The reality of nursing time: how nurses spend their shifts

Alex Walsby, Sharon Williams, John Gammon and Stephanie Best

ABSTRACT

Background: Nurse staffing levels are increasingly challenged while pressures on healthcare systems are rising. There is a clear need to optimise efficiency in healthcare delivery in order to deliver safe, effective and quality health care. Aim: To understand how nurses working shifts spend their time and explore opportunities to improve efficiency in care delivery. Method: A time-motion study was conducted on three acute care wards in a district general hospital in West Wales; 13 nurses were observed over 14 shifts, each activity undertaken was recorded in real time. Findings: In all, 109 hours were observed. Approximately half of nurses' time is spent delivering direct patient care, with medications administration taking the majority of time. Conclusion: A number of recommendations are made involving processes and workforce modelling with the aim of improving efficiency and safety. Further research would be required to assess the impact of their introduction.

Key words: Nursing time ■ Nursing duties ■ Nursing tasks ■ Time motion studies ■ Efficiency ■ Multiprofessional working

In the next decade, healthcare services across the UK and elsewhere in the world are expected to face significant workforce challenges in delivering quality health care. It is predicted that patient outcomes and staff experiences will be affected (Beech et al, 2019). Nurse vacancy rates have reached record levels, while nursing absences have increased (Hunter, 2022). Demands on the system, such as waiting times in emergency departments, for diagnostic testing, and routine treatments, have also increased (Royal College of Nursing (RCN) Wales, 2022). In Wales, the RCN estimated 2900 nursing vacancies in September 2022, and increasing reliance on agency nurses (RCN Wales, 2022).

Providing safe, effective patient care depends on adequate staffing levels, and is not always achieved when deploying temporary nursing solutions; these have been shown to be associated with patient mortality (Dall'Ora et al, 2019). To achieve good quality efficient care nursing roles must be carefully balanced to avoid either overstaffing or understaffing wards, and consequent inefficacies, staff burnout (van den Oetelaar et al, 2018) and poor patient care.

To inform decisions concerning efficiency an in-depth understanding of how nursing time is spent during shifts is useful. It can identify opportunities to eliminate tasks with questionable value (Lim and Ang, 2019), and to focus nursing time on activities that contribute to patient care and improve safety (Smeds Alenius et al, 2014). Time-motion studies enable the collection of reliable and detailed field data (Michel et al, 2021), thereby making this an appropriate methodology for this study.

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Background

Time-motion studies have been used in health care since 1914. They are a blended methodology of two approaches: one focusing on time and the other on motion. The aim of time-motion studies is to determine the amount of time taken on a task (time) and the desire to make processes more efficient by reducing the movement of healthcare staff (motion) (Lopetegui et al, 2014). Finkler et al (1993) described the time-motion process as an observation that records the exact amount of time spent on each task by continuously following a person for a predetermined amount of time.

Time-motion methodology has been used by hospital managers and researchers to assess inefficiencies in healthcare delivery, which now includes a focus on the safety and quality of patient care (Lopetegui et al, 2014). The process was further refined (Kalne and Mehendale, 2022) to ascertain the time taken by skilled workers to complete specific tasks to specific standards, without assessing the quality of the outcome (Michel et al, 2021).

Aim

The aim of this study was to investigate and document the duties, tasks and time spent by nurses working shifts on acute care wards in a district general hospital in West Wales. The primary objective was to identify whether there were any opportunities for improvement in care delivery and to assess whether any change that might include the reallocation of staff within the bounds of financial and resource allocations (Michel et al, 2021) could improve the delivery of care. The study sought to gather baseline data on which to formulate recommendations, applicable to clinical areas, of potential workforce models designed to improve efficiency of care delivery.

