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Research Article

How Do Nurses Spend Their Time in The Hospital?

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Abstract

Purpose: The current study investigated the productivity of nurses in emergency department, ICU and CCU of Shahid-Madani hospital in Tabriz.

Methods: A two-stage time and motion study was conducted; the observational work sampling study was undertaken by 15 nurses, followed by self-reporting work sampling study by 42 nurses over a period of five weeks. Descriptive and analytical statistics were used to analyze the data.

Results: Fifty-seven work sampling data were collected, 15 through the observational study and 42 in self-reporting. Considerable differences were found in the nurses' time distribution between two techniques. Percentage of direct, indirect and personal activities in observational versus self-reporting were observed (32.74% versus 40.52%), (24.09% versus 28.84%) and (42.30% versus 30.41%) respectively.

Conclusion: A considerable proportion of nurses' time in each shift was spent on their personal activities, which would affect their productivity as well as their direct and indirect delivered cares for patients. Identifying the percentage of spent time on nurses' personal activities would be a useful measure for improving patient care protocols in the hospitals.

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Introduction

In the current health care delivery system, the hospitals are the enduring symbol of medical care and health organizations [1]. In recent years, the importance of staff management to attain optimum quality of care as main performance of hospitals has been generally overlooked. Despite the existing evidence which indicates the impact of human resource management on the improvement of organizational performance in other sectors, the limited but growing evidence shows attempts to assess the implications of human resource management in the health sectors [2].

Nursing care is known as one of the fundamental services especially in the wards which patients need to receive more service and care. On the other hands, nurses, as the frontline caregivers and the largest human resource element, have a key role in providing high-quality care for patients [3, 4] in the hospitals [5].Concerning their imperative role, maximizing the efficiency and effectiveness of nursing care is important to improve delivered care's quality as well as the integrity of the hospital function which leads to patients' care promotion [3].

Nursing care efficiency is defined as the balance between the demand for and the supply of services and the managing cost structure of a system by integration of financial and clinical processes and providing high-quality care in a cost-effective method. Nurses' efficiency affects an organization's success by influencing total factors of productivity in hospital [4]. Maximizing the efficiency of the nurses and nursing team could decrease the waiting times for patients, resulting in greater patient satisfaction and productivity [6]. Role of nursing care on patients' safety and health care outcomes have led to increased interest in measuring and reporting nursing's performance [7]. Performance measurement seeks to monitor, evaluate and communicate the extent to which various aspects of the health system meet their key objectives [8].

One of the methods of performance measuring is work study[9]. Work study is a term used to refer inclusively to all the techniques or methods of study of work measurement [10], which offers a process of using time and effort more economically [11]. Methods of work measurement include subjective evaluation, direct time study, work sampling, statistical data, and pre-determined data [12]. Work study as one of the most incisive tools of analysis for productivity enhancement, has been widely used throughout the health organizations [10]. Time studies are now being used to assess

and improve workers' efficiency in the hospital setting [13]. Nursing work studies which involve the use of the work sampling technique, have shown it to be well suited for the analysis of nursing activities and the utilization of nursing time[9]. Nurse executives are often required to provide additional patient care services with limited personnel resources.

As a result, nurse executives must evaluate the appropriate allocation of nursing personnel resources which is exactly the propose of work study [14]. Time needed to present necessary services, is the key measure of workload particularly when discussing emergency department (ED) staffing models [15]. Measurement of nursing workload is a required component of workforce planning, workload distribution, staff assessment, and resource allocation. A detailed understanding of workload supports excellent patient care, public accountability, and overall health services planning [16].

Improvement in determination of nursing activity times can only occur if the nurse has a basic understanding of work study concept and its techniques, and uses it in nursing works to eliminate waste and complexity before managing and organizing them to become more productive than the traditional one [10]. The emergency ward as well as ICU and CCU have a crowd of activity, data, and issues that enhance and reduce in importance through each shift. For this reason, technical work studies in these units would seem a particularly challenging subject [17].

Identifying the percentage of time nurses spend on personal activities allows calculating these professionals' productivity, by reducing the hours professionals are available during their work shifts, according to the proportion of time used for their personal needs or the sum of the proportion of time spent on direct and indirect care [18].

