficiency(Shridhar et al., 2014). Apart from overall poverty, the health status of women in India reflects gender discrimination from birth, inequitable distribution of health resources, and early and frequent reproductive cycling and reproductive tract infections (Bentley & Griffiths, 2003). The high rates of anemia among women reflect their social and biological vulnerability within both society and the household.

The economic well-being of households is a critical factor of elderly health. In the absence of a robust and universal social security system, the low coverage of old-age pension, a large share of employment in the informal sector, early retirement from formal work, and increasing health expenditure, elderly households are economically vulnerable and prone to financial shocks. Furthermore, increasing urbanisation, rural-urban migration, and modernization have led to several socioeconomic changes, including changes in the structure of families and living arrangements.

Expenditure on healthcare found to be on higher side among urban older adults and found almost thrice the spending made by rural counterparts. With the rise in the elderly population and the commitment to increase public spending on health, there is a greater need to reallocate the resources to reduce the burden of health expenditure (Mohanty et al., 2014; Sahoo et al., 2021). By religion and caste, Muslims spend more than five times than Hindus and others, whereas older adults belong to other category spend the highest whereas found lowest among ST counterparts. Regarding source of healthcare expenditure, household income or personal saving found to be a major source across the socio-economic characteristics. Additionally, results suggest a higher proportion of older adults from urban areas, Muslim community and poorer households spend on healthcare either through savings or through loan. Social welfare schemes help in achieving economic independence among the elderly. Knowledge of social welfare schemes and their utilization helps family physicians make informed decisions on treatment costs. Our findings depict that a higher proportion of older adults from rural areas and among SC/STs were aware of such schemes and this is reflected while getting benefit out of such schemes. Elderly-specific challenges are the

increasing burden of non-communicable diseases, injuries, inadequate finances, and lack of inter-sectoral coordination (Goswami et al., 2019) Our finding shows that most respondents know the National Old age pension scheme, which is still less than 50%. The number of people who gained from the schemes is deficient; this indicates they have not been published adequately, and proper strategies to reach out to them have not been conceived. Social support takes several forms, including emotional, instrumental, appraisal, and financial support. There is a direct relationship between social support and living satisfaction; as social support increases, living happiness increases (Chou et al., 2006).

Conclusion

The critical requirements for a sound health system include universality, comprehensiveness, equitability, effectiveness, responsiveness, accessibility, and quality (World Health Organization, 2014). There is a need to focus on health care, which is interdisciplinary and multi-sectoral. The introduction of Ayushman Bharat stands as a segmented approach of health service delivery to a comprehensive need-based health care service with the introduction of Health and Wellness Centres (HWCs). However, it is recommended to address the quality of care including health infrastructure gaps, required human resource and consumables. Incorporating geographical heterogeneity in terms of disease profile as well as population density need to considered while designing service delivery.

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LaQshya Initiative in Public Health Facilities: An Assessment in Karnataka, Maharashtra and Jharkhand States

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Abstract

LaQshya initiative is a programme for improving the quality of care in the labour room and maternity Operation Theatres at public health facilities in India. The LaQshya initiative is an evidence-based approach to improving the quality of maternal and newborn care. The study aims to examine the status of infrastructure, availability of human resources, quality improvement cycles and satisfaction of beneficiaries about Respectful Maternity Care. We have visited 22 health facilities in Karnataka, Maharashtra and Jharkhand States along with a PIP visit, where the LaQshya initiative has been implemented and required information was collected by interviewing the district's health officials and delivered women. Results indicate that LaQshya initiatives are significantly contributing to giving the quality of services in certified and State-level assessed facilities, remaining facilities are improving their capacity and are in process of deployment and redeployment of the human resource but none of the labour rooms have a human resource as per defined norms. Beneficiaries were satisfied with the availability of services and quality of services under the LaQshya initiative. At the outset, the initiative is functioning satisfactorily and effectively in the certified and State assessed facilities.

Keywords: LaQshya, Labour room, Quality Improvement Cycles, Quality of Care, Respectful Maternity Care, India.

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Introduction

However, we have missed the National Health Policy - 2017(2.4.1.2a) goal to achieve the Maternal Mortality Ratio (MMR) from current levels to 100 by 2020 but the continuous reduction in MMR in the past decade is promising. The MMR was 398 per 100,000 live births in 1997-98, which has been subsequently reduced to 254 in 2004-06, 169 in 2011-13 and 113 per 100,000 live births in 2016-18(SRS, Bulletin). It is estimated that approximately 46 percent of maternal deaths, over 40 percent of stillbirths and 40 of percent newborn deaths take place on the day of the delivery (Govt. of India, 2017). However, these indicators remain unacceptably high as compared to developed countries, hence there is a huge scope to bring improvement in the key maternal and newborn health indicators and a transformational change in the processes related to care during the delivery, which essentially relates to intrapartum and immediate postpartum care. The LaQshya initiative has been introduced by the Ministry of Health and Family Welfare, Government of India in 2017, to improve the quality of care in labour rooms and Maternity Operation Theatres (OTs) in public health facilities. Ensuring high QoC at the time of birth encompasses the application of evidence based obstetric and neonatal care and efforts to ensure positive birth experiences for pregnant women (Tuncalp O et al., 2015). The LaQshya initiative is an evidence-based approach to improve the quality of maternal and newborn care and provides Respectful Maternity Care (RMC), particularly during the intrapartum and postpartum periods. Implementation of these guidelines is expected to result in the delivery of respectful and zero-defect care to all pregnant women and newborns. Humble and dutiful care during childbirth has been termed as "a universal human right that encompasses the principles of ethics and respect for women's feelings, dignity, choices, and preferences(Reis et al., 2012). After the implementation of the National Health Mission, a significant number of institutional deliveries has increased in India. In this context, this programme is expected to be a game-changer in the field of safe motherhood interventions via policies of the government by further building on the good habit of people to go for safe institutional deliveries as mentioned in the LaQshya guideline. However, the LaQshya initiative must be complemented by other strategies to have glittering success in the reduction of MMR and hence the promotion of safe motherhood. Under the initiative, a multi-layered strategy has been framed such as concrete steps for infrastructure

