ABSTRACT

Objective: To determine time standards for interventions and activities conducted by nursing professionals in Family Health Units (FHU) in Brazil to substantiate the calculation of work force. Method: This was an observational study carried out in 27 FHU, in 12 municipalities in 10 states, in 2013. In each unit, nursing professionals were observed every 10 minutes, for eight work hours, on five consecutive days via the work sampling technique. Results: A total of 32,613 observations were made, involving 47 nurses and 93 nursing technicians/assistants. Appointments were the main intervention carried out by nurses, with a mean time of 25.3 minutes, followed by record-keeping, which corresponded to 9.7%. On average, nursing technicians/assistants spent 6.3% of their time keeping records and 30.6 intervention minutes on immunization/vaccination control. Conclusion: The study resulted in standard times of interventions carried out by the FHU nursing team, which can underpin the determination of nursing staff size and human resource policies. Furthermore, the study showed the panorama of interventions currently employed, allowing for the work process to be reviewed and optimized.

DESCRIPTORS
Primary Health Care; Community Health Nursing; Public Health Nursing; Health Manpower; Workload.
INTRODUCTION

There are few studies on how nursing professionals spend their working time in primary health care units. On the other hand, there is a notorious need for information to underpin managerial decision making, both in terms of workforce planning and when analyzing and implementing changes in nursing practices, in accordance with advances proposed for healthcare models.

In Brazil, primary health care (PHC) has grown via the Family Health Strategy (FHS). Between 1981 and 2008, the search for primary care services by Brazilians increased approximately 450% (7). In 2011, 95% of Brazilian municipalities and 53% of the Brazilian population were covered by the FHS (8).

In the FHS, teams are multiprofessional and composed at least by a general practitioner or physician specialized in family health or a family and community physician, a general nurse or nurse specialized in family health, a nursing technician or assistant, and four community health agents. Dental professionals are sometimes part of this multiprofessional team, and include general or amily health surgeons-dentists and a dental assistant and/or technician. These professionals hold 40-hour working weeks at the FHS, with the exception of medical professionals, whose workload can be re-distributed among other municipal health services (9). This team is responsible for 4,000 people at the most, being that the recommended average is 3,000. This number is calculated by respecting equity criteria and has recently changed to 2,000 people per team (9).

Several studies have described positive evidence of the implementation of the FHS (9, 10). However, they emphasize that one of the greatest obstacles to its effective consolidation lies in the quantitative and qualitative lack of professionals prepared to deal with the new attributions required by this care model (10).

Furthermore, the parameters recommended nationwide regarding the FHS staff size do not always meet local epidemiological characteristics and the demands of the health surveillance model (10). Therefore, predicting the necessary number of professionals to meet the demands of a family health unit (FHU) is not an easy task.

Workforce planning in health is a broad and complex issue, which involves not only a technical process, but also a political and ethical one. The latter depends on values that reflect the political, economic and social choices that are at the basis of a healthcare system. Such planning requires seeking balance between available workforce and that necessary to carry out health services. Estimating the number of professionals and the skills needed in order to reach health policies and goals requires a systematic process, which requires monitoring, ongoing assessment, and evidence to underpin the process, with reliable and accessible data on the work conducted by professionals.

The mean time of care to meet the needs of users, families and the community is the central variable in health staffing methods. However, many measures of time are based only on the professional judgment or experience. There is a lack of studies that use objective and empirical time measures of interventions/activities carried out by the FHS.

Current methods such as the Workload Indicators of Staffing Need (WISN) (9), proposed by the World Health Organization (WHO), have been employed in health organizations in several countries, advancing the proposal of workforce planning for all team members, which indicates great promise for its applicability in the FHS. Its main variable is based on time standards, i.e., the time needed for a trained, qualified and motivated professional to conduct an intervention or activity according to satisfactory professional standards under the conditions and circumstances of each location (9).

Before this scenario, the aim of the present study was to determine time standards of interventions/activities carried out by nursing professionals in FHU in Brazil in order to substantiate workforce calculation.

METHOD

This was an observational study conducted via the work sampling technique. It is recommended that in research on time of work of health professionals, data be collected from services that follow good practices. Thus, for this study, we chose an intentional sample, based on the following criteria: geographic location, the presence of a complete family health and dental health team, having received a great assessment in the first cycle of the Primary Care Access and Quality Improvement Program (PMAQ-AB).