Design

Put simply, time-motion studies measure time taken by skilled people to complete tasks (Kalne and Mehendale, 2022). They may be applied to different tasks and result in assessing the number of staff required to carry out tasks efficiently. The methodology on which this study was designed aligned with a study conducted by Lim and Ang (2019) whereby nurses were observed throughout their shifts by a registered nurse. Observations were undertaken across 24 hours in an assessment ward, a medical ward and a surgical ward. All shifts were observed at 5-minute intervals. Ideally, a different nurse would have been observed on each shift; however, one nurse on the medical ward was shadowed twice due to the small pool of nurses available. The researcher decided not to participate in the delivery of patient care, nor listen to information being discussed during the handover processes both of which were, however, timed. *Table 1* shows when the observations were conducted.

Participants

Typically, time-motion studies have a small number of participants, but the time spent observing is large relative to the number of participants (Finkler et al, 1993). In this study, three clinical specialties were observed to identify nuances between them. Minimal inclusion criteria applied to nurses included nurses who were in permanent employment in the clinical area and those who agreed to being observed. Nurses working in temporary roles were excluded to ensure that all those observed were familiar with the policies and processes of the health board, and the specifics of the ward (culture, routines, specialties, processes). The ideal would have been to observe experienced nurses who had been registered for more than 12 months, however this was not always possible.

Data collection

Bryman (2016) explained that researchers conducting observational studies must follow explicitly formulated rules in order to observe systematically the direct behaviour of individuals. Observation schedules inform what should be observed, and the mechanisms for recording observations. When conducting time-motion studies, the researcher may video-record subjects and analyse the recordings either concurrently or at a later point. This approach may reduce the potential impact of researcher influence, known as the Hawthorne effect (Lopetegui et al, 2014), but in this study there were too many factors outside the researcher's control which made it impossible. They included the environment layout and available resources; therefore, direct observation was undertaken.

A pre-populated data collection tool was designed listing the common nursing duties. It allowed one task and the amount of time it took to be recorded at a time. When nurses were observed to be multitasking, the researcher recorded only the main task in accordance with Michel et al's (2021) research. The lead researcher's nursing knowledge and experience were used to compile the task list, and it was intentionally basic so that additional tasks could be added as observed. This allowed for flexibility in the clinical areas observed.

Table 1. Time period of observation

Ward	Observations commenced	Observations finished
Admission ward	15 July 2022	27 August 2022
Medical ward	28 September 2022	11 October 2022
Surgical ward	5 April 2023	19 April 2023

Ethical considerations

The study followed the NHS Health Research Authority (HRA) policy framework for health and social care research: it was assessed to be a service evaluation because it was designed to observe the existing delivery of care and to assess whether there were areas for improvement. The evaluation also looked to understand what standard of care was being achieved in line with HRA guidance. For internal purposes, the study was registered with the health board as a service evaluation study.

The study was commissioned by the Director of Nursing for the health board, and permission was given by the senior nursing team for each area in which observations were conducted. An overview of the research aims was emailed to each ward manager, explaining the process and requirements from the ward. The observer described the process and intent of the study to the nurses before asking for their verbal consent. No patient information was collected, nor information of any professionals, and all ward data were anonymised. Patient confidentiality, privacy and dignity were protected as the researcher did not directly observe episodes of care (for example, hygiene care), or participate in patient handovers to avoid hearing patient information.

Data analysis

Descriptive statistical analysis, which was used to evaluate the data collected, provide an organised summary of data by explaining the relationship between the variables within the sample (Kaur et al, 2018). The time-motion studies conducted were a starting point from which to develop an understanding of the roles and tasks undertaken by nurses daily, and therefore each of the clinical area was analysed independently to produce results reflecting that area. In line with Lim and Ang (2019), the results were calculated in percentages of time and presented in graphs, as recognised by Holcomb (2017) as a common means of organising and displaying data. The average time spent on each task for each area was calculated using the total minutes spent on the ward and the total number of minutes spent on each task across all shifts.

