

**SOCIOLOGICAL ANALYSIS OF MATERNAL MORTALITY AND
EFFECTIVENESS OF MATERNAL NEWBORN AND CHILD HEALTH
(MNCH) PROGRAM IN RURAL AREAS OF HYDERABAD**

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ABSTRACT

Maternal Mortality Ratio (MMR) was one of priority goal among Millennium Development Goals (MDGs) of United Nations till 2015. Following to MDGs it is again considered as a priority goal in Sustainable Development Goals (SDGs) set by United Nations, which are supposed to be achieved by 2030. As per SDGs, MMR should be reduced at the level of 71 deaths at per 100,000 live births during a specific time period. Though, Sindh Government couldn't achieve its specific target for 2015, instead of running Maternal Newborn and Child Health (MNCH) program at grass root level. This study aims to find out the sociological barriers such as, issue of availability of health workers and access to these health workers by poor people to reduce MMR in rural areas. An exploratory study was conducted using mix methods (qualitative and quantitative) in-depth interviews with mothers and key informant interviews with local maternal health workers including lady health visitors/workers, lady doctors and traditional birth attendants were conducted. A total of 60 mothers and 45 health care professionals were interviewed from different rural areas of Hyderabad division. Semi-structured interview guide was developed having quantitative and qualitative questions.

During interviews with key informants, 53.3% respondents said that there has been maternal mortality under their supervision due to different types of complexities. Whereas, access to health workers is not major issue, 4.4% of people approach to health by foot, 35.6% use public transport and rest avail services at home. But the actual problem is availability of professional health workers those could handle deliveries. Only 11.2% interviewed health workers were professional in gynecology. High frequency of poor people (13) is covered by LHVs and second majority (12) is covered by LHWs. Only (5) gynecologists said that they have treated poor families (having income <2 USD per day) as per defined by World Health Organization (WHO).

During interviews with community, 60.9% respondents said that health facility is not available nearby their village. These respondents (60.9%) said that there had been maternal deaths due to unavailability of professional maternal health workers near to their village. According to community

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73.4% people experiences problems in accessing health workers or facilities. Whereas, 26.6% respondents did not have had any problem to access health workers or facilities. 73.4% respondents said that there had some maternal deaths in their village due to difficulty in accessing professional maternal health facilities or workers on right time.

Keywords: Maternal Mortality, Hyderabad, Maternal Health Workers, MNCH, Availability of Maternal Health Workers, Accessibility of Maternal Health Workers.

INTRODUCTION

This study is focused on Maternal Mortality Ratio (MMR) in rural areas of Sindh province of Pakistan and how much it is reduced through government (MNCH) program. The MMR is a priority problem for developing countries including Pakistan, it had high priority in MDGs and it is reiterated in SGDs. It is found during different studies conducted on MMR that instead of launching mega projects by government and Non-Government Organizations (NGOs) MMR is not reduced at satisfactory level. In Sindh specifically in rural areas, the focus of prenatal and postnatal health care is on babies, whereas, health of mothers is rarely considered.

The issues like poverty, deprivation, gender imbalance and social exclusion are rampant in rural communities. Pakistan's rural community, as in any other under-developed country, is largely poor. Sindh is the second largest province of Pakistan in terms of population. On ladder of social hierarchy women are on at disadvantaged positions. Therefore, mothers of marginalized communities will be focused from rural areas of Hyderabad division, Sindh. Including collection of community responses opinion or key informants opinion was also be sought about their role and community initiative to save lives of women. Including government and other agents work on maternal health, community importance to women has vital role to control maternal mortality ratio.

REVIEW OF LITERATURE

In 2011 National Nutrition Survey, Sindh appeared as the poorest and food deprived province as only 28% households were food secure and the rest 72% households were found to be food insecure. Out of these (72%) 21.1% is food insecure without hunger, 33.8% were food insecure

with moderate hunger and 16.8% were food insecure with severe hunger (National Nutrition Survey, 2011).

While a drop in maternal mortality has been seen in Sindh from an estimated 349 in 2003 to 314 in 2006-07, however, it remains much higher than the national MMR, which were 276 in 2008 (uncertainty range 230-587). Coverage of maternal services in Sindh remains sub-optimal with only two thirds of pregnant women receiving antenatal care, less than half delivering at a health facility; while only a third receive post-natal care (Shah *et.al.*, 2009).

Though the government has deployed MNCH workers in villages to visit door to door and conduct antenatal checkups. But, it is felt that this practice has further make community depending on MNCH workers rather to take proactive measure at their end. MNCH indicator survey says that, nearly 82% of women received only one antenatal care checkup during nine months pregnancy. Study explore further about who has provided the service, it was found that 70% of antenatal checkups are provided by private health services. Study found that 55% deliveries were attended by skilled birth attendants out of these 13% were conducted in private health facilities. Study explores further the rate of postnatal checkups and it's found that 54% of women go for a postnatal check-up during first two days after delivery (Mother and Child Health Program Indicator Survey Sindh Province, 2013).

