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A Time-and-motion Analysis Of Multipurpose Healthcare Workers And Female Health Workers an Observational Study

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Abstract:
Background/Introduction: Frontline health workers are at the front of health service delivery, especially in rural and difficult-to-reach settings. multipurpose health workers (MPHW) and female health workers (FHW) are the grassroots-level workers in a sub-center. With every new program, there is a need for collecting additional data from the sub-centre area leading to an increase in the workload of these functionaries. This study observes the work-related activity of MPHWs and FHWs in the different domains and also assesses their time utilization pattern.
Objectives: To assess the time utilization pattern among front-line health workers multipurpose health workers (MPHW) and female health workers (FHW)
Material/methods: A cross-sectional observational study using a time-and-motion study design was conducted at all the sub-centers of Valsad taluka. All the Multipurpose health workers (MPHW) and female health workers (FHW) of selected sub-centers included in the study those who are fulfill the inclusion criteria and are willing to give consent.
Result:
A total of all 13 PHCs and their subcenters which are functional from 1 year at least of Valsad taluka were included in this study. Time utilization pattern revealed that Female health workers spent the maximum of their time on maintaining registers followed by Antenatal Care services, followed by vaccination of children, followed by ABHA, and PMJAY card generation which is online data entry, multipurpose health workers utilized a maximum of their time in nvbdcp field survey and field activity, followed by online reporting of data to higher center, followed by Antenatal Care services.
Conclusion: This study represents the workload in different areas of front-line health workers (MPHW & FHW) activities and the various nature of their work, in the significance of their roles and responsibilities in the view of Indian public health standards, The policymakers should frame strategies that would decrease the redundancy of data entries on paper and then online.
Keywords: time and motion analysis, multipurpose health workers(MPHW),female health workers(FHW), antenatal care, front line health worker.

Introduction:

Health functionaries are integral to providing universal health coverage and attaining Health functionaries are integral to providing universal health coverage and attaining Sustainable Development Goals (1, 2). Frontline health workers (FLHWs) or community health workers have been at the forefront of health service delivery, especially in rural and difficult-to-reach settings. Public health practices in India have been ever-changing and witnessed barriers to affect the lives of the people of this country. Multipurpose health workers (MPHWs) and female health workers (FHWs) are the pivotal grassroots-level workers in a subcenter. They are the first point of interaction with the community at the grassroots level, providing all the primary healthcare services (5). A multipurpose health worker (MPHW) and female health worker (FHW) is a frontline health worker and the first point of contact in the healthcare sector. With every new program, there is a need for collecting additional data from the subcenter area leading to an increase in the workload of these functionaries (6). This study observes the work-related activity of MPHWs and FHWs in the different domains and also assesses their time utilization pattern.. Globally, several time-motion studies of facility-based healthcare professionals have been reported; however, the number of comprehensive time-motion studies of community-based health workers, such as Ethiopia's HEWs, is limited (8). A time and-motion study is defined as the independent, constant observation, and recording of activities of staff and the time spent on these activities. In the Cameroon study, productive time included performing administrative tasks, clinical work, promotion/prevention services, and maintaining general hygiene in the health center (10).

The main objective of the study was to understand the role of HCWs in the public health care system in Valsad concerning their job description and actual work practice and to assess the time spent by HCWs in each activity through a time-motion study (11)

METHODOLOGY:-

The study was done after approval from the Sumandeep Vidyapeeth Institutional Ethical Committee(SV IEC). The study was done after the consent of each participant.

It was an observational cross-sectional observational study using a time-and-motion study design conducted at all the subcentres of Valsad taluka. All the Multipurpose health workers (MPHW) and female health workers (FHW) of selected sub-centres included in the study those who are fulfilling the inclusion criteria and were willing to give consent.

This study has two types of front-line workers in health care is multipurpose health workers (MPHW) and female health workers (FHW) who are in the grassroots level of health care services.

For this study, the Valsad district from Gujarat state was selected and out of the selected district Valsad taluka/block was selected randomly, selected talukas's all primary health centers (13 PHCs) and their sub-centers were selected for the study, all multi-purpose health workers and female health workers of that sub centers were selected.

Inclusion criteria for PHC– All PHCs that have been functional for at least last 1 year were included. The list was procured from the district health office of the Valsad district

Inclusion criteria for beneficiary

Multipurpose health workers and female health workers who were on duty.