Results

Observations were carried out on a general medical ward with a focus on frailty; a surgical ward specialising in trauma and orthopaedics; and a mixed specialty admissions and assessment ward. Thirteen nurses were observed over 14 shifts. Five of the nurses were in charge of the ward alongside their allocated patients. It was common for nurses on the medical and surgical wards to undertake the dual responsibilities of nurse in charge and caring for patients, whereas the assessment ward had a designated nurse in charge role.

The nurses cared for between seven and ten patients per shift. They worked eleven and a half hour shifts (either 07:00–19:30 or 19:00–07:30); however, the observer split the day shifts to observe either between 07:00–14:00 or 13:30–19:30. The rationale was to observe as many nurses as possible, and to appreciate the variation in activity levels on a daily basis. All nurses had gained significant nursing experience in Wales, apart from one who was newly registered with the Nursing and Midwifery Council, but had significant experience as a registered nurse overseas. In total, 109 hours, or 6540 minutes, of observations were undertaken between July 2022 to March 2023 as presented in *Table 2*.

Medication administration consistently took the majority of nursing time which averaged 30.1% of time per shift. Time spent administering medication was between 13% and 57.14% per shift, depending on the time of day. Morning medication rounds were typically longer. Another variable was the type of medication prescribed, with more injectable medications occurring on the admissions ward. An anomaly observed on the surgical ward during one shift involved a nurse new in post who was not trained to administer injectable medications resulting in a lower percentage for that shift. The health board's relevant organisational policy stipulates that two registered nurses must check all controlled and injectable medications prior to administration. As a result, the data show a significant amount of nursing time was spent checking the procedure (9.1% average). *Table 3* shows all the tasks undertaken and the time spent on each.

The tasks were classed as direct patient care and non-direct patient care or clinical and non-clinical tasks (*Table 4*). There were 12 tasks in the direct care category (eg hygiene care) and 11 in the non-direct care category (eg documentation). The results show nurses spent more time delivering direct care; however, this was only by a margin of approximately 10%, with the remaining time spent on non-direct care duties. Some non-direct care tasks took nurses away from the patients' bedsides for a significant amount of time, for example, handover processes (12.5% average) and documentation (10.6% average).

The data relating to admissions and discharges of patients showed variation between the areas, but all showed relatively low time spent on admitting and discharging patients. Most time spent on admitting patients was, predictably, on the admissions ward (1.2%), and the medical ward spent the most amount of time discharging patients (4.4%).

Discussion

The researchers aimed to investigate and document the duties, tasks and time spent by nurses working shifts on acute care wards in a district general hospital in West Wales. The primary objective was to identify whether there were any opportunities for improvements in care delivery and efficiency.

A number of nurses were observed and timed carrying out a range of duties in acute ward settings during their shifts. A degree of fluctuation was seen across the wards relating to tasks undertaken by nurses, but, overall, nursing roles and duties were comparable. The data show a differentiation between time given to tasks delivering direct patient care and non-direct patient care as shown in *Table 4*. Slightly more time was given to activities contributing directly to patient care; however, the amount of time spent on non-direct care was notable. This finding is inconsistent with Michel et al's (2021) literature review findings in which 20–38% of nursing time was spent delivering direct care, however opportunities can be identified to improve efficiency and productivity on the wards studied.

The importance of improving efficiency and productivity on the morale of nurses explored by Lindqvuist et al (2014), suggest that a direct correlation exists between the delivery of direct care and job satisfaction. Smeds et al (2014) also found a link, perceived by staff, between the ability of nurses to provide direct patient care and improved patient safety. However, patient safety and quality of care indicators were not assessed as part of this study.

