How Multipurpose Health Workers Spend Time During Work? Results from a Time-and-motion Study from Puducherry

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Abstract

Background: A multipurpose health worker (MPHW) is the key functionary and the first contact person in a subcenter. This study explores the workload of MPHWs in the multifarious domains of their activities and also assesses their time utilization pattern. Methods: A time and motion study was conducted among 19 auxiliary nurse midwives (ANMs) and 10 HWs male (M) from six selected primary health centers of Puducherry. Participants self-reported their daily activities on a time measurement sheet for 6 days in a week. Data were entered in EpiData software and analyzed using Excel. Calculations are based on a total of 646 and 340 person-hours of observation by ANMs and HWs (M), respectively. Results: Time utilization pattern revealed that ANMs spent half of their time on maternal and child health activities. HWs (M) utilized 45% of their time for vector control programs and 11% for other programs. Documentation constituted nearly 16% and 10% time spent by ANMs and HWs (M), respectively. Other activities that constituted multipurpose workers’ time utilization include traveling (8–10%), patient education (5–10%) and personal activities (6–12%). The proportion of time spent in community activities was around 54% by HWs (M) and 32% by ANMs. Observations on self-reporting were comparable with that of participant observations. Conclusions: This study reflects the workload in different domains of MPHWs’ activities and the “multipurpose” nature of their work, relevance of their job responsibilities in the context of national programs, and changing profile of their job.

Keywords: Auxiliary nurse midwife, multipurpose health worker, time and motion study

Introduction

Public health practices in India have been dynamic and witnessed many hurdles in their attempt to affect the lives of the people of this country.[1] A multipurpose health worker (MPHW) is the key functionary in a subcenter.[2] Auxiliary nurse midwives (ANMs) or multipurpose workers (MPWs) female and HWs male (M) provide an interface with the community at the grass-root level, providing all the primary health-care services.[3] With every new program, there is a need for collecting data from the field (baseline and monitoring purposes), thereby increasing the workload of these functionaries. There is a paucity of literature on the work performance of MPWs in the provision of basic health care and implementation of national health programs. The current role played by MPW in providing health-care services to the community is vital and needs to be analyzed.

Very few studies have been reported on HWs in community settings, possibly due to the challenging circumstances in the field and logistic difficulties in conducting such studies. 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. Our aim was to describe the patterns of time utilization of MPWs in primary care settings of Puducherry and to determine the proportions of time spent under the various domains of activities.

Methods

Study setting

Puducherry has a total population of 9,50,289, with population density of 3232 per square kilometer.[4] Primary health care is delivered in Puducherry through a network of 27 primary care centers, 47 primary health centers (PHCs), and 208 sub-health centers. The public health sector comprises of 324 public health centers (PHCs), 262 primary health centers (PHCs), and 266 sub-health centers.

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health centers (PHCs – 12 urban and 15 rural), 52 subcenters, and 2 community health centers.[5] A total of 120 male and 150 female MPHWs are currently working in Puducherry.

**Study design and population**
This was a descriptive study using time-and-motion study design. Of the 27 PHCs, six PHCs were selected randomly which includes three rural PHCs and three urban PHCs. In the selected PHCs, all eligible MPHWs who completed their service for at least 1 year in that job were included without any further sampling. A total of 19 ANMs and 10 HWs (M) were included in the study.

**Study tool**
A preliminary data sheet elicited the amount of time spent on each activity using participant observation technique, based on job functions assigned under the Indian Public Health Standard guidelines. These were categorized into domains such as outpatient care, health programs, clinic activity, documentation, patient education, travel, personal, and others. A structured time measurement sheet was developed to record activities performed and services provided (both in the field and health center), time spent in various activities per day, and the number of beneficiaries catered. In addition, age, training, work experience, and service provision details were collected from the participants. A pilot study was conducted among six ANMs and HWs (M) in Kosapalayam and Odiansalai PHCs and modified accordingly. These results were excluded from the main analysis.