According to research conducted by Zia-u-din Medical University on maternal health care in rural areas of Pakistan with 443 women who experienced complications, only 37% were referred to an appropriate Emergency Obstetric Care (EOC) facility and 30% were referred to facilities where EOC was not available. Thirty-three percent of women were not referred at all. The 296 women who were referred for EOC, 79% used a car or a taxi to reach the referred facility. Animal driven carts were used by 9% and 1% had to walk to get to an EOC facility. The remaining (11%) used some other form of transportation, including motorcycles, cycles, public buses, etc. None of them had used an ambulance (Safdar *et.al.*, 2002).

The most frequent antenatal care providers were female doctors (55%). Majority (67%) of women had delivered at home with the assistance of traditional birth attendants (TBAs). Estimated annual maternal mortality ratio was 689/1 00,000 live births. Thirty-three percent of women were not referred at all. Females had significantly better knowledge ($p < 0.001$) than their male counterparts. A high proportion of

men (86%) and women (88%) correctly knew the location of healthcare facility where EOC was available (Ambreen *et.al.*, 2015).

According to research conducted by Liaquat University of Medical and Health Sciences on socio-demographic characteristics and the three delays of maternal mortality. The projected maternal mortality ratio was 1650/100,000 live births. The mean age was 28 ± 6.2 years and median parity was two. Seventy-one women (68%) were uneducated, 65 (62.5%) belonging to lower socioeconomic class and 60 (58%) had received no antenatal care. Ninety-eight women (94%) had one or more delays, with 70 (71%) having the first delay, 73 (74%) having the second delay and 47 (48%) the third delay. High ratio of maternal mortality was found in women of age 29-39 years. Thirty-five (48.6%) maternal deaths occurred at tertiary care hospitals, while 20 (27.8%) and 16 (22.2%) took place at home and on the way to hospital respectively (Rashid, 2010).

The reproductive risk index which scores countries separately on the percentage of women is receiving prenatal care. The percentage of births attended by skilled personnel is 52.7 and risk index ranking is 37, while in neighboring country Sri Lanka, 94% births are attended by skilled personnel and risk index ranking is 28.4 respectively (Inam & Khan, 2002).

A total of 134 women who came for delivery were included in the study. Out of these, 71 women had received antenatal care while 63 did not receive antenatal care. Twenty-eight (44.44%) women did not receive antenatal care because the facility was far away from home, 10 (15.87%) said that transport was not available. Women who received antenatal care were more aware of the dangerous signs and symptoms of pregnancy than women who did not receive antenatal care (Shah *et.al.*, 2009).

During the one year study period, total 2224 deliveries were conducted. Out of these, there were 224 prenatal deaths with PNMR of 100.7/ 1000 births. The risk factors for the prenatal loss are summarized. Main risk factors were ante partum hemorrhage (APH) in 27.67% cases followed by hypertensive disorders of pregnancy (23.211%) and mechanical causes affecting labour (08.48%) (Rashid, 2010).

Age ratio of women studied was like, 2 (3.7%) less than 20 years, 25 (46%) were of 21 to 30. In Pakistan every year over five million women get pregnant out of those 0.7 million (15%) do face some health problems. In Pakistan nearly 80% of the deliveries take place at homes managed by traditional birth attendants (TBAs). Majority of these TBAs are not properly trained even to provide initial medical treatment to women. Study found 31 women those felt the state of shock that require a

quick treatment by health professionals. As per reported by WHO in Pakistan post-partum hemorrhage is nearly 34%. It is insisted to use safe motherhood approaches around the country. Study suggests that all the health workers need to be trained to identify risky pregnancies and their management. General populations also needs to provided maternal health education, sensitization of communities at ground level is necessary. As per the findings of study 61% of women were satisfied with interpersonal aspect of care, management and services while 39% were not satisfied. However, women were not fully satisfied with the availability, accessibility, convenience, knowledge and advices provided by workers. Regarding technical aspect of services it is found that 44% of women were not satisfied whereas 56% of women were satisfied (Ambreen *et.al.*, 2015).

Generally maternal health interventions in Pakistan were designed to increase the supply of services but these lack focus on providing quality services to poor communities. It is necessary to design approaches that overcome financial and socio-cultural barriers and access of poor people to quality services needs to be made sure. Majority of women get married at younger age but difference of age at time delivery is not found as much high. It is found that child death ratio is high among poor people as compare to well off. Poor women also have high rate of childbearing during previous 5 years. Study found that in poor houses most of the women were wives of head of household and they were younger. Size of family was also found bigger in poor communities, for example 9 members in household on average. Utilization of health services among poor women was also very low and compare to women with more economic resources. Routine Antenatal Care (ANC) visits were common among women with well-off economic background, whereas poor women do pay any ANC visit in case of problem (Agha, 2014).