Medication administration took most nursing time per shift (30.1%), and the checking process for injectable medications was also significant (9.1%). The second checking procedure did, in the majority of cases, result in interruptions to medication administration processes, which can increase the risk of errors occurring (Westbrook et al, 2010). A key recommendation of this study is the consideration of single-nurse checking and administration processes for injectable medications, excluding controlled drugs. Speight and Dixon (2021) supported this recommendation because it reduces interruptions associated with errors, and improves efficiency, autonomy and empowerment of nurses. Westbrook et al (2010) also found a reduction in medication errors and improved job satisfaction for nurses who administered medications independently. Controlled drugs are excluded due to the specific considerations that need to be applied as per the Misuse of Drugs Act 1971 and the Department of Health (2013) recommendations regarding the Controlled Drugs (Supervision of management and use) Regulations 2013.

Nursing handovers transfer patient information from one shift, or one nurse, to the next. A significant amount of time was spent undertaking this critical task on all shifts (12.5% average per shift). Patient safety may be threatened by a failure to transfer key information which becomes lost or forgotten (Smeulers et al, 2016), but handover processes could be improved and should result in increased efficiency. Although there is an absence of standardised tools or processes to guide handovers (Smeulers et al, 2014), many researchers have recommended using a structured tool (McFetridge et al, 2007; Croos, 2014; Anderson et al, 2015). Taped handovers, followed by a bedside review, have the benefit of maintaining patient confidentiality (Anderson et al, 2015), while allowing for a joint review of bedside documentation and the opportunity for questions (Sullivan, 2007; Liu et al, 2012). If this practice were to be adopted, its evaluation would be advisable.

This study reveals potential opportunities to implement a workforce modelling approach that uses other staff groups and roles to support the delivery of direct and non-direct care. One such role could be the assistant practitioner, introduced into the NHS in 2002 to work under the delegation of registered health professionals. The scope of the role covers the management of patient caseloads, and clinical decision-making within their scope of practice and competence (RCN, 2019), and the

Table 2. Clinical areas and staff sample sizes

Clinical area	Early shifts		Late shifts		Night shifts		Total minutes	No. of nurses shadowed per area
	No. of shifts	Minutes spent	No. of shifts	Minutes spent	No. of shifts	Minutes spent		
Assessment ward	2	840	2	780	1	750	2370	5
Medical ward	2	840	1	330	1	750	1920	3
Surgical ward	2	780	2	720	1	750	2250	5
Overall total							6540 minutes/109 hours	13 nurses/14 shifts

Table 3. Activities undertaken by nurses and the time taken in minutes and percentage of shift

Ward area	Admission ward		Medical ward		Surgical ward		Average	
Total minutes on each ward	2370		1920		2250			
Task	Minutes	%	Minutes	%	Minutes	%	Average minutes	Overall average %
Medication administration	810	34.2	580	30.2	585	26	658.3	30.1
Handover	320	13.5	255	13.3	240	10.6	271.6	12.5
Documentation	320	13.5	135	7	260	11.5	238.3	10.6
Fundamentals of care/moving and handling/hygiene	155	6.5	100	5.2	390	17.3	215	9.6
Second check of medications	195	8.2	190	9.9	210	9.3	198.3	9.1
Breaks	160	6.75	190	9.9	180	8	176.7	8.2
Clinical procedures/clinical reviews/end-of-life care	150	6.3	130	6.7	140	6.2	140	6.4
Liaison with multidisciplinary team (including site manager)	40	1.7	120	6.25	100	4.4	86.6	4.1
Admin/clerical duties	55	2.3	35	1.8	125	5.5	71.6	3.2
Liaise with doctor/advanced nurse practitioner	95	4	40	2	50	2.2	61.6	2.7
Liaise with patients' families	50	2.1	60	3.1	35	1.5	48.3	2.2
Liaise with patients	55	2.3	20	1	70	3.1	48.3	2.1
Covering breaks	65	2.7	60	3.1	0	0	41.6	1.9
Discharge planning/discharging patients	0	0	85	4.4	20	0.8	35	1.7
Cleaning/stocking/bed making	85	3.5	30	1.5	0	0	38.3	1.6
Clinical referrals	0	0	10	0.5	85	3.7	31.6	1.4
Sourcing of stock/equipment	20	0.8	25	1.3	30	1.3	25	1.1
Admitting new patients	30	1.2	10	0.5	25	1.1	21.6	0.9
Ward management/patient flow	30	1.2	25	1.3	5	0.2	20	0.9
Physical observations	45	1.9	0	0	10	0.4	18.3	0.8
Ward/board rounds	15	0.6	35	1.8	5	0.2	18.3	0.8
Nutrition and hydration for patients	20	0.8	0	0	20	0.8	13.3	0.5
Night checks	0	0	15	0.8	0	0	5	0.2