advancement, ensuring availability of essential equipment, providing adequate human resources, capacity building of health care workers and improving quality processes in the labour room and maternity OT. One of the key interventions in the LaQshya initiative is six focused Quality Improvement Cycles of two months each in all LaQshya facilities, such documentation, RMC, timely management of complications, judicious use of Oxytocin, essential &emergency newborn care and infection prevention and Biomedical Waste Management (BMW). Several studies have indicated that the inappropriate handling and disposal of healthcare waste poses health risks to health workers who may be directly exposed and to people near health facilities, particularly children and scavengers who may become exposed to infectious waste and a higher risk of diseases such as Hepatitis and HIV/AIDS (Sawalem et al., 2009; Adegbita et al., 2010; Coker et al., 2009; Path, 2009; WHO, 2014). Additionally, ensuring that staff working in the labour room and maternity OT are not shifted from maternity duty to other departments/ wards frequently and further fortify critical care in Obstetrics, dedicated Obstetric ICUs at the Medical College Hospital level and Obstetric High Dependency Unit (HDU) at District Hospitals are operationalized under LaQshya initiative. LaQshya initiatives are also implemented in Government Medical Colleges (MCs) besides District Hospitals & equivalent health facilities, all designated FRUs and high case load CHCs with over 100 deliveries/ 60 (per month) in hills and desert areas. In India, a total of 2,427 facilities were selected for the LaQshya initiative including 193 Medical Colleges. The study aims to assess the infrastructure upgradation, availability of essential equipment, adequate human resource, and capacity building of healthcare workers under the LaQshya initiative and also examine the effects of the LaQshya initiative on quality improvement cycles. Further, the study assessed the satisfaction of beneficiaries with Respectful Maternity Care.

Material and Methods

The present study was conducted in 22 public health facilities across the Karnataka, Maharashtra and Jharkhand States. These facilities were selected, with the directions of the Ministry of Health and Family Welfare (MoHFW), Government of India. The data collection was done among the respective districts. One Medical college and hospital, 4 District Hospitals (DHs), 3 Sub Divisional hospitals, 13 Community Health Centers (CHCs)/Rural

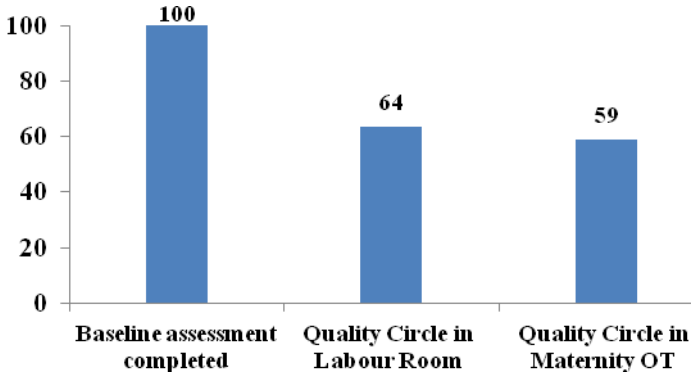
Hospitals (RHs) and one Urban Primary Health Centre (UPHC) were covered for the study. Along with the services statistics and field observation, we have also interviewed District Nodal Officers, Hospital Managers, District Quality Consultant/Coordinators and district coaching team members of all selected districts, Medical Superintendents, Medical Officers and Staff Nurses of visited facilities using a pre-designed checklist. Further 69 beneficiary exit interviews have conducted with those who were available on the day of the visit to assess the beneficiary's satisfaction level concerning RMC with a semi-structured questionnaire.

Results

Institutional arrangement and operationalization of LaQshya initiatives

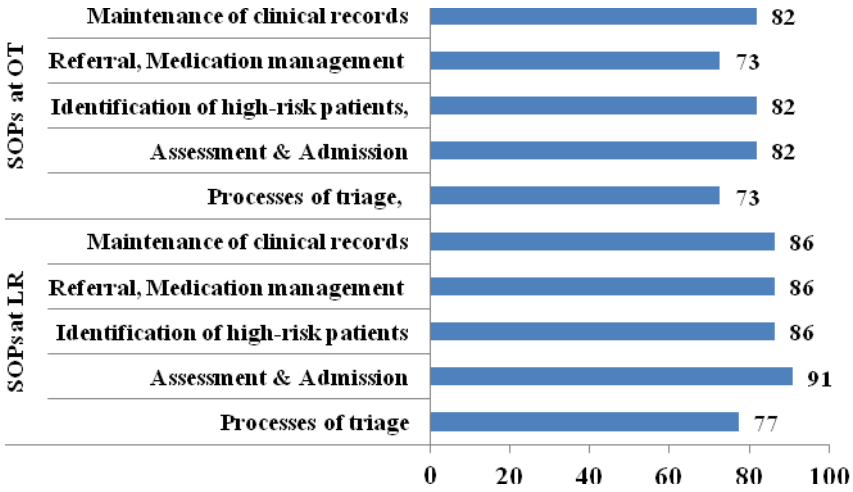
District level coaching team has been formed including Civil Surgeon (CS)/District Surgeon (DS)/District Health Officer (DHO), district-level programme officers and paramedical staff. All districts have designated Nodal Officers for LaQshya initiatives. The coaching team is an external multidisciplinary team, responsible for mentoring all LaQshya facilities in the district. As per the District officials, all coaching teams have trained in skills lab/Dakshata and district-level review meetings are being conducted every month. During these meetings performance of LaQshya indicators and gap analysis is being reviewed.