It is estimated that 21% of the population live below the poverty line in Pakistan, there are other aspects of poverty as well such as food insecurity and under nutrition. Further, there are differences in socio-economic life patterns across provinces and districts. The vicious cycle of population growth, poor mother and child health outcomes and nutrition needs urgent attention in Pakistan. Decentralization of health and family planning to provinces is an opportunity for integration of initiatives, such as, MNCH, program on immunization, malaria program and nutrition programs. It is simple to understand that objectives of MNCH and nutrition can be achieved by intervening within health sector. One of the key limitations to take action is lack of accurate and real-time data/

information. There is a need to strengthening district information systems, for example, District Health Information Software, and the creation of guiding information systems for mother and child health (Bhutta, & Hafeez, 2015).

Nearly 33.2% of births were measured out of these 30% are estimated having weight less than 2500 grams. Total fertility rate in rural areas of Sindh is 5.2 per women during fertility age of 15 to 49, overall in urban and rural areas birth rate is 4.0 per woman. Early child bearing is reduced in past 10 years, especially in urban areas. As per survey results 20.7% ever married women between the ages of 45 to 49 gave birth before 18 years, among women age of 20 to 24 years it is reduced at level of 10 percent. It is found that 66.8% women received antenatal care more than once and 41.1% four times during whole delivery, as per standards set of WHO minimum four visit during pregnancy are necessary (Multi Indicator Cluster Survey, 2014).

RESEARCH METHODOLOGY

Research Design: Research design is an overall strategy for collection of data, analysis of data and reporting the data (Daymon & Holloway, 2005).

This is an operational study because it aims study government MNCH project. In view of the purpose of the study mix methods are used.

Mix methods (qualitative/quantitative) helps researcher in data triangulation or in observation of a social phenomenon/ problem from different aspects.

In mixed methods research the quantitative and qualitative data can be interpreted in different manners for proper understanding of social problem (Denscombe, 2008).

Tools of Data Collection: Two types of data collection tools were used in study to collected data from different sources. For example, in-depth Interview guide was used to collect data from mothers and Key Informant Interview guide was used to collect data from maternal health workers.

Methods of Data Collection: Two types of data collection methods are used, in-depth interview from mothers and key Informant Interviews with locally available maternal health workers.

Interview Schedule Method was applied to conduct in-depth and Key Informant Interviews (Laxmi devi, 2002).

Method of Sampling: Though the targeted respondents of study were pre-defined such as, maternal health workers in rural areas of Hyderabad and mothers from rural communities. Therefore, non-probability purposive sampling is applied as a sampling technique (Plays, 2008).

Size of Sample: Sample size is calculated online through Raosoft Sample Size Calculator.

Calculation of sample size:

Margin of error	5%
Level of confidence	95%
Population size	6,829,537
Response distribution	50%
Size of sample	385

PARTICIPANTS' DETAILS

District	Mothers	Maternal Health Workers
Badin	42	5
Dadu	43	5
Hyderabad	42	5
Jamshoro	43	5
Matiyari	42	5
Sujawal	43	5
Tando Allahyar	44	5
Tando Muhammad Khan	43	5
Thatta	43	5
Total	385	45

DATA ANALYSIS

Data analysis is a systematic organization of research data and testing research hypothesis using findings (Polit & Hungler, 1999).

There were two types of data collection during research, quantitative using structured close ended questions and qualitative using semi or unstructured open ended questions. Quantitative data was analyzed by using Statistical Package for Social Sciences (SPSS) and qualitative data was analyzed using NVIVO software. Descriptive statistics, simple tables, figures and contingency tables are drawn from data to present research findings.

Since hypothesis were developed in study, therefore, null hypothesis were formulated that stated that no any relation exist between two variables. The preferred level of significance was 0.05. A significant difference got on every dependent variable with maternal mortality ratio. For example: unavailability of maternal health workers, inaccessibility to

maternal health workers, malnutrition among women, educational status of women, and early marriages of girls.

STATISTICAL METHODS OF DATA ANALYSIS

For representing research findings the simplest form is the distribution of percentage. Different statistical inferences were drawn for the purpose of confirming the validity of hypothesis, as statistical inference helps to find out the significance of the variables. For the purpose of hypothesis testing chi-square tests are conducted. All hypotheses are tested as per P value and chi-square value (calculated and tabulated against degree of freedom).