Exclusion criteria:

- beneficiary who will not give consent,
- a health worker who was on leave more than or equal to 3 days on a selected week

For this study, the random selection of Valsad District was done with the help of a computer-generated random district, and selected Valsad districts Valsad taluka/block were selected randomly by computer.
Valsad taluka/block PHC's multipurpose health workers(MPHW) and female health workers (FHW) were selected for the study
The study was started after ethical approval of institutional ethics committee. The investigator approaches the government officials for permission and other formality. The list were procured for the PHCs and sc.
Once the list was ready the investigator approached the PHCs for process evaluation. The data collection tool made for the study was based on the available norms and guidelines.
CONFIDENTIALITY: Confidentiality of the records of all the participants is maintained.

Result:
A total of all 13 PHCs and their subcentres which are functional from 1 year at least of Valsad taluka were included in this study. out of it 1 PHC was excluded from the study as it was not functional from at least 1 year and not fulfilling the inclusion criteria, so out of total 13 PHCs 12 PHCs were selected for the study (9 Rural PHCs and 3 Urban PHCs). A total of 134 frontline health worker participants were selected out of it 76 were FHW and 58 were MPHW.
All participant's overall mean age is 37 years, MPHWs mean age is 36 year and FHWs mean age is 37 years [Tabel-1]. Frequency of study participants age shows that the highest age group frequency is 30-39 years, while lowest in 50-60 years of age group [Tabel-2].

TABLE-1

Distribution of Study Participants as per Age Group

Age Group	Frequency	%
20-29	13	9.70%
30-39	87	64.93%
40-49	23	17.16%
50-60	11	8.21%
Grand Total	134	100.00%

TABLE-2

Mean age as per Designation

FHW	37.97 years
MPHW	36.67 years
Overall	37.41 years

Time utilization pattern revealed that Female health workers spent the maximum of their time on Mamta day activity followed by travel in the field followed by maintaining registers and online data entry, followed by Antenatal Care services, followed by vaccination of children, followed by ABHA, and PMJAY card generation which is online data entry, multipurpose health workers utilized a maximum of their time in NVBDCP field survey and field activity, followed by Mamta day activity followed by online reporting of data to higher center, followed by travel in field activity. Average time utilization pattern shows that health care

worker spent their maximum time in field activity which is seasonal epidemic surveillance and control measures followed by Mamta day activity which includes maternal and child health care services followed by online data entry and maintaining of registers.