Figure 1: Baseline assessment and Quality Circle in Labour Room/Maternity OT in visited LaQshya facilities (in percentage)



Facility-level quality circles have been formed including Gynaecologist, Anesthetist, Medical Officer, In-charge Staff nurse for Labour room and OT. A quality circle team in a labour room would involve Gynaecologist, Paediatrician, Nursing Staff and Support Staff. Figure 1 shows, all visited facilities completed baseline assessment, 64 and 59 percent of the facilities formulated quality circles in the labour room and maternity OT respectively.

Figure 2: Standard Operating Protocols at Labour room and Maternity OT in visited LaQshya facilities (in percentage)



The quality circle of operational theatre also involved the Anesthetist as a member. The Quality Circle team is working in coordination with the facility-level quality team headed by the District Surgeon at the district hospital, HOD at the Medical college and hospital and MS at SDH/CHC and MO at UPHC in all the districts, however, the quality circle is not being formed in UPHC at Labour room and OT in one of the districts of Karnataka. In Maharashtra, three facilities have not formed quality circles at the labour room and OT. Only one facility has formed a quality circle out of five visited facilities in Jharkhand state.

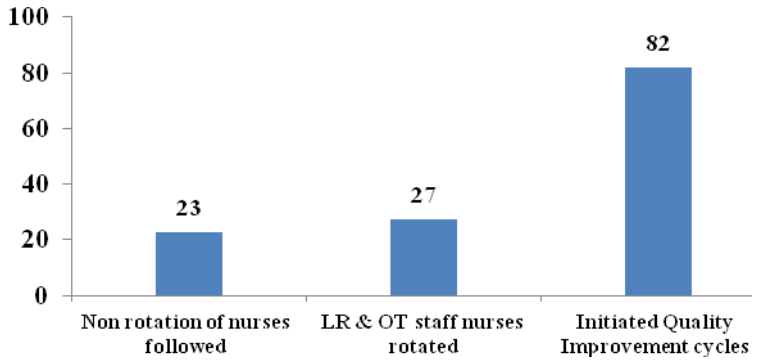
According to coaching team members, all visited facilities completed the baseline assessment and gap analysis of facilities as per the guidelines. They have completed branding at a medical college and hospital in Karnataka. Seventy-three to 91 percent of the visited facilities have developed Standard Operating Protocols (SOP) for Labour room and OT (Figure 2).

Infrastructure

All visited facilities have completed the assessment of gap analysis of facilities as well as infrastructure upgradation planning. In Karnataka, the HoD of Gynaecologist expressed that, the Medical college has developed all infrastructure related to LaQshya as per the guidelines and the remaining two facilities are upgrading as per the Labor, Delivery and Recovery(LDR) and some repair work is conducting at the UPHC and new Maternal and Child Health (MCH) block is under construction at DH. The district coaching team member of the Jharkhand State

indicates that one RH and one CHC in Gumla, District Hospital and one CHC in Latehar district have identified a lot more gaps related to the infrastructure, further resources are to be developed at all the facilities. In Maharashtra, Labour rooms of seven facilities in Ahmednagar district and three facilities in Chandrapur district are upgrading as per the LDR and some of the upgradation/repair works are being conducted. As per the respective district monitoring team members, half of the visited facilities are not having adequate space as per delivery load, Labour Room layout is not arranged in the LDR concept, non-availability of storage area, nonstructural components are not properly secured, Labour room has not sufficient fire exit to permit safe escape to its occupant at the time of the fire, non-availability of functional telephone and intercom services, no instrument trolley, dressing trolley, deck brush, wheels & brakes and hand grip. As per the district coaching team member, a lot of infrastructure and resources are to be developed at the remaining ten facilities in both districts of Maharashtra state. For this separate infrastructure, the fund is being allocated to LaQshya facilities in both districts in Maharashtra state.

Figure 3: Staff working pattern in labour room/ maternity OT and Initiation of Quality Improvement cycles (in percentage)



Human Resource and Training

All visited facilities have identified an in-charge person for labour room and OT. Most of the cases Staff Nurses are in charge of labour room and OT for LaQshya initiatives at the facility level. A district coaching team has formed including DS, DHO, RCHO, Gynecologist, pediatrician and quality consultant in the study district. The members of the coaching team have attended the LaQshya training. Further, LaQshya initiative orientation and Dakshata training were conducted for Staff Nurses at the district level. Adequate human resource at the LaQshya facility is one of the major conditions in the guideline. As per the district level officials, human resources in the visited LaQshya facilities are not adequate as recommended

in the guideline and rotation of the duties of Staff Nurses are allowed in all the visited facilities except the medical college of Karnataka State, overall in the visited facilities 23 percent of the visited facilities following non-rotation of nurses and 27 percent in labour room and OT. Eighty-two percent of the facilities initiated the quality improvement cycle (Table 1). Coaching team members need to ensure adequate HR in LaQshya facilities.