**Study procedure**
Approval was obtained from the institute’s Scientific and Ethics committee and administrative approval was obtained from the Directorate of Public Health, Puducherry. All medical officers of the selected PHCs were also informed about the study. Eligible study participants were contacted and written informed consent was obtained; instructions on maintaining the time measurement sheet were given.

Data collection period at each center was 1 week. The main activities performed each day, along with the number of beneficiaries contacted and time taken for carrying out these activities, were recorded by the participants on the time measurement sheet. *A priori* participants were provided with the study tool and orientation was given. This log of activities regarding each type of work was recorded both in the field and in the health center for 6 days in a week. At the end of 6 days, the staffs were contacted and the data sheets were collected.

In addition to using participant observation technique, three ANMs and three HWs (M) were followed for 1 week by the investigator and the time measurement sheets were filled. The selected facility was visited between working hours (8 AM to 2 PM) over a period of 1 week. The investigator accompanied the HW in his/her day-to-day activities (both in the health center and in the field). The investigator used a recording sheet and a stop watch to record each activity and the time spent on it. Based on the activities performed, the time taken, and the number of beneficiaries contacted, the average time spent (in minutes) for each activity was computed. Comparisons were made for the activity profile based on self-reports by the HWs and the participant observation done by the investigator.

**Statistical analysis**
Data were entered using Epi-Data software (EpiData Association, Odense, Denmark, 2010) and analyzed using Microsoft Excel. The number of working hours in a typical week is 34 h (6 h from Monday to Friday and 4 h on Saturday). Calculations are based on a total of 646 person-hours of observation for ANMs (19 ANMs observed over 4 weeks) and 340 person-hours of observation for HWs (M) (10 HWs (M) observed over 4 weeks). Quantitative data such as number of beneficiaries and time in minutes are expressed as mean ± standard deviation. For each activity, time spent in both the health center and community/field area was included. Time spent in various activities and programs was expressed as percentage of the total working time.

**Results**
A total of 19 ANMs and 10 HWs (M) participated in this study from six PHCs (population coverage ranging from 9978 to 53,451). On an average, ANM-to-population ratio is around 1:7100, while the HW (M)-to-population ratio is around 1:12,588. Around 21% of ANMs and 93% of HWs (M) cater to more than 10,000 population. The mean age of the participants was 35, with a range of 26–54 years. Almost 50% of the participants were in the age group of 30–39 years. All participants had completed their professional training by diploma courses. Mean years of work experience were 18.5 years (3–31 years). Half of the participants had <10 years of work experience.

Table 1 shows the time utilization pattern among the MPWs. Nearly one-third of time is spent by ANMs on activities related to maternal and child health (MCH) (33.3%) followed by documentation and report writing which constituted nearly 16%. Nearly 45% of the time of the HWs (M) is utilized for National Vector Borne Disease Control Program (NVBDCP) activities followed by activities pertaining to other health programs (11%); 10% was spent on documentation. Training constituted around 15% and 9% of time spent among ANMs and HWs (M), respectively. Time spent on personal activities (such as having breakfast, snacks, changing uniforms, conversation, and idle time) was around 6% among ANMs compared to 2% by HWs (M).

ANMs spent nearly one-third of time in community-based activities (69 h, 32%) such as house visits for antenatal and postnatal care and distribution of oral pills and condoms, while two-third (146 h, 68%) were center-based activities (conducting antenatal clinic, well-baby clinic, adolescent clinic, family welfare clinic, and Janani Suraksha Yojana registration). Unit time spent per beneficiary was around 25 min in each clinic, while antenatal and postnatal visits in the field lasted for around 10 min. Compiling and updating registers was a
Nearly 63% of time of ANMs is spent on MCH and related documentation (3.5%). While underreporting was observed in personal activities (2.5 h, 2%). Overreporting by HWs (M) was observed mainly in personal activities (4.5%) and other health program activities (49.5%). Most of the registers maintained by the ANMs are related to MCH and family welfare, and hence this has been accounted under MCH activity. This is lower when compared to other studies where majority of the female workers’ role is on maternal health (65%–78%).[6] However, a recent study reported that 53% of HW (F) time was spent on MCH activities.[7] In this study, unit time spent per MCH beneficiary was around 24–26 min in each clinic and 10 min during the house visits. This is higher in comparison with another study which showed that average time spent per MPW was 3.3 min in the field.[6] Nearly 63% of time of ANMs is spent in clinic-based activities which is higher when compared to another study and this may be due to their work profile that involves conducting weekly clinics for MCH and also cater to minor ailments in outpatient departments.[8]