Understanding of how nurses spend their time in the hospitals and adapting it by needs of patients and hospitals would be golden opportunities for improving nursing care effectiveness [3,19]. Based on the above mentioned background, the purpose of current study was to identify how nurses spend their time during their shifts in order to increase nursing care time and therefore improve productivity of nurses specifically in ICU, CCU and emergency wards.

Methods

Design

In the current two-stage time and motion study, Work Observation Method by Activity Timing (WOMBAT) followed by self-reporting study was used. Three observers in this study were recruited, all having health services administration background. Although observers did not belong to participants' groups and did not enter to activities (complete observer method was used), short communications were made between observers and nurses when needed. In addition, when necessary, the participant nurses introduced the observer to the patients or their families and requested permission to continue.

Setting

The study was carried out at the emergency department, ICU and CCU of a medical research and training heart hospital in Tabriz, Iran. Since, these care units are complex, high-risk and vital; therefore, the nurses' works and activities in these units are highly sensitive and well worth considering.

Participants

Forty-two (25 women and 17 men) nurses who worked in the day, evening and night shifts in the emergency department, ICU and CCU wards, were recruited in this research. Fifteen of which (five in each unit) accepted to take part in the observation in addition to self-reporting. Overall rate of participation in this study was 87.5 percent (42 of 48). Thirty-six (85.7%) of participants had Bachelor of Arts degree, four (9.5%) had Master of Arts, and two (4.8%) had PhD degree. Although all nurses could enter the observational study, only enthusiast ones were included. Other staffs such as attending physicians, medical trainees, or other health care providers were excluded from the investigation. Self-reporting forms were distributed among all 48 nurses, but only 42 of them were delivered back to the researchers.

Table 1. The categories of nursing work activities

Category	Definition of activities and examples
Direct care activities	All nursing activities are performed in the presence of the patient and his/her family; for example, ECG, serum therapy, monitoring, muscular injection and etc.
Indirect care activities	All nursing activities that are done away from the patients but in behalf of them; for example, documentation, shift transfer, coordination with other wards, drug preparation and etc.
Personal activities	All activities that are done to meet personal needs of the nursing staff; for example, meal and drinks, rest and etc.

Table 2. Comparison of observational and self-reporting results regarding time distribution of direct care, indirect care, and personal activities

Activity	Method evaluation		Chi-Square χ^2	P value
	Observational (%)	Self-reporting (%)		
Direct care	32.74	40.52	7.626	0.006
Indirect care	24.09	28.84	3.690	0.055
Personal	42.30	30.41	17.128	0.000

Data collection

Data was collected over a period of 5 weeks (2009/12/26 – 2010/1/30).

Study procedure

Lists of nursing activities were identified by using previous printed articles. These activities were categorized into three groups: direct care, indirect care, and personal activities. The categorization and activities were approved by the hospital's management, nursing management, nursing staff, and head nurses of the related units and the final categorization was prepared after applying some additions (Table 1). Data collection form (used in both methods), which professionals have confirmed its validation, was engendered from the list of identified activities. Two weeks before data collection, the observers visited the wards; and introduced themselves to the nursing staff. It provided a chance for observers and nursing staff to get familiar with each other, therefore, role-playing was avoided and minimizing the "Hawthorne effect" led to an

accurate work sampling. Nursing staff were informed about the method and purpose of the study and were encouraged to carry out their duties as they normally did. In addition, they were given an information sheet about the study before asking for consent. In the observational study, the observer who had a predefined categorization of activities, followed the nurse for the full length of the shift and recorded all undertaken duties by a stopwatch, also the time of tasks completed at the same time or multi-tasking were separately recorded. Time of activities in self-reporting study was recorded without using chronometer. Nurses registered the time of all of their activities by their watches.

Data analysis

Raw data were transferred to the Excel spreadsheet and were analyzed using SPSS 16.0. Descriptive statistics were used to calculate the average percentage of time spent on each activity. To perform comparison of differences among shifts, and comparison of two data collection methods, we used analytical statistics. Also, χ^2 analyses were conducted to assess the researcher's hypothesis that there were no significant differences in the time distribution of activities between the two work sampling methods.