Equipment, Medicine and Diagnostics

All the visited LaQshya facilities have supplied the new equipment including the new delivery tables, and mannequins (training equipment) for the training at the workplace. Consumable materials related to infection control, materials for the disposal of bio-medical waste. They usually provide medicines every month and if needed twice a month. Separate indents are being made through the maternity ward and also made provision medicines under the JSSK programme. Respective District officials felt that all LaQshya facilities are having medicine as per the essential medicines list provided by the respective States.

Figure 4: Implementation of Clinical Guidelines, Clinical Pathways, Referral Protocols and check-lists in visited LaQshya facilities (in percentage)

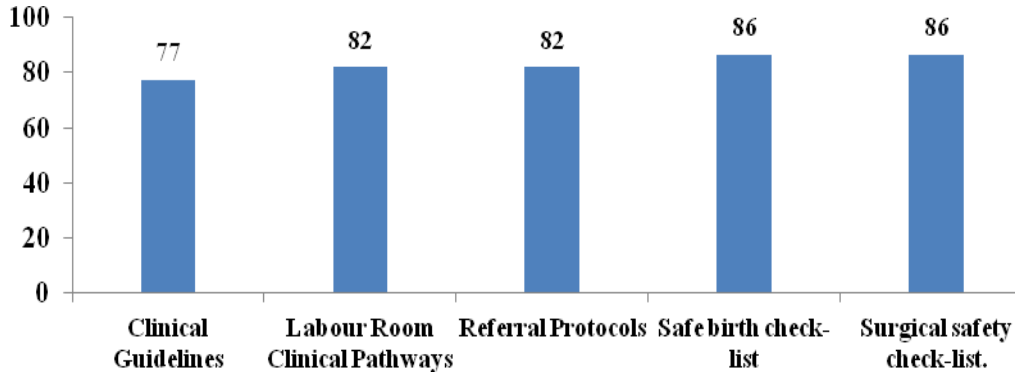


Figure 4 represents that 77 percent of the visited facilities are following the clinical guideline set by the LaQshya initiative, 82 percent of facilities have maintained the referral protocols and labour room clinical pathways and 86 percent of the facilities are using the checklist for a safe birth and surgical procedures.

Table 1: Basic requirements at LaQshya facilities in visited States

Indicators	Karnataka	Jharkhand	Maharashtra	Combined	
				Status	Status in percent
District level					
District coaching team constituted	3	5	14	22	100.0
District coaching team visits	3	4	14	21	95.5
Conduction of baseline	3	5	14	22	100.0
District level training on LaQshya	3	2	14	19	86.4
Facility level					
Baseline assessment completed	3	5	14	22	100.0
Quality Circle in Labour Room	2	1	11	14	63.6
Quality Circle in Maternity OT	2	1	10	13	59.1
SOPs made for LR					
Processes of triage	2	3	12	17	77.3
Assessment & Admission	3	4	13	20	90.9
Identification of high-risk patients	3	4	12	19	86.4
Referral, Medication management	2	4	13	19	86.4
Maintenance of clinical records	3	3	13	19	86.4
SOPs made for OT					
Processes of triage,	2	2	12	16	72.7
Assessment & Admission	3	3	12	18	81.8
Identification of high-risk patients,	3	3	12	18	81.8
Referral, Medication management	2	2	12	16	72.7
Maintenance of clinical records	3	3	12	18	81.8
Implementation of followings					
Clinical Guidelines	3	3	11	17	77.3
Labour Room Clinical Pathways	3	3	12	18	81.8
Referral Protocols	3	3	12	18	81.8
Safe birth checklist	3	3	13	19	86.4
Surgical safety checklist.	3	3	13	19	86.4
Staff working in the labour room and maternity OT					
Non-rotation of nurses followed	1	0	4	5	22.7
LR & OT staff nurses rotated	2	4	0	6	27.3
Initiated Quality Improvement cycles	2	3	13	18	81.8
Number of facilities visited	**3**	**5**	**14**	**22**	

LaQshya initiative on quality improvement cycles in labour room and maternity OT

Cycle 1: Real-time Partograph generating in all the visited facilities for normal delivery and it has been assured for all normal deliveries as per the facilities in charge staff nurse if there is no dilatation at the time of delivery. However, the shift to electronic Partograph is not been taken place in any visited facilities.

Figure 5: Profile of Cycle 1 and 2 in visited LaQshya facilities (in percentage)