CHI-SQUARE

In present study for finding out the relationship between two variables Chi-square test has been used. In sociological studies chi-square test is the simplest statistical method which is effectively used to find out the existence of relationship between the independent and dependent variables of a hypothesis.

Formula for chi-square:

$$X^2 = \frac{(f_o - f_e)^2}{f_e}$$

The comparisons of the calculated results with tabulated results determine the degree of freedom. When the calculated value is higher and the tabulated value is lower, in this case the null hypothesis is rejected and functioning hypothesis is kept.

FINDINGS

Key Informant Interviews: Research question-1 Do the available maternal health facilities are controlling maternal mortality ratio?

Theme-1 Unavailability of Maternal Health Workers and Maternal Mortality

TABLE-1					
Q1-F PROFESSION/ PROFILE OF RESPONDENT					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gynecologist	5	11.1	11.1	11.1
	LHV	16	35.6	35.6	46.7
	LHW	14	31.1	31.1	77.8
	TBA	10	22.2	22.2	100.0
	Total	45	100.0	100.0	

Table-1 above shows the professions of frequently available health workers in rural areas of Hyderabad division. High proportionate of health worker (35%) are the lady health visitors (LHVs) affiliated with government projects. Second high proportionate (31%) are the lady health workers (LHWs). Only five 11.2% are the highly professional gynecologists and 21.1% are untrained traditional birth attendants (TBAs).

FIGURE-1

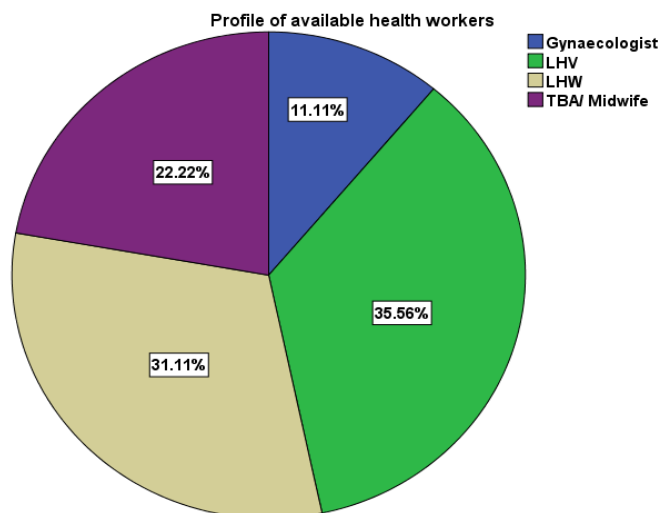


TABLE-2

Q-6-J ANY MATERNAL DEATH DURING DELIVERY OR PRE/POST ONE MONTH OF DELIVERY

	Frequency	Percent	Valid Percent	Cumulative Percent
No	41	91.1	91.1	91.1
Valid Yes	4	8.9	8.9	100.0
Total	45	100.0	100.0	

Table-2 above interprets the result of very important question of study “at what extend the availability of health workers at the time of live birth can save the life of women?” Majority of respondents (91.1%) said that despite of difficulties in handling complicated deliveries there were no any maternal mortality.

Research question-2 does the accessibility to maternal health workers is controlling maternal mortality ratio?

Theme-2 Inaccessibility to maternal health workers and Maternal Mortality

TABLE-3
Q-5.1 HOW PEOPLE CAN ACCESS HEALTH FACILITY
OWNED BY RESPONDENT

	Frequency	Percent	Valid Percent	Cumulative Percent
By foot	2	4.4	4.4	4.4
No health facility	25	55.6	55.6	60.0
Personal transport	2	4.4	4.4	64.4
Public and private transport	16	35.6	35.6	100.0
Total	45	100.0	100.0	

Table-3 portray the situation of access to maternal health workers by communities in rural areas. Though the responds were frequently dealing with poor and very poor communities, the difficulties in access can be understood from the means of access. Majority of respondents (55.6%) actually do not have a maternity home so this is excluded from discussion. High proportionate (35.6%) access health facility via public or private transport. Which indicates that maternal health facilities are very distant, scattered population and low number of maternal health facilities which indicates the availability also effect the accessibility. Very few numbers of peoples (4.4%) those use personal transport can also be included among people facing difficulty in accessing health facilities.

