Duration of In-patient Physical Therapy at a Tertiary Hospital: Implications of a Time and Motion Study

Maribeth Anne P. Gelisanga, MPT,[1] John Henry A. Ocden, PTRP, MOH[2] and Jorell Victor S. Angeles, DPT, PTRP[3]

[1]*Philippine General Hospital, University of the Philippines Manila*
[2]*Division of Physical Therapy, Department of Rehabilitation Medicine, Philippine General Hospital, University of the Philippines Manila*
[3]*De La Salle Medical and Health Sciences Institute*

ABSTRACT

Background and Objectives. Inpatient physical therapy (PT) care entails careful provision of service for individuals across a spectrum of disorders needing evidence-based physical rehabilitation during their hospital admission. The main difficulty is identifying adequate time allocation for safe patient service within an eight-hour working time frame. At a selected tertiary teaching government-run hospital, an arbitrary personnel-population ratio method is used for human resource allocation which may lead to issues in service delivery and healthcare workforce wellness. Apart from patient care, physical therapists also assume non-clinical roles revolving on administration, clinical education, and research. This highlights the importance of identifying the duration of tasks to assess work efficiency and manage time constraints posed by the limitations of the work shift. Practice guidelines may help improve staff workload scheduling, however, there is a lack of available guidelines regarding physical therapy practice in the hospital or acute care setting for developing countries. The purpose of this study was to determine the duration of care for inpatients with musculoskeletal and neurological conditions and administrative tasks, and to determine the relationship of duration of care with months of experience.

Methods. A continuous observation time motion study of a typical workday of all physical therapists in an in-patient setting of a tertiary teaching hospital was conducted. An external observer will time the tasks done by the PT. The external observer kept distance from the direct patient encounter to minimize interference that may affect timing. Patients with conditions of different etiologies and functional levels were included.

Results. Nineteen physical therapists with a mean experience of 54.63 months were observed. There were no adverse events during the implementation of this study. The total mean time in minutes of management of neurological patients is 37:32, and musculoskeletal patients is 28:30. Time for administrative tasks took an average of 20:33 minutes. There was also a low positive correlation on months of experience and treatment duration for patients with neurologic conditions (p=0.0471). Results showed that the allocated treatment duration is determined to be sufficient for performing PT activities. The optimal number of patients to be decked can also be appropriately determined to optimize resource allocation.

Conclusion. Our pilot study attempted to quantify the duration of PT care in an inpatient setting that caters to patients with different diagnosis and varying needs for PT management. Although descriptive statistics and a weak to insignificant correlation was seen in most of the variables, there may be some benefit in gathering more duration data across different acute care settings within the country. Our pilot time and motion study can contribute to the limited evidence of duration of inpatient care that may inform human resource allocation, deliverables prioritization, and employee wellness and development. Figures have been presented which could be the basis for future policy research for management science and resource allocation studies.

Keywords: in-patient care, duration, tertiary hospital

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Corresponding author: Maribeth Anne P. Gelisanga, MPT
Philippine General Hospital
University of the Philippines Manila
Taft Avenue, Ermita, Manila 1000, Philippines
Email: mpgelisanga@up.edu.ph
ORCiD: https://orcid.org/0000-0002-4190-1062

INTRODUCTION

In-patient physical therapy care entails provision of service for individuals across a spectrum of disorders needing physical rehabilitation during their hospital admission. These disorders include musculoskeletal cases, cardiovascular disorders, neurological cases, and other relevant conditions needing physical therapy care. The main difficulty with this array of disorders for a physical therapist is to adequately allocate time for each of these patients. Adequate time allocation includes provision of pertinent physical therapy care that achieves therapeutic goals, completion documentation and accomplishment of administrative duties within an eight-hour working time frame. Furthermore, hospital administrators and managers must be able to adequately create policies that optimize physical therapy care to serve the maximum allowable clients but still preserve the quality of service provision.