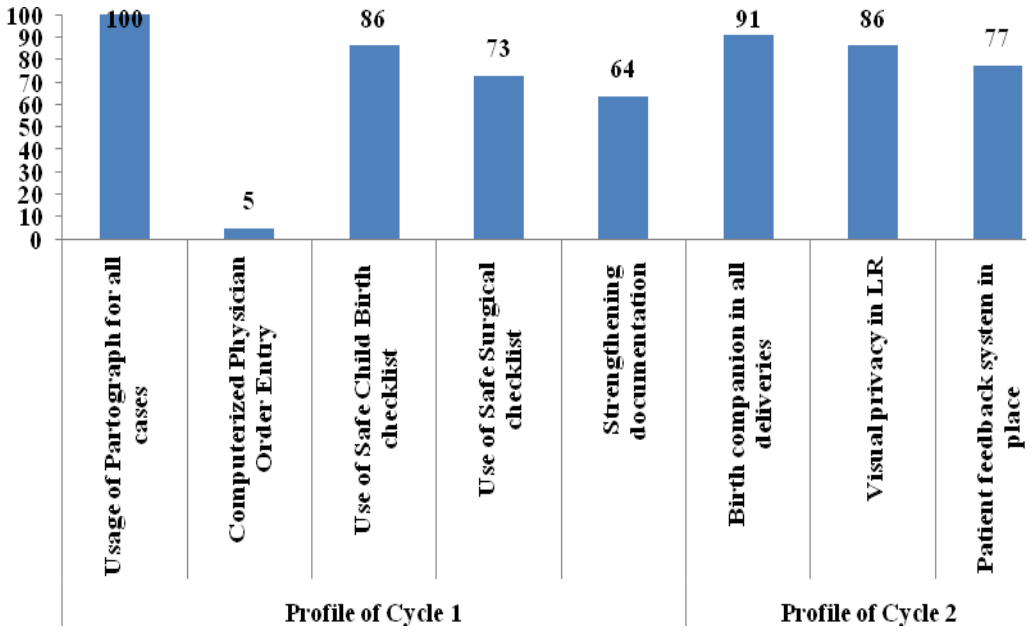
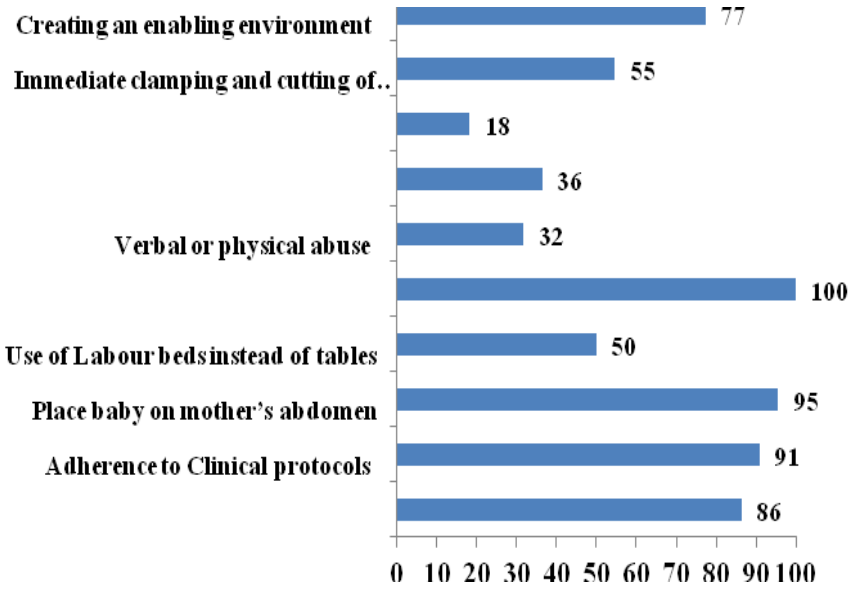


Figure 5 shows that orientation on surgical safety and safe birth check-lists done for all the staff and these checklists are being used in 73-86 percent of visited facilities and strengthening documentation for generating robust data (64 percent) for driving improvement is taking place in fifteen visited facilities and very few facilities have got a computer on a wheel for computerized physician entry (5 percent) (Table 2).

Cycle 2: Presence of Birth companion during delivery, respectful maternity care and enhancement of patients' satisfaction. Figure 5 reveals that seventeen of twenty-two facilities have initiated the presence of a birth companion for only normal delivery (91 percent) and privacy during delivery is ensured in nineteen facilities (86 percent). Seventeen facilities have

initiated patient feedback (77 percent) but there is no regularity in taking beneficiary's satisfaction feedback. Figure 6 shows that almost all the facilities are promoting RMC related to freedom to choose the position for delivery (86 percent), placing the baby on the mother's abdomen (95 percent), avoiding verbal or physical abuse of the pregnant woman (32 percent) and all mothers initiated breastfeeding within an hour, etc. Outdated practices during delivery such as shaving of perineum before delivery, enema given to women, routine episiotomy, routine induction of labour and routine augmentation of labour were not practiced in any visited facilities (Table 2). As per the district, the hospital gynecologist felt that allowing a birth companion during the C- section delivery is difficult as the birth companion interferes with the procedures.

Figure 6: Promotion of Respectful Maternity Care in visited LaQshya facilities (in percentage)



Cycle 3: All the facilities are following the initial assessment, related to triage and timely management of complications including strengthening of referral protocols. Figure 7 shows that five visited facilities have made provision for a separate examination and triage area for the sorting of the cases (23 percent) based on the priority of the cases and a few facilities are in the process of creating space for the separate examination and triage area. Infrastructure related to triage, arrangement of seven emergency trays and privacy is made in 95 percent of the facilities but an audio system for announcements is placed only in three visited facilities (18 percent) and two facilities are using special movable beds (18 percent) to shift the

delivered women from labour to the ward still they are using the statures. Timely management of complications, Management of Pre-eclampsia, eclampsia, and Pregnancy Induced Hypertension (PIH) cases, Management of APH and PPH at Medical College and DHs and Strengthening of referral protocols are made in almost all visited facilities (Table 2).