FIGURE-2

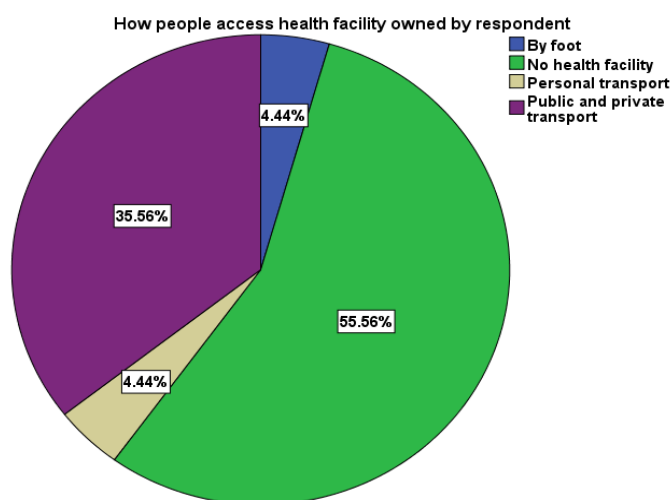


TABLE-4

Q-1.F AND Q-4.D PROFESSION V/S FREQUENT WEALTH GROUP COVERED, CROSS TABULATION

		Frequent wealth group covered			Total
		Middle	Poor	Very poor	
Profession	Gynecologist	0	5	0	5
	LHV	3	6	7	16
	LHW	2	4	8	14
	TBA/ Midwife	3	2	5	10
Total		8	17	20	45

Table-4 Above shows the different wealth groups accessed by different professionals of mother and child health. It is found high frequency of poor and very poor people ($6+7=13$) is covered by LHVs and second majority ($4+8=12$) is covered by LHWs. Whereas, traditional birth attendants have covered ($2+5=7$) poor and very poor families. Only (5) gynecologists said that they have treated poor families. As compare to middle class people, poor and very poor people are more frequently covered by all types of maternal health workers.

TABLE-5
Q-4.P ANY MATERNAL DEATH DUE TRANSPORT/ ACCESS ISSUE

	Frequency	Percent	Valid Percent	Cumulative Percent
DK	2	4.4	4.4	4.4
No	32	71.1	71.1	75.6
Valid Yes	11	24.4	24.4	100.0
Total	45	100.0	100.0	

Table-5 above shows the frequency of maternal deaths due to unavailability of transport as per the knowledge of respondents. 71.1% said that they know any maternal mortality happened due to unavailability of transport. 24.4% said that maternal deaths happened due to unavailability of transport at the time of delivery, 4.4% respondents said that they do not know if any maternal death has happened due to unavailability of transport.

SIMPLE TABLES, INTERVIEWS CONDUCTED FROM COMMUNITY

TABLE-6
Q2-A AVAILABILITY OF MNCH WORKERS NEARBY

	Frequency	Percent	Valid Percent	Cumulative Percent
No	75	19.5	19.5	19.5
Valid Yes	310	80.5	80.5	100.0
Total	385	100.0	100.0	

Table-6 shows the availability of maternal health workers near to the villages. Majority of respondents (80.5%) said that the health workers available near to their villages. Whereas 19.5% respondents said that there is no any maternal health worker or facility near to their villages. Though, this questions has found smart number of availability of maternal health workers but this doesn't make sure the reduction in maternal mortality.

FIGURE-3
AVAILABILITY OF MATERNAL HEALTH WORKERS

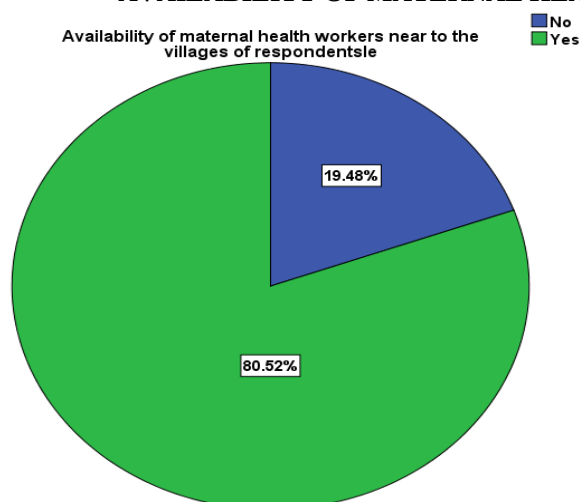


TABLE-7
Q2-D HEALTH FACILITY OPEN ROUND THE CLOCK

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	97	25.2	25.2	25.2
	Yes	157	40.8	40.8	66.0
	N/A	131	34.0	34.0	100.0
	Total	385	100.0	100.0	

Table-7 shows the timing of available maternal health facilities. High proportion of respondents (40.8%) said the health facilities open round the clock, 25.2% respondents said the health facilities do not work round the clock. Whereas 34.0% respondents said that there are no any health workers or facility near to their village. It can be concluded that only 40.8% households have security regarding maternal health care.