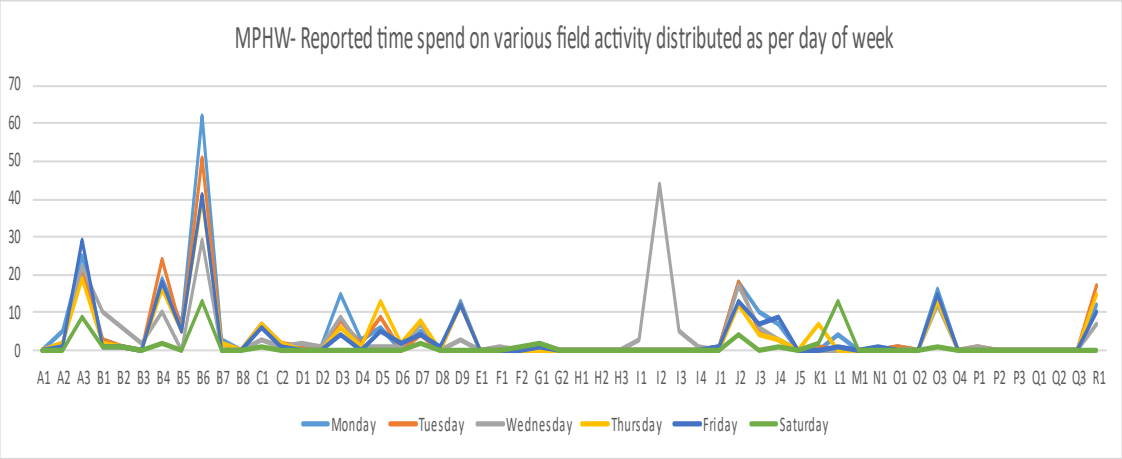

Figure 1

We have divided each sub categorized activity in to the codes for graphical representation [A1: Home to field (to-fro) A2: Home to facility (to-fro) A3: Within field Facility to field (to-fro) B1: Maternal health B2: Child health B3: Nutrition B4: Communicable diseases B5: Non-communicable diseases B6: Seasonal diseases/epidemics outbreak B7: Curative care B8: Blindness/cataract C1: Health checkups C2: Counselling D1: Maternal health D2: Child health D3: Family planning D4: Nutrition D5: Communicable diseases D6: Non-communicable diseases D7: Other health-related D8: Mobilisation D9: Any other E1: No sub-category F1: IEC in schools F2: Service delivery and counselling G1: Service delivery and counselling IEC for adolescents G2: Any other H1: IEC activity on NHD day H2: Service delivery H3: Any other I1: Administrative I2: Service delivery I3: Paperwork I4: Any other J1: Filling up registers J2: Computer data entry J3: Preparing reports J4: Maintaining beneficiary records J5: Any other K1: No sub-categories L1: Meetings with seniors M1: Trainings N1: Administrative O1: Telephonic communication O2: Non-telephonic communication O3: Lunch O4: Any other P1: Related to health department P2: Related to other departments P3: External agency related Q1: For patients Q2: For staff Q3: For others R1: Other Abha card/Ayushman card generation]

Figure 1“MPHW - Reported time spent on various field activities distributed as per day of the week”:

The graph represents a time and motion study related to the work patterns of multipurpose health workers (MPHWs) of Valsad taluka. Each line on the graph corresponds to a different day of the week (Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday).
Notably, there is a significant spike in reported time spent on field activities on Monday which is B6: Seasonal diseases/epidemics outbreak followed by I2: Service delivery on immunization which is peak on Wednesday as Wednesday is observed as Mamta divas followed by A3: Within field Facility to field activity followed by B4:Communicable diseases services followed by R1: Other Abha card/Ayushman card generation. Also, there is a notable near-to-nil spike in school health, adolescent services, and health camps.

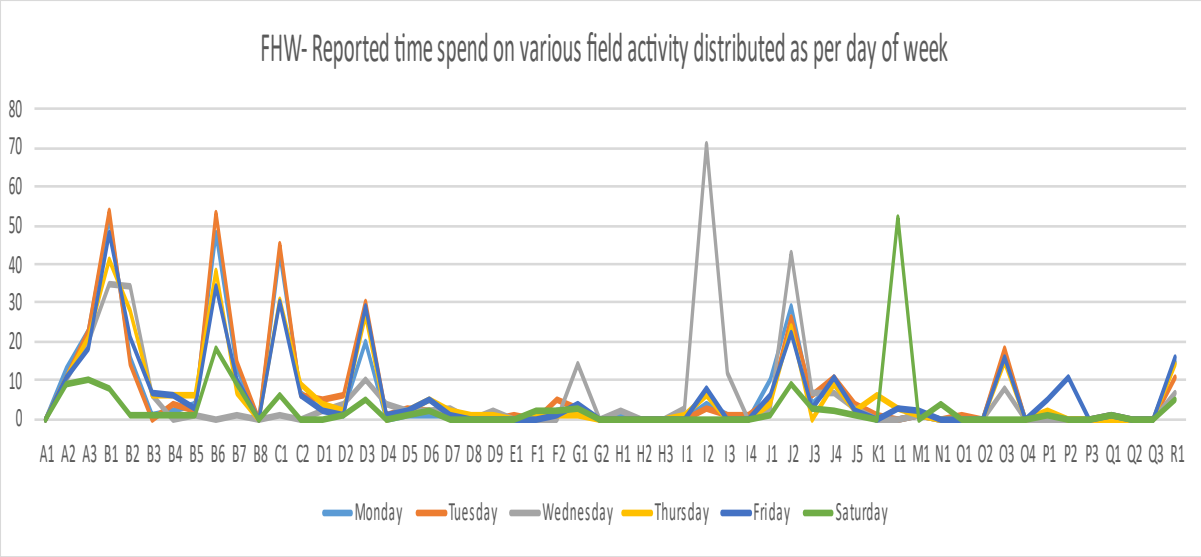

Figure 2 “FHW - Reported time spent on various field activities distributed as per day of the week”:

The graph represents a time and motion study related to the work patterns of multipurpose health workers (FHWs) of Valsad Taluka. Each line on the graph corresponds to a different day of the week (Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday).
Notably, there is a significant spike in reported time spent on I2: Service delivery on immunization which is peak on Wednesday as Wednesday is observed as Mamta divas followed by L1: Meetings with seniors field activities on Monday which is B6: Seasonal diseases/epidemics outbreak followed by followed by A3: Within field Facility to field activity followed by B4: Communicable diseases services followed by R1: Other Abha card/Ayushman card generation. Also, there is a notable near-to-nil spike in school health, adolescent services, and health camps.
Table 3 is a comparison of female health workers and male multipurpose health workers' time utilization patterns in the whole 1 week, which shows that in total 1-week female health workers spent their maximum time on service delivery and counseling category followed by paperwork followed by IEC activity at the community level, and they have spent least time health camp followed by nutrition and health day while multipurpose health workers have spent their maximum time in 1 week on service delivery and counseling followed by IEC activities at community level followed by paperwork, and they have spent least time on health camp, nutrition, and healthday and training, followed by administration and school health.

TABLE-3

	Category	FHW in total week	MPHW in a week
1	Travel	180	137
2	Service delivery and counselling	655	387
3	Home visits	184	39
4	Information, Education and Communication (IEC) activities among groups or at a community level	198	176
5	Health camps	1	0
6	School health	14	2

7	Adolescent health	28	6
8	Nutrition and health day (NHD)	3	0
9	Universal immunisation day	111	53
10	Paperwork	268	143
11	Meetings with co-workers or village community	7	10
12	Meetings with seniors	58	18
13	Trainings	6	0
14	Administrative	4	1
15	Personal work	75	73
16	Non-health- but work-related activities	20	2
17	Waiting	3	1
18	Any other	68	61

Table-4 shows the day-wise activity distribution of female health workers (FHW) and multipurpose male health workers (MPHW): Travel time for FHW over six days totals 179 times, while MPHW totals 168 times. For service delivery and counseling, FHWs spent a total of 695 times, and MPHWs spent 688 times. In home visits, FHWs spent 142 times, whereas MPHWs spent 51 times. For Information Education and Communication (IEC) activities, FHWs spent no time, while MPHWs spent 40 times. Both FHWs and MPHWs have additional categories, such as health camps, school health, adolescent health, nutrition and health day, and administrative tasks. In summary, FHWs spent more time on service delivery and counseling, while MPHWs had higher time utilization for home visits and IEC activities

TABLE-4

		FHW						MPHW					
S. No	Category	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
1	Travel	36	34	30	32	29	19	30	23	24	21	30	9
2	Service delivery and counselling	136	142	77	132	129	39	95	86	57	66	66	17
3	Home visits	50	51	1	40	36	6	9	9	4	9	7	1
4	Information, Education and Communication (IEC) activities among groups or at a community level	27	48	29	44	41	9	43	36	25	42	28	2
5	Health camps	0	1	0	0	0	0	0	0	0	0	0	0
6	School health	2	5	0	2	1	4	0	0	1	0	0	1
7	Adolescent	3	3	14	1	4	3	1	0	2	0	1	2

	health												
8	Nutrition and health day (NHD)	1	0	2	0	0	0	0	0	0	0	0	0
9	Universal immunisation day	5	5	86	7	8	0	0	0	53	0	0	0
10	Paperwork	54	52	63	39	44	16	36	27	26	19	30	5
11	Meetings with co-workers or village community	0	1	0	6	0	0	0	1	0	7	0	2
12	Meetings with seniors	0	0	0	3	3	52	4	0	0	0	1	13
13	Trainings	1	1	1	1	2	0	0	0	0	0	0	0
14	Administrative	0	0	0	0	0	4	0	0	0	0	1	0
15	Personal work	17	19	8	15	16	0	17	15	12	13	15	1
16	Non-health-but work-related activities	0	1	0	2	16	1	0	1	1	0	0	0
17	Waiting	0	1	0	0	1	1	0	0	0	0	1	0
18	Any other	15	11	7	14	16	5	12	17	7	15	10	0