Figure 7: Profile of Cycle 3, TRIAGE and its infrastructure in visited LaQshya facilities (in percentage)

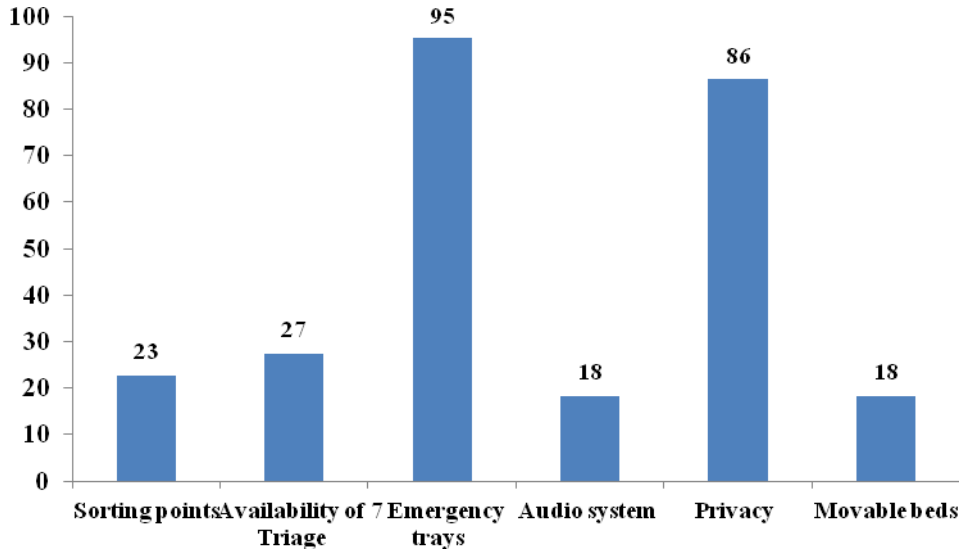


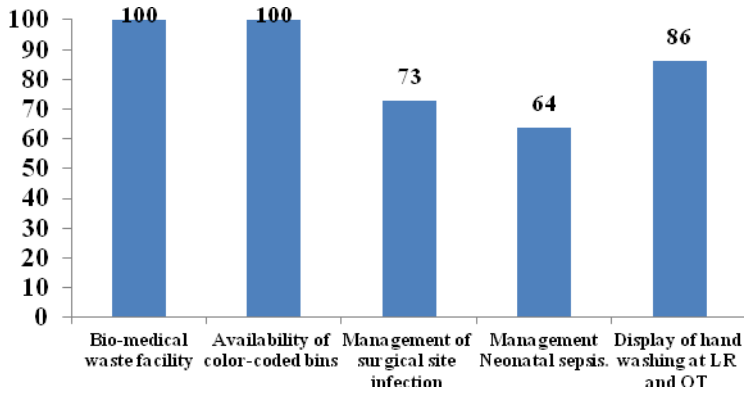
Table 2: Status of LaQshya quality improvement cycles in labour room and maternity OT across the States

Particulars	Karnataka	Jharkhand	Maharashtra	Combined	
				Status	Status in percent
Profile of Cycle 1					
Usage of Partograph for all cases	3	5	14	22	100.0
Use of E Partograph.	0	0	0	0	0.0
Computerized Physician Order Entry	1	0	0	1	4.5
Use of Safe Child Birth checklist	3	5	11	19	86.4
Use of Safe Surgical checklist	3	3	10	16	72.7
Strengthening documentation	1	3	10	14	63.6
Profile of Cycle 2					
Birth companion in all deliveries	2	4	14	20	90.9
Visual privacy in LR	3	4	12	19	86.4
Patient satisfaction/feedback system	2	4	11	17	77.3

Promoting RMC					
Freedom to choose a comfortable position during the birthing	1	5	13	19	86.4
Adherence to Clinical Protocols	3	5	12	20	90.9
Place baby on mother's abdomen	3	4	14	21	95.5
Use of Labour beds instead of tables	2	4	5	11	50.0
Initiation of BF within one hour	3	5	14	22	100.0
Verbal or physical abuse	2	1	4	7	31.8
Induction and augmentation of labour	0	2	6	8	36.4
Insisting on conventional lithotomy position	0	2	2	4	18.2
Immediate clamping and cutting of the cord	2	3	7	12	54.5
Creating an enabling environment	1	4	12	17	77.3
Prevalence of outdated practices					
Shaving of perineum before delivery	0	0	0	0	0.0
Enema is given to women	0	0	0	0	0.0
Routine episiotomy done	0	1	0	1	4.5
Routine Induction of labour	0	0	0	0	0.0
Routine Augmentation of labour	0	0	0	0	0.0
Number of facilities visited	**3**	**5**	**14**	**22**	

Cycle 4: Most of the facilities adopted the Management of Labour as per protocols including Active management of the third stage of labour (AMTSL) and rational use of Oxytocin. However, one of each facility in Jharkhand and Maharashtra has an irrational usage of Oxytocin even before the delivery (Table 3).

Figure 8: Infection Prevention including Biomedical Waste Management in visited LaQshya facilities (in percentage)



Cycle 5: Essential and emergency care of Newborn & Preterm babies including management of birth asphyxia and timely initiation of breastfeeding are initiated in almost all the facilities, except UPHC in Karnataka and one RH in Maharashtra. Visited twenty facilities (91 percent) equipped with Kangaroo Mother Care (KMC) for preterm newborns. District hospitals and Medical College and hospitals are equipped with the Sick Newborn Care Unit (SNCU) and Intensive Care Unit (ICU) for the newborn care and Newborn Stabilization Unit (NBSU facilities at SDH and Newborn Care Corner (NBCC) in the remaining facilities (Table 3).

Cycle 6: Infection Prevention including Biomedical Waste Management.