TABLE-8
Q2-G WOMEN DIED DUE TO UNAVAILABILITY OF HEALTH WORK ON TIME

	Frequency	Percent	Valid Percent	Cumulative Percent
No	307	79.7	79.7	79.7
Valid Yes	78	20.3	20.3	100.0
Total	385	100.0	100.0	

Table-8 shows the reasons of maternal mortalities in rural areas as told by women. It was found that majority of women (79.7%) said that no any women died due to the unavailability of maternal health workers in their villages. Whereas, 20.3% women said that maternal mortalities happened in their villages due to unavailability of maternal health workers. It can be concluded that availability of maternal health workers can reduce the maternal mortalities up to 20.3%. If, government deploys maternal health workers in all areas, round the clock, still there can be risk of maternal mortalities up to 20.3%.

FIGURE-4
MATERNAL MORTALITIES DUE UNAVAILABILITY OF MATERNAL HEALTH WORKERS

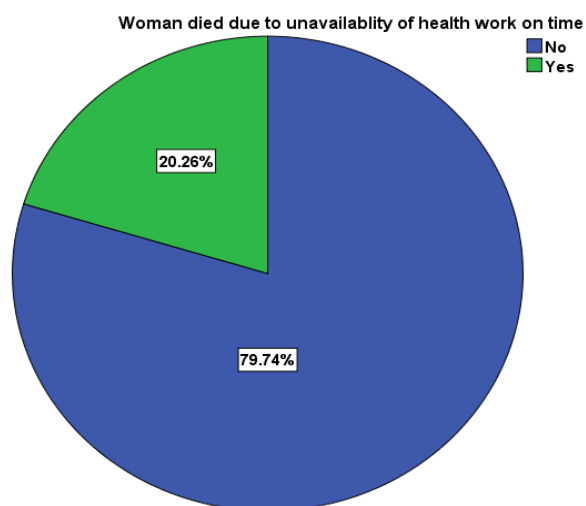


TABLE-9				
Q3-C ACCESS FREQUENCIES				
		Responses		Percent of Cases
		N	Percent	
Ways to access health facility	By foot	182	37.3%	48.3%
	By public transport	91	18.6%	24.1%
	By rented vehicle	136	27.9%	36.1%
	By personal transport	79	16.2%	21.0%
Total		488	100.0%	129.4%
a. Dichotomy group tabulated at value 1.				

Table-9 shows the means of accessing to maternal health workers by poor communities of rural areas. High proportion of women (37.3%) access maternal health workers by foot. 27.9% access by rented vehicle, 18.6% access by public transport and 16.2% access through personal transport.

TABLE-10
QC-E FACED ANY PROBLEM IN ACCESS

	Frequency	Percent	Valid Percent	Cumulative Percent
No	284	73.8	73.8	73.8
Valid Yes	101	26.2	26.2	100.0
Total	385	100.0	100.0	

Table-10 shows the percentages of women those faced problem in accessing health facility on time. Majority of women (73.8%) faced different types of problems to access health facilities and 26.2% women did not face any problem accessing to health facility. If compare the results of table-22 with table-21, we can see that only 37.3% women access health facility by foot rest of others use transport. Therefore, it can be concluded that availability of maternal health workers near to villages cannot make sure safe access of them.

FIGURE-5
PROBLEMS IN ACCESSING MATERNAL HEALTH WORKERS

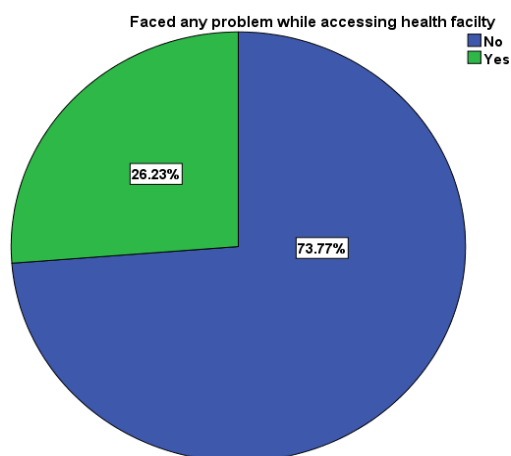
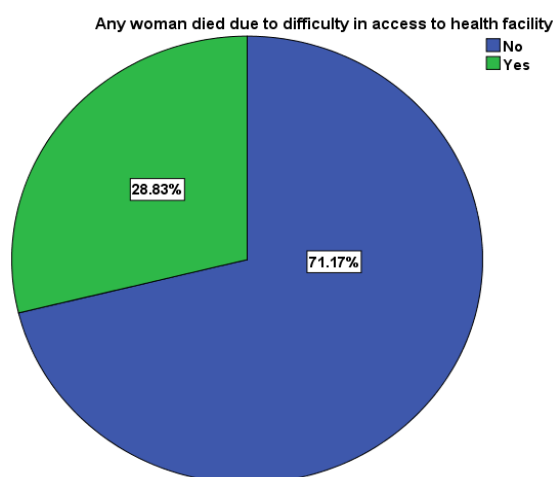