In our study, documentation constituted nearly 16% of time spent by ANMs and 10% among HWs (M). ANMs maintain nearly 18 registers and HWs (M) maintain 14 registers. Efforts to reduce time spent in documentation through information technology can be piloted. Reducing data documentation and duplication of reporting may provide additional time for the MPWs, thereby allocating more time for the existing and additional services. Supporting cadres such as data entry operators can assist and follow through beneficiary registration for various MCH and other tasks, thereby creating more time for ANMs.

Family welfare services are not carried out by the HWs (M) in our study; the workers perceived that lack of training and poor availability of services were the main reasons. This was also observed by Kapoor et al. that family welfare and other communicable disease control programs are not getting priority for both male and female MPHWs.[6] Job descriptions of HWs need to be revised so that they can meet the emerging needs of the population and contribute to achieving the population health in the community. Regular sensitization and training programs can be conducted for HWs (M) on family welfare, noncommunicable diseases (NCD) screening and prevention, etc. and ANMs (other health programs and services) in order to increase the scope of their time utilization. Task shifting and restructuring of job responsibilities of MPWs may be another option for provision of new services such as NCD and geriatric care, both in clinics and community.

Time spent on personal activities (such as having food and tea and changing uniforms) was 6% in ANMs compared to 12% among daily activity and took up almost 72 h, while monthly report writing consumed 33 h.

Time spent by the HWs (M) on NVBDCP include both community-based – 54% (active surveillance, house visits, source detection, follow-up, checking domestic breeding, etc.) and center-based activities (passive surveillance and tasks such as indenting and dispatching). Water sanitation activities and issue of weekly iron folic acid supplements constitute other health program activities. Documentation and record maintenance took up almost 32 h of work.

Comparison of self-reported versus participant observed work profile was done to verify the validity of the self-reported time utilization by the participants [Table 2]. Overreporting by the ANMs was observed in MCH activities (4%) and documentation (3.5%), while underreporting was observed mainly in personal activities (4.5%) and other services (2.5 h, 2%). Overreporting by HWs (M) was observed in documentation (3%) and activities of other health programs (2%), while underreporting was observed in personal activities (5%) and in NVBDCP (1.5%).

**Discussion**

Time utilization pattern reveals that nearly half of the time of the ANM is spent on MCH and related documentation activities (49.5%). Most of the registers maintained by the ANMs are related to MCH and family welfare, and hence this has been accounted under MCH activity. This is lower when compared to other studies where majority of the female workers’ role is on maternal health (65%–78%).[6] However, a recent study reported that 53% of HW (F) time was spent on MCH activities.[7] In this study, unit time spent per MCH beneficiary was around 24–26 min in each clinic and 10 min during the house visits. This is higher in comparison with another study which showed that average time spent per MPW was 3.3 min in the field.[6] Nearly 63% of time of ANMs is spent in clinic-based activities which is higher when compared to another study and this may be due to their work profile that involves conducting weekly clinics for MCH and also cater to minor ailments in outpatient departments.[8]
Table 2: Comparison of work profile of three auxiliary nurse midwives and three health workers male in various domains by participant observation study and self-reported measures