General cleanliness in the visited health facilities is good in labour room and OT and well equipped. Regular fumigation and autoclaving are being done. Management of biomedical waste is functioning smoothly in all visited LaQshya facilities and it is being outsourced to a private agency. It is observed that specified color-coded bins were placed in the labor room and maternal OT in all visited facilities. The proper segregation of waste process is taking place, protocol posters are available and staff had undergone BMW training, so they are aware of the proper segregation and disposal of biomedical waste. Services for the management of surgical site infection (73 percent of the facilities) and management of neonatal sepsis (64 percent of the facilities) are available in fourteen visited facilities and 86 percent of the facilities are of having hand washing instructions at LR and OT (Table 3).

Table 3: Status of LaQshya quality improvement cycles in labour room and maternity OT across the States

Particulars	Karnataka	Jharkhand	Maharashtra	Combined	
				Status	Status in percent
Cycle 3 TRIAGE and its infrastructure					
Assessment and sorting points	1	1	3	5	22.7
Availability of Triage	1	1	4	6	27.3
Seven emergency trays,	3	5	13	21	95.5
Audio system for announcements,	1	0	3	4	18.2
Privacy	3	4	12	19	86.4

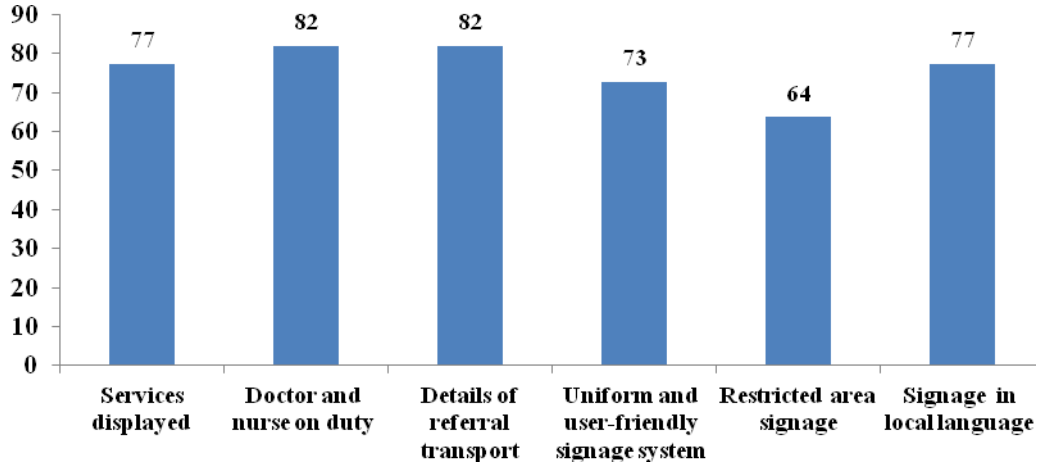
Special movable beds	0	2	2	4	18.2
Timely management of complications					
Pre-eclampsia Cases	2	2	13	17	77.3
Eclampsia Cases	2	2	13	17	77.3
PIH Cases	2	2	13	17	77.3
APH Cases	2	2	13	17	77.3
PPH Cases	2	3	13	18	81.8
Strengthening of referral protocols	2	5	14	21	95.5
Cycles 4, 5 and 6					
Management of Labour as per protocols & use of Oxytocin.	3	4	13	20	90.9
Essential and emergency care of Newborn & Pre-term babies					
Functional Newborn care corner	3	4	13	20	90.9
Management of birth asphyxia	3	4	14	21	95.5
Breastfeeding initiated within 1hr	3	5	14	22	100.0
KMC for a preterm newborn.	2	4	14	20	90.9
Infection Prevention including Biomedical Waste Management					
Bio-medical waste Management	3	5	14	22	100.0
Availability of color-coded bins	3	5	14	22	100.0
Management of surgical site infection	2	2	12	16	72.7
Management Neonatal sepsis.	2	2	10	14	63.6
Display of hand washing instruction at the point of use (LR and OT)	3	3	13	19	86.4
Number of facilities visited	**3**	**5**	**14**	**22**	

Signage, Contact details and IEC-related LaQshya initiative

Seventy-three to 82 percent of the facilities are having Information regarding services, names of doctors and nurses on duty, contact details of referral transport/ambulance available and signage displayed in the local language. Skill assessment of all staff of LR and Maternal OT through Objective Structured Clinical Examination(OSCE), 24x7 availability of Blood transfusion services, diagnostic services, drugs & consumables and IEC material displayed at all visited facilities but the use of aggressive IEC, user-friendly training materials, uniform and user-friendly signage system quality obstetric, newborn care, sensitizing care-providers for delivery of respectful maternity care, audit of all cases of maternal/neonatal deaths,

stillbirth and restricted area signage is made in seventeen visited facilities. An audit for 'C' Section delivery is being done only in four visited facilities. Grievance Redressal Help Desk is working in seven visited facilities and also using quality tools for prioritization. Seven facilities have the facility to capture beneficiaries' independent feedback for the quality services and Out of Pocket Expenditures (OOPE) are being reported in four visited facilities (Table 4).

Figure 9: Services display and Signage system in visited LaQshya facilities (in percentage)



During the discussion with the district coaching team, it was noticed that only medical college in Karnataka, District Hospital, two SDHs and four RHs in Maharashtra State and Gumla District Hospital in Jharkhand State have met long term targets and the remaining visited facilities have fulfilled the short-term targets and need to fill the gaps to meet the middle and long term targets.