TABLE-11
Q3-H ANY WOMAN DIED DUE TO DIFFICULTY IN ACCESS TO HEALTH FACILITY

	Frequency	Percent	Valid Percent	Cumulative Percent
No	274	71.2	71.2	71.2
Valid Yes	111	28.8	28.8	100.0
Total	385	100.0	100.0	

Table-11 shows the reasons of maternal mortalities in rural areas as told by women. It was found that majority of women (71.2%) said that no any maternal death happened in their villages due to the inaccessibility of poor communities to maternal health workers in their villages. Whereas, 28.8% women said that maternal mortalities happened in their villages due to inaccessibility of poor communities to maternal health workers. It can be concluded that safe access to maternal health workers or facilities can reduce maternal mortality ratio up to 28.8% but still there are other factors those needs to be worked.

FIGURE-6
MATERNAL MORTALITIES DUE TO DIFFICULTY IN ACCESS



RESULTS OF STATISTICALLY TESTED HYPOTHESIS

Hypothesis: 1

H_a : Unavailability of maternal health workers in rural areas is likely to be affecting maternal mortality ratio.

H_o : There is no relationship between unavailability of maternal health workers in rural areas and maternal mortality ratio.

TABLE-12					
WAS HEALTH FACILITY CLOSED DURING ANY DELIVERY * WOMAN DIED DUE TO UNAVAILABILITY OF HEALTH WORK ON TIME, CROSS TABULATION					
			Woman died due to unavailability of health work on time		Total
			No	Yes	
Was health facility closed during any delivery	No	Count	219	0	219
		Expected	174.6	44.4	219.0
	Yes	Count	88	78	166
		Expected	132.4	33.6	166.0
Total		Count	307	78	385
		Expected	307.0	78.0	385.0

Table-12 is a contingency table that explains the figures of two questions against each other. If we see there are two questions in table and response of both are dichotomous. One question asks about if the health facility nearby village was closed while any particular delivery. And there are two responses in row there are number of women checked “No” and in row two there number of women checked “Yes”. Against responses of that question the responses of other question are given in columns. The question explores that if the maternal health facility was closed or health worker was not available on time of delivery than women died or not. If we see the expected count and actual count of women those said “Yes” the woman died while health facility/ was not available. It can be seen that expected count of women deaths due to unavailability of health worker or facility is low as compare to actual count. Therefore, it can be concluded that there is relationship between unavailability of maternal health workers and maternal mortality ratio. Thus, the null hypothesis is rejected and research hypothesis is accepted. Further the following table will show results of “P” value and Chi-square tests.

TABLE-13 CHI-SQUARE TESTS					
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	129.049 ^a	1	.000		
Continuity Correction ^b	126.156	1	.000		
Likelihood Ratio	158.544	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	385				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 33.63.					

As the significance value 0.05 is higher than P value .000, therefore null hypothesis cannot be accepted by researcher, As a result it is concluded that there exists relationship between unavailability of maternal health workers and maternal mortality ratio. In other words the computed value 129.9 is larger than the tabulated value (3.841) therefore, null hypothesis is rejected.

A test of independence is a chi-square technique used to determine whether two variables are related or independent. In the present research chi-square test of independence is applied on the data of contingency

Table No. 13 to determine the independence of the two variables “Unavailability of maternal health workers and maternal mortality ratio”.

129.9 is the calculated value of chi-square drawn from Table no. 13 including 1 degree of freedom. That indicates H_a is accepted and H_o is rejected. The p-value is .000, therefore, it can be concluded that there is strong degree of association between two variables “Unavailability of maternal health workers and maternal mortality ratio”. Keeping in view the aforementioned data, it can be concluded that H_a : Unavailability of maternal health workers in rural areas as a variable has a significant role in increasing maternal mortality ratio in rural areas of Sindh is accepted as supported by data. Thus, it is clear that there exists a strong interdependence or a significance association between variables concerned.

Hypothesis: 2

H_a : Inaccessibility of rural communities to the maternal health workers is likely to be affecting maternal mortality ratio.

H_o : There is no relationship between inaccessibility of poor communities to the maternal health workers and maternal mortality ratio.

TABLE-14 FACED ANY PROBLEM IN ACCESS* ANY WOMAN DIED DUE TO DIFFICULTY IN ACCESS TO HEALTH FACILITY, CROSS TABULATION					
			Any woman died due to difficulty in access to health facility		Total
			No	Yes	
Faced any problem in access	No	Count	229	55	284
		Expected	202.1	81.9	284.0
	Yes	Count	45	56	101
		Expected	71.9	29.1	101.0
Total		Count	274	111	385
		Expected	274.0	111.0	385.0

Table-14 is a contingency table that explains the figures of two questions against each other. If we see there are two questions in table and response of both are dichotomous. One question asks about if woman faced any problem while accessing to maternal health work or facility. And there are two responses in row there are number of women checked “No” and in row two there number of women checked “Yes”.