In order to ensure greater comparability of performance among teams, the PMAQ considered the diversity of socioeconomic, epidemiological and demographic scenario, in addition to differences between participating municipalities and specificities of the responses demanded from local health systems, classifying each municipality into different strata considering social, economic and demographic aspects. To this end, an index from zero to ten was created, composed of five indicators: gross domestic product (GDP) per capita (weight 2), percentage of the population with health insurance (weight 2), percentage of the population who benefit from the government’s Family Grant (Bolsa Família) program (weight 1), percentage of the population living in extreme poverty (weight 1) and demographic density (weight 1) (9).

Demographic socioeconomic strata were defined as follows: Stratum 1 (score lower than 4.82 and population up to 10,000); Stratum 2 (score lower than 4.82 and population up to 20,000); Stratum 3 (score lower than 4.82 and population up to 50,000); Stratum 4 (score between 4.82 and 5.4 and population up to 100,000 and municipalities with a score lower than 4.82 and a population between 50,000 and 10,000); Stratum 5 (score between 5.4 and 5.85 and population up to 500,000; and municipalities with scores lower than 5.4 and population between 100,000 and 500,000); and Stratum 6 (population over 500,000 or score equal or greater than 5.85) (9).

According to these guidelines, data were collected from five Brazilian geographical regions, 10 states, 12 municipalities and 27 FHU. Participants consisted of FHU nurses and
nursing technicians/assistants who were present at the time of data collection and agreed to participate in the survey. Nurses who worked exclusively in management positions were excluded from the sample.

Prior to data collection, a field visit was conducted with the goal of planning data collection logistics, presenting the study to FHU professionals and clarifying that at no point was the quality of service provision being assessed, as that had already been done by PMAQ and the unit in focus had been considered of excellence. During the entire data collection process, this premise was reinforced, thus minimizing the reactivity of professionals to the direct observation of their work.

The minimum ratio of field researchers, considering the minimum team proposed for FHU, consisted of one supervisor and one observer for every six professionals. Priority was given to arrangements in which the observer accompanied the same professional category and the same professionals throughout the entire data collection period.

The observers did not establish prior contact with FHU professionals. Observations were non-participant and professionals were only asked questions about activities when something was not clear to the observers.

Data were collected through structured, non-participant observation and the interventions and activities were recorded every ten minutes, throughout the entire work shift at the unit (8 hours per day), for a full workweek (5 days) between March and October 2013.

The instrument used to gather data was developed and validated for a FHS team (physician, nurse, surgeon-dentist, nursing technician/assistant, dental technician/assistant, and community health agent). Data were collected on the time of 39 health interventions, unit related activities, standby time and absences. This instrument was encoded and computerized, which allowed us to record the observations on tablets.

The observers consisted of nurses who underwent 20 hours of theoretical and practical training. Interobserver reliability was conducted during data collection.

For interventions conducted outside the FHU, such as home visits or community groups, the observers did not accompany the professional, only recording the amount of time spent at the intervention. To ensure better control, the professionals were asked to inform their observers about when they were leaving and when they returned. Conversations among professionals inside the offices were presumed to be of professional nature.

Researchers were provided with the following mandatory material: a lab coat with “researcher” written on it, a badge and a tablet. Observers had the right to a one-hour lunch break and other breaks for personal needs, being covered by the field supervisor as the facilitator, ensuring a good data collection process and carrying out the reliability test.

This study was approved by the São Paulo School of Nursing research ethics committee (no. 170278) and the municipal secretariats of health. All procedures abided by the guidelines set forth in National Health Council Resolution no. 466, of December 2012.

The data were statistically analyzed by strata, grouped from 1 to 4, 5 and 6, considering the total number of FHUs sampled in Brazil. This was done to ensure greater equity to the comparison between FHUs, in addition to providing time parameters that could be applied to different realities.

The following adjustments were made to calculate the mean time of interventions/activities:

Standby time was distributed proportionally among interventions that involve waiting for late and absent users, or when professionals are scheduled for that type of care, as commonly occurs in the immunization room. Interventions that received this additional time were: assisting in tests/procedures, attending to spontaneous demands, consultations, immunization/vaccination control, outpatient procedures and home visits.

Personal time was distributed among all of the care interventions and activities and associated activities, as the literature has shown the importance of such time in issues regarding workers’ health and job satisfaction.

The times for each intervention/activity according to professional category were obtained by the following equations:

Equation 1:

$$TO = NO \times 10 \text{ min}$$

Where:

- $TO$ = Time of Observation for each intervention/activity;
- $NO$ = Number of observed samples.

*10 minutes refers to the interval of time used in the work sampling technique.