administration of medications (O'Flanagan, 2014). Another role with the potential to support medications administration is that of pharmacy technicians. Their introduction could release nursing time, optimise medication administration, and support the education of patients (Woodward et al, 2019). Additionally, administrative staff may reduce the amount of time spent on non-direct care duties. The benefits of administrative support include improvements in staff wellbeing; in leadership; in human resources processes; and in developing future nurse managers (El Haddad et al, 2019). Previous research showed that increased use of administrative staff impacted the wider ward team by enabling the ward manager to be more clinically visible (Somerville and Morrison, 2018).

Furthermore, non-clinical ward housekeeper roles whose duties include cleaning, stocking, food services, and maintenance (May and Smith, 2003) could be considered a valuable asset to the ward team. Hurst's (2010) evaluation of the housekeeper role found that it allowed nurses more time with patients, had a positive effect on quality standards, and increased job satisfaction and morale (Tye et al, 2012). Research undertaken to date has shown all of the roles discussed contribute positively to patient care. However, no research has yet been done on the building of a team with the addition of more than one additional role.

Limitations

This service evaluation has a number of methodological and study-specific limitations.

First, the methodological limitations: observational studies provide a method of assessing the effectiveness of many aspects of health care, while acknowledging there are a number of challenges when undertaking observational research, most notably the risk of bias (Thomas, 2020). One challenge is the need to abide by the boundaries necessary to collect accurate data which forbids interference in the processes being undertaken, and allows for recording only (Cochran, 2015). In addition, time-motion studies are recognised as being extremely labour intensive due to the one-to-one process of observations (Finkler et al, 1993) and are therefore often limited to a small number of participants (Kalne and Mehendale, 2022). Nevertheless, the information gained from this observational study could not have been gathered by other means, and has highlighted areas and processes that could be improved and lead to greater efficiency, job satisfaction and patient safety.

Regarding study-specific limitations, the first would be the decision to use a data collection tool recording 5-minute intervals. If smaller time intervals were applied , the data would be more accurate and would allow for the tracking of fragmented tasks and the quick turnaround from one task to another (Lopetegui et al, 2014). Second, despite conducting the study on wards with different clinical specialties, the results are still limited in the extent to which they can be generalised due to different clinical practices between health boards, hospitals and wards, all of which limits their external validity. Finally, there was a risk of subjectivity and bias in this evaluation introduced by the use of a researcher (AW) integral to the organisation (Greene, 2014). In particular, the research team were aware of the potential for confirmation (observer) bias where there is a tendency to seek out information that supports

Table 4. Clinical and non-clinical tasks

	Clinical tasks	Avg min	Avg %	Non-clinical tasks	Avg min	Avg %
1	Medication administration	658.3	30.1	Handover	271.6	12.5
2	Fundamentals of care/moving and handling/hygiene	215	9.6	Documentation	238.3	10.6
3	Clinical procedures/clinical reviews/ end-of-life care	140	6.4	Second-check of medications	198.3	9.1
4	Liaise with multidisciplinary team (including site manager)	86.6	4.1	Breaks	176.7	8.2
5	Liaise with doctor/advanced nurse practitioner	61.6	2.7	Admin/clerical duties	71.6	3.2
6	Liaise with patients' families	48.3	2.2	Covering breaks	41.6	1.9
7	Liaising with patients	48.3	2.1	Discharge planning discharging patients	35	1.7
8	Clinical referrals	31.6	1.4	Cleaning/stocking/bed making	38.3	1.6
9	Admitting new patients	21.6	0.9	Sourcing of stock/equipment	25	1.1
10	Physical observations	18.3	0.8	Ward management/Patient flow	20	0.9
11	Ward/board rounds	18.3	0.8	Night checks	5	0.2
12	Nutrition and hydration for patients	13.3	0.5			
	TOTALS	**1361.2 minutes**	**61.6%**		**1121.4 minutes**	**51%**