Discussion:-

This study significant contribution to understanding the efficiency and effectiveness of healthcare delivery in rural settings. The focus on multipurpose healthcare workers (MPHWs) and Female Health Workers (FHWs) is particularly relevant given their critical role in the primary healthcare system in India. A time-and-motion analysis of multipurpose healthcare workers from Kashmir: ANMs (Auxiliary Nurse Midwives) spent one-fourth of their time on maintaining registers, Observations from self-reporting were comparable to those made by external observers.(11). Functioning and time utilization by female multi-purpose health workers in South India: a time and motion study: ANMs worked for a median of 7 hours a day, with variations in hours of work, patterns of service provided, and time utilization across different days of the week. They spent 60% of their on-job time on programmatic activities, with a median of 22 hours and 38 minutes per week: ANMs prioritized maternal and child health, male MPHWs deal with seasonal diseases and school health, and ASHAs provided services related to maternal health, basic curative care, and tuberculosis follow-up.(12)These studies have shown that a significant portion of healthcare workers' time is spent on maintaining records and administrative tasks, which may limit their availability for direct patient care. Additionally, the studies highlight the importance of job descriptions and work planning in managing the workload of healthcare workers effectively.

The time-and-motion analysis provides valuable insights into the daily activities and time allocation of MPHWs and FHWs. The study likely observed these healthcare workers over a period, documenting their tasks, the time spent on each task, and the challenges faced during their workday. This method of study is beneficial for identifying areas where time is not optimally utilized and suggesting improvements for better service delivery. In the Cameroon study, productive time was categorized into several key activities: performing administrative

tasks, engaging in clinical work, delivering promotion and prevention services, and maintaining general hygiene within the health center.(10). In the context of the Valsad district, which may have its unique healthcare challenges, such as a diverse population, varying geographical terrains, and different community health needs, the findings of this study could be instrumental in streamlining the workflow of healthcare workers. For instance, if the study finds that a significant portion of time is spent on paperwork tasks, it could recommend strategies to reduce this time, allowing healthcare workers to focus more on patient care.

Moreover, the study might highlight the need for additional training or resources to help healthcare workers manage their time more effectively. It could also shed light on the impact of external factors, such as transportation and infrastructure, on the efficiency of healthcare delivery.

The results of this study could serve as a benchmark for other districts in Gujarat and similar rural settings across India. By comparing the time utilization patterns of healthcare workers in different regions, policymakers and healthcare administrators can identify best practices and implement changes to enhance the overall quality of healthcare services. In conclusion, this observational study is expected to provide a comprehensive overview of the work patterns of MPHWs and FHWs in the Valsad district. The insights gained from the time-and-motion analysis could lead to actionable recommendations that improve the efficiency of healthcare workers, ultimately benefiting the community they serve. It is hoped that the findings will inform future policies and interventions aimed at strengthening the primary healthcare system in rural India. These findings reflect the workload and the nature of work of MPHWs, as well as the relevance of their job responsibilities in the context of Indian public health standards

Policymakers can leverage the insights from these time-and-motion studies to enhance healthcare delivery in several ways: optimizing workflows by identifying bottlenecks and inefficiencies in the daily tasks of healthcare workers (such as multipurpose health workers and female health workers), and streamlining administrative processes to reduce time spent on non-clinical activities (e.g., record maintenance, paperwork). Task reallocation can be achieved by redistributing tasks among different cadres of health workers, ensuring that multipurpose health workers focus on their core clinical responsibilities while administrative tasks are handled efficiently. Training and skill enhancement can be addressed by using the data to design targeted training programs for health workers, filling gaps in skills and knowledge identified through time-and-motion analysis. Resource allocation can be optimized by allocating resources (such as staffing, equipment, and infrastructure) based on workload patterns, ensuring that health centers have adequate support staff to handle administrative tasks. Performance metrics and incentives can be developed related to time utilization and task completion, tying incentives (monetary or non-monetary) to efficient use of time and quality service delivery. Technology integration can be explored through digital solutions (e.g., electronic health records, mobile apps) to streamline data entry and reporting, reducing paperwork and enhancing data accuracy. Finally, monitoring and evaluation should be regularly conducted to assess the impact of policy changes based on the insights from time-and-motion studies, allowing for adjustments in strategies as needed to improve overall healthcare efficiency.

These studies provide valuable insights for policymakers and practitioners to enhance healthcare delivery and optimize health worker workflows.

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