Ethical considerations

Based on the contest given by the nurses, ethical approval was granted by the ethics committee of Tabriz University of Medical Sciences. Furthermore, the study showed no risk to patients, and the data collection process did not fluctuate the duration of the patient's visit and care.

Results

Forty-two nursing staff were observed and self-reported their activities in emergency department, ICU and CCU over a period of 5 weeks. Fifty-seven work-study data were collected, fifteen from observation and forty-two from self-reporting. Three work activities (direct patient care, indirect care, and personal activities) concluded the nurses' work. Table 2 shows the comparison of two techniques; indicating that there was a significant difference in time distribution of direct care and personal activities between the two techniques. The two techniques showed no significant difference in the proportion of time spent on the indirect care activities (24.09% versus 28.84%, p>0.05).

Discussion

In the present study, the time that nursing staff spent on activities in the emergency department, ICU and CCU wards was compared with the self-reporting technique, in order to find out the productivity of these professionals.

The two techniques yielded significant differences in the time distribution of nurses, since the observational study indicated less patients' care (32.71%) and more personal activities (42.28%). The percentage of direct care activities in the two methods (32.74% versus 40.52%) in this study was compared with another study which yielded differences in the observational vs. self-reporting method(40% versus 33%) [20]. Also another study which was carried out in USA with the aim of comparing the results of self-reporting with the time and motion observation, demonstrated that the mean direct care activity time was significantly longer using self-reporting method rather than observation [14]. The difference between the two methods has a number of reasons: the definition of categorizations among staff and researchers may vary. Nurses self-reported their activities without using stopwatch that may have led to small variation in time study of activities between the two methods. In addition, the presence of an observer (Hawthorne effect) may influence the nurses' activities. Workload, setting, and patients' acuity are other possible reasons for such differences between the two methods.

Data from observation was compared with another time and motion study in Iran which showed that nurses spent 46.46% of their time on direct care activities, 15.18% on documenting activities, 7.43% on patient assessment, 6.32% on indirect care activities, 2.21% on non-nursing duties and 22.5% on personal activities [21]. The percentage of direct care activities in the emergency department (27.18%) (Appendix 1), was compared with other studies in the emergency department using different classification and methodological procedure. While in a study [18] this percentage was 35%, in another study it was 25.6% [22] which was less than what was identified in our study. In another research aimed at comparing physicians' and nurses' time distribution in the emergency department, nurses spent 34% of their time on direct care [23]. In Australia the percentage of direct care activities were observed around 33-40% [24-28]. The percentage of nurses' time spent on indirect interventions in ICU in this study (20.66%) (appendix 2), was less than another research which was carried out in the intensive care unit of a private hospital in Queensland (32.4%) [24]. Indirect care activities in other findings ranged from 6.4% [29] undertaken in a nursing home to 55% [30] carried out in a surgical unit in Montreal. Different categorization among studies can be the main cause of the differences. For example, communication with patients are categorized differently [24, 29, 31]. Medication preparation was considered as a a direct care in an Australian study [24] while it was considered as an indirect one in our study. Personal activities which involved 42.05% of the nurses' times in the 3 units, was in contrast with other studies 12%, 5.1%, 2.5%, 17%, 18% and 19% [26,29-33]. Definition of this category and included tasks differs among studies; for example, in one study break and meal times were excluded from total work hours, so the percentage of the personal activities was calculated 2.5% [30]. Also shift and day selection differs in some studies, for example in 2 studies only day shifts, Monday to Friday were observed [24, 26]. In another study in an emergency department, only the registered nurses were observed [22].

Conclusion

Based on the results of this study, we concluded that although the observation results were somewhat different from self-reporting, in both methods, personal activities had the highest volume of activity and direct and indirect care were in the next place.

Conflict of interests: The authors declare no conflict of interest.