Table 4: Status of Signage, contact details and IEC related to LaQshya across the States

Particulars	Karnataka	Jharkhand	Maharashtra	Combined	
				Status	Status in percent
Services displayed	3	4	10	17	77.3
Uniform and user-friendly signage system	2	4	10	16	72.7
Restricted area signage	2	2	10	14	63.6

Name of the doctor and nurse on duty displayed	3	4	11	18	81.8
Contact details of referral transport	3	4	11	18	81.8
Signage and information are in the local language	3	4	10	17	77.3
IEC material displayed	3	3	12	18	81.8
Use aggressive IEC & training material	2	1	6	9	40.9
Dakshata training completed	3	5	14	22	100.0
Skill assessment of all staff through OSCE	3	3	10	16	72.7
Quality obstetric and newborn care.	2	1	6	9	40.9
Functional HDU/ICU	1	0	1	2	9.1
Sensitizing care providers for delivery of RMC	2	2	4	8	36.4
24X7 Blood transfusion diagnostic drugs & consumables	3	3	13	19	86.4
Audit of maternal/neonatal deaths, stillbirth, etc.	2	0	9	11	50.0
Audit of 'C' Sections	1	0	3	4	18.2
Capturing of beneficiaries' independent feedback	2	3	2	7	31.8
Grievance Redressal Help Desk	1	3	3	7	31.8
Using Quality tools for prioritization	1	1	2	4	18.2
Out of Pocket Expenditures (OOPE)	0	3	1	4	18.2
Number of facilities visited	**3**	**5**	**14**	**22**	

Beneficiary's perspectives on RMC

Altogether, we interviewed 69 delivered women from 22 visited health facilities. All women were from the local areas and a few were from *neighboring villages/areas* and their ages were between 18 to 25 years. Sixty percent of the women have reached facilities by 108 ambulances. Out of 69, a total of 48 normal deliveries were conducted and 21 C-section deliveries took place in LaQshya facilities. 80 percent of the women expressed that the

hospital staff encourage walking, moving around, and changing position during labour and adequate circulation area for moving. All delivered women have told that nothing was given to the baby to eat or drink within the first hour after delivery. Almost all mothers have breastfed their babies within the first hour of birth and half of the deliveries were conducted in presence of the birth companion of a household member during labour in labour room but none of the birth companions were allowed during C-section deliveries in all visited facilities. None of the women have reported outdated practices such as shaving of perineum before delivery, enema given to delivering women, routine episiotomy, and routine induction of labour in all cases and routine augmentation of labour in any visited facilities. Sixty-eight percent of the beneficiaries expressed that they do have not to spend any money for services. The study also collected the overall satisfaction with cleanliness and the services provided by the facilities. Patient satisfaction is a key part of the quality of care (Donabedian, 1966). The study found that 88 percent of the delivered women were highly satisfied with the cleanliness of the health center and the quality of services provided. 93 percent of women felt the carefulness of health workers in the facility during their deliveries. 97 percent of them had visited LaQshya facilities and completely trust health workers' decisions about medical treatments. 99 percent of them have felt health workers in the health center are very friendly and approachable. 80 percent of the beneficiaries have been satisfied with the skill and competency of the doctors. 90 percent of them have opined that staff are friendly and courteous, 77 percent of delivered women opinion that satisfaction with the location of the facility and 88 percent of the women had satisfaction with the timing of the services and 15 percent of the women have given suggestions for the further improvement in the hospital such as the need of hot water for bathing, more number of toilets and filter water for drinking.

Conclusion and policy implications

- LaQshya initiatives are significantly contributing to giving the quality of services in certified LaQshya facilities and State level-assessed facilities in the study districts.

- All the facilities were reorganized as per 'Guidelines for Standardization of Labour Rooms at Delivery Points'. None of the labour rooms has staffing as per defined norms in visited LaQshya facilities;
- All the facilities are facing shortages of specialists and staff nurses. The district-level LaQshya team has to ensure adequate HR in LaQshya facilities and should follow the non-rotation of staff nurses, those who have deployed in Labour room and maternal OT.
- All visited facilities, labour rooms and OTs have been equipped with the necessary equipment and reported zero stock-outs of drugs and consumables.
- LaQshya skills lab/Dakshata training for staff nurse have improved their skills, increased their confidence level and also a reduction in referrals and still needs to be trained remaining staff.
- Visited Labour rooms & Maternity OTs and assessed their quality and staff competence using defined National Quality Assurance Standards (NQAS) checklists.
- Almost all facility staff are trained on the latest labour room protocols, and quality improvement processes and respectful maternity care and delivery are being conducted in presence of the birth companion.
- The district mentoring team should ensure the use of the safe birth and Safe Surgery checklist as per the guideline.
- The LaQshya facilities with Pediatricians, SNCUs and NBSUs are managing the new-born asphyxia and sepsis for inborn deliveries and the remaining facilities are referring the cases to the nearest SNCU and it was also noticed that all facilities have shown a reduction of stillbirths.
- The majority of the women have the opinion that the availability of the services under LaQshya was satisfactory.
- Labour rooms at Ahmednagar (Maharashtra) and Gumla (Jharkhand) districts hospitals achieved LaQshya certification and the medical college and hospital in Karnataka labour room are linked to Obstetrics HDU.
- Overall LaQshya initiatives are better implemented in Maharashtra compared to Karnataka and Jharkhand State.

- Need to upgrade Labour rooms as per the guideline at non-certified as well as non-State level assessed facilities.
- Specialists and staff nurses have to deploy and non-rotation of the staff should be followed in labour room and maternity OT.
- LaQshya's coaching team needs to be monitored to certify by targeting the identified gaps in the facilities.

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