| Domains of activity | Time spent as in participant observation | Self-reported time spent by participants | Difference (h) |
|---------------------|------------------------------------------|------------------------------------------|----------------|
|                     | n (h) | Percentage | n (h) | Percentage |                      |
| ANMs                |       |            |       |            |                      |
| MCH activities      | 29.5  | 32.8       | 33    | 36.7       | 3.5                 |
| Travel              | 14.5  | 16.1       | 14    | 15.6       | −0.5                |
| Personal            | 13    | 14.4       | 9     | 10.0       | −4                  |
| Documentation       | 11    | 12.2       | 14    | 15.6       | 3                   |
| Patient education   | 10.5  | 11.7       | 14    | 12.2       | 0.5                 |
| Other services      | 13.5  | 15.0       | 11    | 12.2       | −2.5                |
| Total               | 90    | 100        | 90    | 100        |                      |
| HWs (M)             |       |            |       |            |                      |
| NVBDCP              | 37.5  | 36.8       | 36    | 35.3       | −1.5                |
| Other health programs | 20    | 19.6       | 22    | 21.6       | 2                   |
| Personal            | 12.5  | 12.3       | 7.5   | 7.4        | −5                  |
| Patient education   | 8.5   | 8.3        | 10    | 9.8        | 1.5                 |
| Training            | 8     | 7.8        | 8     | 7.8        | 0                   |
| Documentation       | 8     | 7.8        | 11    | 10.8       | 3                   |
| Travel              | 7.5   | 7.4        | 7.5   | 7.4        | 0                   |
| Total               | 102   | 100        | 102   | 100        |                      |

MCH: Maternal and child health, ANMs: Auxiliary Nurse Midwives, HWs (M): Health Workers Male, NVBDCP: National Vector Borne Disease Control Program

HWs (M). This had been found to be low in our study compared to other studies maybe due to underreporting of personal activities. However, a study done in Ahmedabad, Gujarat, among three MPHWs showed that majority of the time was spent for sitting idle and lunch break, and the main works such as field activity and immunization were given much less time.[9]

Self-reporting though a low-cost means of quantifying the allocation of time has its own merits and demerits. However, in our study, we noted that most of the observations on self-reporting were comparable with that of participant observation and discrepancy was around 6%–8%. Overreporting in documentation and underreporting in personal activities were observed among both ANMs and HWs (M). This is similar to a study where HWs overreport their performance in comparison with information obtained on field surveys.[7] Another study reported that though comparable amounts of total time were reported within the various activity categories, mean activity times were significantly longer using the self-reporting method compared with time-and-motion method.[10] Hawthorne effect or observer bias may be due to the awareness of being observed followed by behavioral change in line with the researcher’s expectations leading to conformity and social desirability.[11]

This is one of the few studies that capture time utilization among MPWs in India which documents the real-life work performance, especially in the post-National Rural Health Mission context. However, there are a few limitations to this study. Self-reporting may have led to overreporting of activities performed and time taken per activity. Hence, participant observation method was utilized in a subset, to assess bias due to self-reporting and these findings correlated with participant observation in this study.

In addition, presence of the researcher might have influenced the behavior of the respondents, who may change the routine in order to represent desirable work performance. However, these are inherent limitations of time-and-motion studies and the data collected need to be interpreted in the context. There may be some misclassification in categorization of activities in this study (e.g., MCH services and documentation related to MCH).

Time taken in providing the various health services may differ between two HWs depending on their competence, experience, and situation. Activities at health center level that vary during certain periods of the year (special campaigns) are likely to be missed in such observation-based methods of short duration.

Sample size was not calculated based on scientific methods for time-and-motion studies. Further studies need to be done to capture the perceptions of the medical officers and program managers regarding work and time utilization pattern of MPWs.

Conclusions

This study reflects the workload in the different domains of the activities of MPHWs and also helps us to understand the “multipurpose” nature of their work, relevance of their current job responsibilities in the context of the national health programs, and changing profile of their job.

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Conflicts of interest

There are no conflicts of interest.

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