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Appendix 1: Results of observation and self-reporting study of nursing activities in the emergency department

Order	Activity	Sum of nursing activities in each shift (min) in ED					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=3)	Observation (n=2)	Self-reporting (n=3)	Observation (n=1)	Self-reporting (n=3)
	Direct care activities						
1	Serum therapy	14.00	39	9.00	32	7.00	40
2	Monitoring	14.00	16	13.00	38	10.00	48
3	Vital signs control	2.45	25	8.00	36	11.00	48
4	Venous injection	4.00	21	16.04	23	9.00	34
5	ECG	5.00	19	17.00	21	7.00	38
6	Drug order	4.13	28	14.00	25	10.00	45
7	Blood pressure control	34.00	48	33.00	39	38.00	54
8	ABG	22.00	36	23.34	43	30.00	62
9	Suction	6.67	15	19.00	23	12.00	38
10	Nasogastric tube feeding	7.00	26	8.00	12	-	45
11	Changing branol	15.00	12	19.00	28	16.00	34
12	Position change for patient	57.00	0	-	48	-	-
13	Glucose test	8.00	11	11.00	16	-	30
14	Fever control	-	13	2.03	32	-	50
	Total in minutes	194	309	193	384	150	566
	Total in percent (%)	26.94	28.61	26.80	35.55	27.77	34.93

Order	Activity	Sum of nursing activities in each shift (min) in ED					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=3)	Observation (n=2)	Self-reporting (n=3)	Observation (n=1)	Self-reporting (n=3)
Personal activities							
1	Meals	47.00	58	70.00	63	28.40	109
2	Drinks	21.00	38	62.00	40	15.00	67
3	Personal work	52.00	62	71.00	91	15.00	180
4	Rest	95.00	143	63.00	130	98.00	205
5	Other activities such as reading books, talking with friends. etc.	73.00	80	56.00	30	64.00	98
	Total in minutes	194	309	193	384	150	566
	Total in percent (%)	26.94	28.61	26.80	35.55	27.77	34.93

Order	Activity	Sum of nursing activities in each shift (min) in ED					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=3)	Observation (n=2)	Self-reporting (n=3)	Observation (n=1)	Self-reporting (n=3)
Indirect care activities							
1	Shift transfer	43.00	62	28.30	52	32.10	75
2	Documentation	52.05	80	54.45	85	58.45	79
3	Drug preparation	37.11	51	23.13	63	18.01	70
4	Admission, discharge	29.45	49	15.33	26	-	34
5	Hand washing	15.00	28	20.00	38	23.14	40
6	Telephone communication such as reporting laboratory result, calling physicians, etc.	23.30	59	25.03	42	15.30	52
7	Personal communication such as consulting with physicians and nurses, etc.	38.12	61	39.00	36	23.20	45
	Total in minutes	238	390	205	342	170	395
	Total in percent (%)	33.05	36.11	28.47	31.66	23.61	24.38

Appendix 2: Results of observation and self-reporting study of nursing activities in ICU

Order	Activity	Sum of nursing activities in each shift (min) in ICU					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=6)	Observation (n=2)	Self-reporting (n=6)	Observation (n=1)	Self-reporting (n=6)
	Direct care activities						
1	Serum therapy	26.23	76	24.00	81	4.13	153
2	Monitoring	36.54	81	12.00	49	22.58	148
3	Vital signs control	20.32	18	7.15	55	4.05	71
4	Venous injection	15.00	52	11.33	38	14.03	88
5	ECG	16.00	72	32.00	71	10.5	150
6	Drug order	34.06	91	15.23	89	8.42	163
7	Blood pressure control	17.25	20	21.03	32	15.2	34
8	Blood	13.10	41	19.30	46	18.27	51
9	Suction	14.56	53	10.10	50	18.24	79
10	Nasogastric tube feeding	17.00	42	19.18	51	8.11	109
11	Heart rate control	14.13	31	1.50	29	3.45	66
12	Position change for patient	14.31	18	2.07	40	10.2	51
13	Glucose test	-	16	6.50	26	6	72
14	Fever control	-	29	3.27	33	-	54
	Total in minutes	238	640	184	690	143	1289
	Total in percent (%)	33.05	29.62	25.55	31.94	26.48	39.78