Equation 2:

$$TP = \frac{TO_i + TER_i + TPR_i}{NO_i}$$

Where:

- $TP$ = Mean time of intervention $i$;
- $TO_i$ = Total time of observation for intervention $i$;
- $TER_i$ = Standby time apportioned to intervention $i$;
- $TPR_i$ = Personal and apportioned time for intervention/activity $i$;
- $NO_i$ = Number of observations for $i$.

For the following interventions: educational actions for health professionals; administration of medications; providing physician with support; assisting in tests/procedures; breastfeeding assistance; attending to spontaneous demand; consultations; immunization/vaccination control; emergency care; outpatient procedures; promotion of educational actions; venous puncture; venous blood sampling; administration meetings; health surveillance; and sharing information on care provided; the variable $NO_i$ corresponded to the number of records regarding the same user or the same activity, i.e., the frequency of the intervention and not of the sample.

In order to ensure a better assessment of the mean time of home visit interventions, $NO_i$ referred to the number of visits conducted and not the number of samples observed.

The productivity of nurses and nursing technicians/assistants was analyzed considering effective working time, i.e., the sum of the percentage of working time spent by professionals on direct and indirect care activities associated with working and waiting time.
RESULTS

One hundred and forty professionals (nurses and nursing technicians/assistants) were observed throughout the Brazilian territory, producing a total of 32,613 observations. Of these: 10,669 (33%) were in municipalities from strata 1 to 4; 4,415 (13%) from stratum 5, and 17,529 (54%) in stratum 6. In 15% of the total number of observations, we conducted reliability tests, which resulted in 79% of interobserver agreement.

Most of the nurses who participated in the study were women (91%) between the ages of 30 and 39 (47%), with graduate-level specialization degrees (92%) in public/collective health (38%), followed by family and community medicine (13%). In terms of professional experience, 32% had between 10 and 15 years, 34% had 5 to 10 years with PHC and 47% had worked at the FHU for 1 to 5 years.

Regarding nursing technician/assistant participants, most were women (91%), between 30 and 49 years old, with complete elementary, secondary or technical education (84%). Furthermore, most presented 5 to 10 years of professional experience (26%), and experience with PHC and FHU, respectively, of 1 to 5 years (33% and 42%).

Of the 27 observed FHU, 48% (13) belonged to strata 1 to 4; 11% (3) to stratum 5 and 41% (11) to stratum 6, with urban coverage (81%), but also mixed (7%) and rural (11%). There was a predominance of one team per unit (52%), with the greatest variety of number of teams present in stratum 6. Most FHU were teaching units (93%).

After excluding the percentage of observations conducted simultaneously for reliability testing, we analyzed 27,846 of distributed observations, as shown in Table 1.

Tables 2 and 3 present the frequency and mean time of observed interventions.

Table 1 – Distribution of interventions/activities conducted by nurses and nursing technicians/assistants, by demographic socioeconomic strata, between March and October 2013 – Brazil, 2015.

<table>
<thead>
<tr>
<th>Stratum 1 to 4</th>
<th>Stratum 5</th>
<th>Stratum 6</th>
<th>Brazil</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Interventions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1950</td>
<td>60</td>
<td>2559</td>
<td>47</td>
</tr>
<tr>
<td>Direct care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>961</td>
<td>49</td>
<td>1588</td>
<td>62</td>
</tr>
<tr>
<td>Indirect care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>989</td>
<td>51</td>
<td>971</td>
<td>38</td>
</tr>
<tr>
<td>Unit-related Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>358</td>
<td>11</td>
<td>654</td>
<td>12</td>
</tr>
<tr>
<td>Personal Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>367</td>
<td>11</td>
<td>873</td>
<td>16</td>
</tr>
<tr>
<td>Standby time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>3</td>
<td>617</td>
<td>11</td>
</tr>
<tr>
<td>Absences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>403</td>
<td>12</td>
<td>665</td>
<td>12</td>
</tr>
<tr>
<td>No observation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>3</td>
<td>104</td>
<td>2</td>
</tr>
<tr>
<td>Effective working time</td>
<td>2412</td>
<td>74</td>
<td>3830</td>
</tr>
<tr>
<td>Total</td>
<td>3264</td>
<td>100</td>
<td>5472</td>
</tr>
</tbody>
</table>

*Tec./Assist.: Nursing technician/assistant. ** Direct care: care provided directly to users, families and communities; Indirect care: care provided away from users, families and communities, but in their benefit; Unit-related activities: those that can be executed by other professional categories, but are assigned to health professionals; Standby time: when professionals are available for care provision, waiting for users and/or professionals who are not present at the time of observation, either due to absence and/or tardiness of users and/or professionals, lack of demand, or the other professional is busy with another activity; and Absences: when the professional leaves the unit to perform activities unrelated to the FHU.