Against responses of that question the responses of other question are given in columns. That questions explores that if it is problematic to access the health worker or facility then any woman died while accessing to that maternal health facility of worker. If we see the expected count and actual count of women those said “Yes” the woman died while accessing maternal health facility or worker. It can be seen that expected count of women deaths due to inaccessibility to maternal health worker or facility is low as compare to actual count. Therefore, it can be conclude that there is relationship between inaccessibility of people to maternal health workers and maternal mortality ratio. Thus, the null hypothesis is rejected and research hypothesis is accepted. Further the following table will show results of “P” value and Chi-square tests.

TABLE-15 CHI-SQUARE TESTS					
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	47.265 ^a	1	.000		
Continuity Correction ^b	45.523	1	.000		
Likelihood Ratio	44.506	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	385				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 29.12.					

As the significance value 0.05 is higher than P value .000, therefore null hypothesis cannot be accepted by researcher, As a result it is concluded that there exists relationship between inaccessibility of poor communities to the maternal health workers and maternal mortality ratio. In other words the computed value 47.265 is larger than the tabulated value (3.841) therefore, null hypothesis is rejected.

A test of independence is a chi-square technique used to determine whether two variables are related or independent. In the present research chi-square test of independence is applied on the data of contingency Table No. 15 to determine the independence of the two variables “Inaccessibility of rural communities to maternal health workers and maternal mortality ratio”.

47.265 is the calculated value of chi-square drawn from Table no. 15 including 1 degree of freedom. That indicates H_0 is accepted and H_a is rejected. The p-value is .000, therefore, it can be concluded that there is strong degree of association between two variables "Inaccessibility of poor communities to maternal health workers and maternal mortality ratio". Keeping in view the aforementioned data, it can be concluded that H_a : Inaccessibility of poor communities to maternal health workers as a variable has a significant role in increasing maternal mortality ratio in rural areas of Sindh is accepted as supported by data. Thus, it is clear that there exists a strong interdependence or a significance association between variables concerned.

CONCLUSION

Instead of appointing number of maternal health workers, maternal mortality is controlled yet. Nearly half of the maternal health workers said that women were died while cases were not handled by them due to complication. Therefore, it can be concluded that majority of health workers are not fully trained and equipped to deal with complicated delivery cases in context of rural areas. In rural areas of Sindh especially in Hyderabad division infrastructure is not travel friendly. Roads and public transport are very poor to travel for pregnant women. There is always risk of getting proper transport on time in rural areas. Roads are also very dangerous and cause delays in accessing proper maternal health care services in urban areas on time and in safe way. Therefore, it can be concluded that accessing to the maternal health workers cannot be made sure by deploying number of maternal health workers. Infrastructure, transport and decision making by community are also the factor those effects on timely access to maternal health workers so that lives of women can be saved. While testing the hypothesis it is also proved that both of the independent variables (unavailability of and inaccessibility to maternal health workers) of study have significant effect on maternal mortality. If see the findings of previous studies as mentioned in literature review have also almost same conclusions. Maternal Newborn and Child Health (MNCH) program as designed by Sindh government is not effective enough to reduce the maternal mortalities. It needs to be redesigned and aligned with the overall social context of rural areas after a detail study of social dynamics of rural areas and objectives of MNCH program.

Study supports the social, biomedical and feminist models of women health. It is found during study that maternal mortality ratio

cannot be handled until unless; spiritual, psychological, social and biological aspects of women health are not taken into account. Study also supports the nursing models. It is found during the study that deployment of maternal health workers cannot reduce the maternal mortality ratio. There is need to improve care aspect of services provided by maternal health workers.

Study support the findings of research conducted by (Safdar *et.al.*, 2002) that is narrated in literature review. That study says, there is no proper referral mechanism an ambulance in case of complicated delivery in rural areas of Sindh. Study also support the findings of research conducted by (Yousuf *et.al.*, 2010) that is also narrated in literature review. That study says, majority of women in rural areas of Sindh did not receive antenatal care because health facilities are scattered.

RECOMMENDATIONS

- There is need to conduct detailed social survey on socioeconomic context of rural areas and what are the aims of MNCH program.
- Number of trained lady health visitors should be increased in rural areas, and there is need to set a fix criteria about how many households can be covered by each lady health visitor.
- There is need to train and provide equipment to locally available traditional birth attendants.
- There is need to work on community infrastructure and easy transport in rural areas to minimize third delay.
- There is need to develop community sensitization on importance of mother and child health through mass messages or telefilms.
- There is need to develop community awareness regarding prenatal and postnatal nutritional requirements of women.

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