Order	Activity	Sum of nursing activities in each shift (min) in ICU					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=6)	Observation (n=2)	Self-reporting (n=6)	Observation (n=1)	Self-reporting (n=6)
Personal activities							
1	Meals	55.00	165	75.00	146	30.45	280
2	Drinks	29.20	120	26.10	138	18.26	190
3	Personal work	34.13	184	35.32	89	47.13	259
4	Rest	113.00	210	177.00	166	116.00	310
5	Other activities such as reading books, talking with friends. etc.	44.00	111	67.00	181	63.00	251
	Total in minutes	275	790	380	720	274	1290
	Total in percent (%)	38.19	36.11	52.77	33.33	50.74	39.81

Order	Activity	Sum of nursing activities in each shift (min) in ICU					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=6)	Observation (n=2)	Self-reporting (n=6)	Observation (n=1)	Self-reporting (n=6)
Indirect care activities							
1	Shift transfer	39.16	153	33.00	160	24.50	132
2	Documentation	57.06	180	38.00	205	25.00	180
3	Drug preparation	26.23	210	22.45	191	16.32	164
4	Admission, discharge	10.29	51	17.42	40	13.00	36
5	Hand washing	13.14	40	13.10	46	17.06	45
6	Telephone communication such as reporting laboratory result, calling physicians, etc.	25.38	35	16.20	51	16.40	51
7	Personal communication such as consulting with physicians and nurses, etc.	36.54	61	16.00	57	11.21	53
	Total in minutes	207	730	156	750	123	661
	Total in percent (%)	28.75	33.33	21.66	34.72	22.77	20.37

Appendix 3: Results of observation and self-reporting study of nursing activities in CCU

Order	Activity	Sum of nursing activities in each shift (min) in CCU					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=5)	Observation (n=2)	Self-reporting (n=5)	Observation (n=1)	Self-reporting (n=5)
	Direct care activities						
1	Serum therapy	20.46	51	12.30	62	10.5	130
2	Monitoring	45.33	120	46.12	90	8.29	151
3	Vital signs control	25.3	115	20.00	92	43.27	85
4	Venous injection	33.26	91	-	87		89
5	ECG	26	105	46.23	138	38.32	160
6	Drug order	10.15	129	67.00	109	14.15	172
7	Blood pressure control	18.08	31	29.14	91	22.38	94
8	ABG	35	65	32.05	64	16.45	100
9	Suction	36	71	-	105	23.46	61
10	Nasogastric tube feeding	26.08	40	6.40	59	20	106
11	Changing branol	7.02	25	13.25	40	3.5	58
12	Position change for patient	10.39	31	15.00	38	8.36	60
13	Glucose test	18.13	46	3.08	75		95
14	Fever control	13.27	30	11.32	20	15.2	64
	Total in minutes	324	950	301	1070	223	1425
	Total in percent (%)	45	52.77	42	59.44	41	52.59

Order	Activity	Sum of nursing activities in each shift (min) in CCU					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=5)	Observation (n=2)	Self-reporting (n=5)	Observation (n=1)	Self-reporting (n=5)
Personal activities							
1	Meals	65	94	65	57	75.01	205
2	Drinks	18.23	31	24.13	12	21	94
3	Personal work	38.45	75	42.2	22	38.08	148
4	Rest	45.12	80	63	50	77.23	181
5	Other activities such as reading books, talking with friends. etc.	71	35	61	19	32.4	162
	Total in minutes	237	315	255	160	243	790
	Total in percent (%)	32.91	17.5	35.41	8.8	45.13	29.62

Order	Activity	Sum of nursing activities in each shift (min) in CCU					
		Morning		Evening		Night	
		Observation (n=2)	Self-reporting (n=5)	Observation (n=2)	Self-reporting (n=5)	Observation (n=1)	Self-reporting (n=5)
Indirect care activities							
1	Shift transfer	21	91	22	110	10.4	61
2	Documentation	40	84	46.24	76	9.56	80
3	Drug preparation	23.25	110	30.5	119	13.46	105
4	Admission, discharge	10	59	13.28	84	9.2	67
5	Hand washing	13.16	35	24	64	8.24	49
6	Telephone communication such as reporting laboratory result, calling physicians, etc.	24.45	81	10.14	81	18.1	87
7	Personal communication such as consulting with physicians and nurses, etc.	28.03	75	18	36	5.4	36
	Total in minutes	159	535	164	570	74.36	485
	Total in percent (%)	22.08	29.72	22.77	31.66	13.7	17.77