Table 2 – Mean time in minutes and probability of occurrence (%) of interventions conducted by FHU nurses – Brazil, 2015.

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Strata 1 to 4</th>
<th>Stratum 5</th>
<th>Stratum 6</th>
<th>Brazil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time (min)</td>
<td>Freq. (%)</td>
<td>Time (min)</td>
<td>Freq. (%)</td>
</tr>
<tr>
<td>Educational actions for health professionals</td>
<td>24.0</td>
<td>0.6</td>
<td>174.0</td>
<td>6.3</td>
</tr>
<tr>
<td>Administering medication</td>
<td>12.0</td>
<td>0.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Supporting students</td>
<td>11.0</td>
<td>0.4</td>
<td>13.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Assisting in tests/procedures</td>
<td>14.0</td>
<td>0.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Attending to spontaneous demands</td>
<td>30.8</td>
<td>8.5</td>
<td>32.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Appointment</td>
<td>32.4</td>
<td>7.1</td>
<td>36.7</td>
<td>13.4</td>
</tr>
<tr>
<td>Community Disease Management</td>
<td>11.0</td>
<td>0.0</td>
<td>12.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Immunization/vaccination control</td>
<td>24.0</td>
<td>1.3</td>
<td>27.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Infection control</td>
<td>12.0</td>
<td>0.0</td>
<td>11.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Supply control</td>
<td>11.0</td>
<td>0.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Organizing work processes</td>
<td>11.0</td>
<td>2.9</td>
<td>11.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Developing administrative processes/routines</td>
<td>13.0</td>
<td>0.8</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

continued...
Table 3 – Mean time in minutes and probability of occurrence (%) of interventions conducted by FHU nursing technicians/assistants – Brazil, 2015.
DISCUSSION

This type of study is new in Brazil, and its importance lies in the diversity and national extent of the studied realities, both in quantity of observations and the identification of frequencies of interventions/activities carried out by nursing professionals. This allows for a more realistic and objective calculation of mean time of interventions and consequently, workload at the FHU.

The results show that nurses spend more time during their work shifts on direct and indirect care interventions and absent periods than nursing technicians/assistants. However, the technical staff spent more time on associated activities, personal activities and waiting time.

In contrast with nurses, nursing technicians/assistants presented greater diversity and amplitude in the number of low-frequency activities. In turn, nurses conducted fewer interventions at higher frequencies.

Interventions such as consultations, attending to spontaneous demands, and home visits were among the most frequent activities and compose the characteristic triad of the care provision dimension. They represent a significant portion of the workload of FHU nurses. Furthermore, these practices have the potential to broaden the access of users to the service, humanizing care and functioning as a device to reorganize the work process.

Direct care provided by nurses in FHU from strata 1 to 4 were more focused on attending to spontaneous demands and making home visits and lesser so on appointments when compared to FHU in strata 6. For the most part, smaller municipalities are more receptive to spontaneous demands, but have not yet incorporated nursing appointments to the routine of FHU nursing practices.

In contrast, among FHU from strata 6, appointments and attending to spontaneous demands stood out as the most common interventions, with a higher percentage of occurrence when compared to other strata. On the other hand, interventions such as home visits and promoting educational actions presented lower percentages, from which we can infer that more developed and/or higher population municipalities allocate most of the nurses' direct interventions on clinical care and less on external and educational activities.

The nursing technician/assistant category is rarely described in the literature. We observed that a quarter of their working time was spent on direct care and, even though there were no studies available for comparison, we believe that much of what is done by the nursing staff is invisible (13-14).

Sharing information on care provided was among the most frequent indirect care interventions, which we believe indicates a positive and important result, as it strengthens communication, work relationships between team professionals, and collaborative practices. This intervention was more frequent in strata that presented a higher percentage of time spent on spontaneous demands.

Regarding educational actions for health professionals, nurses dedicated a higher percentage of time on this intervention when compared to technicians/assistants. However, units from strata 1 to 4 represented only 0.6% for both categories. Evaluators who participated in the PMAQ observed the insufficiency of professional training programs or ongoing health education actions that support the good development of teams (19).

Several studies have indicated the need for ongoing education aimed at nursing professionals, recommending greater investment. In particular, nursing assistants complain of the scarcity of courses, which are offered only sporadically. Furthermore, when they are offered, such programs address themes that do not correspond to the real needs of their routine work processes and are considered a hindrance to the quality development of their activities (13-14,20).

The small participation of nursing technicians/ aids in multidisciplinary care assessment meetings portrays the absence of these professionals when planning and discussing care, reinforcing their institutionalized technical role. The role of these professionals within the family health team must be reconsidered.