our existing beliefs. Confirmation bias can also result from being overconfident and missing or ignoring contradictory results (Althubaiti, 2016). The potential for confirmation bias was recognised, regularly discussed and attempts to mitigate its impact on the study were taken through regular team meetings. The diverse backgrounds and professions of the team provided differing opinions and encouraged the objective analysis of the data (Althubaiti, 2016). The iterative nature of the study design also minimized the possibility and effects of bias along with the recognition for its potential as reported here.

Conclusion

Improvements could be made in existing processes and through changes to the workforce modelling. *Table 5* highlights the challenges experienced by registered nursing staff during this study, with suggested solutions and potential outcomes.

As suggested in *Table 5*, consideration could be given to changes in workforce models. Various pieces of research have looked at the addition of various roles, but there has been no comprehensive study of building a team around the patient in clinical settings. This evaluation makes four potential workforce recommendations; however, it is important to recognise that differences between health boards, hospitals and wards means that there must be a degree of flexibility in planning appropriate workforce models.

In the UK, nurse staffing levels have been under increasing public scrutiny since the Francis Report (Francis, 2013) exposed staffing deficits as a prominent cause of failings in health care (Ball, 2020). Critically, it is recognised that suboptimal nurse staffing models result in suboptimal care delivery to patients (Nickitas and Mensik, 2015). This study has identified a number of opportunities to improve efficiency, both in workforce modelling and productivity. The authors recommend further research to evaluate a team of staff groups working collaboratively and providing a mix of direct and non-direct patient care. **BJN**

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Table 5. Challenges, solutions and anticipated outcomes

Challenges	Solutions for consideration	Potential outcomes
Time spent on the handover process	Consider the use of taped handovers	■ Less interruptions experience ■ More focus on the handover information and not distractions
Time spent administering medications	Implement a single nurse administration process for injectable medications Delegate medications administrations to pharmacy technicians	■ Reduce interruptions to medications administration ■ Release nursing time ■ Release of nursing time ■ Use of professionals with expert knowledge to increase medications safety
Vacancies in registered nursing workforces	Implement assistant practitioners into ward staffing models	■ Delegate the care of cohorts of patients to the assistant practitioner ■ Use staff to the top of their competence ■ Release of registered nursing time
Ward managers time commitment to administrative tasks	Implement ward administrators in the ward staffing model	■ Release ward manager time to the clinical environment
Time spent by staff seeking resources	Implement housekeepers into the ward staffing model	■ Ensure staff have the required resources to deliver patient care ■ Release staff time from sourcing resources

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KEY POINTS

- Nurses spend a significant amount of time on tasks that do not contribute to direct clinical care, including administrative and co-ordination processes
- There are a number of opportunities to improve efficiency to nursing care by reviewing clinical processes and workforce modelling
- A multiprofessional approach to workforce planning will result in the deployment of staff with the right skills and competence to contribute to patient care, while releasing registered nursing time.
- Further research is required into the impact of multiprofessional approach to workforce modelling, and the impact on patient safety, quality and experience

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CPD reflective questions

- Consider the time you spend on different aspects of direct and indirect patient care. Can you suggest, for example, ways to improve the handover processes to improve increased efficiency?
- Reflect on an occasion where you worked as part of a multiprofessional team. How did task allocation among different members contribute to meeting the needs of patients?
- What do you envisage as the enablers and barriers to involving health professionals and support workers in a multidisciplinary team in your area of work?