The mobilization of adequate nursing care resources is a concern for nursing managers worldwide. Thus, variables such as mean time of nursing activities are essential, given that the authors consider that understanding the workload of nurses is crucial to the staff planning (21).

The use of mean times and/or socioeconomic and demographic strata in Brazil in order to determine nursing staff size enables projections that are in accordance with the population of coverage areas and consequently, closer to the reality of municipalities and the proposal of the FHS.

It is also worth emphasizing the importance of nurses in the management, organization and coordination of the work process and clinical care.

Indirect care interventions compose a significant part of the workload. The results showed that nurses spend up to five times more time than nursing technicians/assistants in administration meetings and organizing work processes, even when they do not work exclusively with unit management.

The results showed that documentation was one of the most frequent interventions conducted by nurses and nursing technicians/assistants. However, the values presented by studies conducted in other contexts, such as surgical centers, nursing homes, and community centers in the U.S. showed higher percentages (15-17).

We also emphasize the importance of the indirect care provided to users, families and communities, reinforcing the idea that much of what is done by the nursing staff is invisible (18).
CONCLUSÃO

O que se tem observado é que este período de ausência observado em FHU é contra os cuidados básicos. E como consequência, isso pode ser usado para melhorar o desempenho e a eficiência. Por isso, é crucial que a discussão seja feita sobre como isso pode ser melhorado.

O estudo apresenta possibilidades para debate e reflexão sobre o trabalho e o desempenho dos enfermeiros em FHU. Este estudo tem algumas limitações. O tempo de trabalho na realização de intervenções/pelos enfermeiros foi a consulta, com tempo médio de 25,3 minutos, seguida de documentação, que correspondeu a 9,7%. Os técnicos/auxiliares de enfermagem, que representa 7% dos trabalhadores de saúde em FHU, e a dupla de que os técnicos/auxiliares de enfermagem podem dedicar seu tempo de trabalho a usuários, famílias e comunidades, e os tempos podem ser contados para que haja uma assistência administrativa para essas funções.

O tempo de espera é uma atividade que é pouco encontrada na literatura, e é também mais característica em ambientes não-hospitalares, como pacientes ou serviços de cuidados primários. A maioria dos enfermeiros e profissionais de saúde primários é restrita a tempos fixos e tempos de espera ou em serviços dinâmicos, atraentes e acessíveis. Estas atividades são necessárias para que a comunidade possa evoluir.

Nós também encontramos dados sobre o trabalho que é considerado tempo efetivo. O tempo que os profissionais passam trabalhando pode ser usado para entender o significado do tempo efetivo. Ademais, é mais característico entre os trabalhadores que não trabalhavam em hospitais. Portanto, é crucial que a discussão sobre como isso pode ser melhorado.

O estudo é uma base para futuros estudos sobre o trabalho e o desempenho de enfermeiros em FHU. Isso pode ser usado para melhorar o desempenho e a eficiência.
vacación. **Conclusión:** El estudio ofrece patrones de tiempo de las intervenciones realizadas por el equipo de enfermería en USF, subsidiando a la aplicación de métodos de dimensionamiento de profesionales de enfermería y políticas públicas de recursos humanos. Además, presenta un panorama de las intervenciones desarrolladas, posibilitando una revisión y optimización del proceso de trabajo.

**RESUMEN**

**Objetivo:** Determinar estándares de tiempo de las intervenciones/actividades por los profesionales de enfermería en Unidades de Salud de la Familia (USF) en Brasil, para subsidiar el cálculo de la fuerza de trabajo. **Método:** Estudio observacional, llevado a cabo en 27 USF, 10 estados, 12 municipios, el año de 2013. En cada Unidad los profesionales de enfermería fueron observados cada diez minutos, durante ocho horas de trabajo, en cinco días consecutivos, por medio de la técnica de muestreo del trabajo. **Resultados:** Fueron observados 47 enfermeros y 93 técnicos/auxiliares de enfermería, lográndose el total de 32.613 observaciones. La principal intervención observada fue la consulta, con tiempo medio de 25,3 minutos, seguida de documentación y 30,6 minutos en la intervención control de inmunización/vacunación. **Conclusión:** El estudio suministra estándares de tiempos de las intervenciones realizadas por el equipo de enfermería en USF, subsidiando la aplicación de métodos de dimensionamiento de profesionales de enfermería y políticas de recursos humanos. Además, presenta el panorama de las actuales intervenciones desarrolladas, posibilitando una revisión y optimización del proceso de trabajo.

**REFERENCIAS**