Different methods of identifying workload for staff are available for use in healthcare facilities. At the selected tertiary hospital, personnel-population ratio method is used in the allocation of human resources for patient care services. This method is best used in countries with acceptable health service conditions. However, this entails intensive labor and depersonalized service provision leading to unrealistic staffing levels, underutilization or overutilization of personnel, and potential patient service complaints. To improve staff workload scheduling, allied health professionals may refer to practice guidelines and standards of practice set by their regulating bodies.[1]

However, there is currently a lack of available guidelines regarding physical therapy practices for developing countries in the hospital or acute care setting, which would be a reliable source of information regarding the duration of a physical therapy session. There is only one study which quantifies the duration of usual physical therapy care for conditions but it did not describe the length of time needed to execute modalities and therapeutic exercises.[2] Practice guidelines by developed countries specify the recommended treatment to be administered but not the duration of treatment.[3]

In the context of the Philippine public tertiary hospital setting, there is no recommendation given by the Department of Health or the Philippine Physical Therapy Association as to the recommended duration of physical therapy care, patient-therapist ratio, and treatment to be administered.[4] Usual physical therapy care is done based on treatment referred by a Rehabilitation Medicine specialist. These referrals state the list of treatment or modalities recommended for a specific patient consisting of general treatment or approach. However, there are no specified total duration for the entire list of treatments.

Treatment duration is based on finishing specific evidence-based dosimetry that would give an optimum dose for the treatment to take effect. However, treatment protocols stated on some research which are deemed effective may involve prolonged treatment time. Constraint Induced Movement Therapy (CIMT) for example, is an effective approach in improving upper limb functioning in patients following an acute stroke, but needs six hours to complete.[3] This would be highly impractical since therapists usually treat 8-10 patients for approximately 6-8 hours.

Additionally, staff are also required to perform administrative tasks in conjunction with treatment of patients such as reading of patient charts, documentation of daily notes for all treated patients, charging, equipment care, and other duties which take additional time.

The physical therapist staff are expected to perform multiple tasks in their work environment likely being more exposed to demand overload. In the job demands-resources (JD-R) model, one of the dual processes related to occupations is the health impairment process which specifies that work overload is associated with different employee and organizational outcomes of interest affecting employee productivity and well-being.[5] This suggests that factors leading to work overload must be controlled so that the physical therapist staff may perform his/her necessary roles daily without compromising productivity, health, and wellness.

This highlights the importance of identifying usual duration for specific interventions and administrative duties to assess work efficiency and manage time constraints posed by 8-hour work shifts. This information can improve service delivery to patient care services by decreasing potential client dissatisfaction and complaints, refining policies regarding patient-therapist ratios, determining the minimum required number of patients to be treated per work day and providing a guide for clinicians' work planning to maximize health workers' good health and wellness, and improves work efficiency and productivity.

Therefore, this study aims to quantify the duration of physical therapy treatments and administrative tasks given in a tertiary hospital in-patient setting.

OBJECTIVES

1. Determine the duration of physical therapy service in the in-patient care setting in a tertiary hospital in the Philippines
    a. To determine the duration of physical therapy service in the in-patient care setting in a tertiary hospital in the Philippines for musculoskeletal conditions receiving physical therapy treatment.
    b. To determine the duration of physical therapy service in the in-patient care setting in a tertiary hospital in the Philippines for neurologic conditions receiving physical therapy treatment.
    c. To determine the time needed to accomplish administrative tasks of in-patient staff in a tertiary hospital

2. Determine the duration of physical therapy service in the in-patient care setting depending on the type of treatment given namely; common modalities (ROM Exercises, Stretching exercises, Endurance exercises, Pulmonary exercises), bed level (bed mobility, transitions to sitting, sitting balance, tilt table), out of bed (transfers, standing, ambulation), patient and caregiver education, writing documentation, communicating with other rehab professionals, and administrative duties.
3. Determine the relationship of duration of treatment with months of experience.

In-patient physical therapy care is defined in this study as physical therapy care provided in a hospital setting to a patient duly admitted in a ward or private room setting. Usual in-patient physical therapy care is characterized as intensive, of short duration, and specialized for patients across a spectrum of disorders.[6] Patients in this setting often have a complex range of medical conditions, each requiring specialized treatment relevant to their specific condition, constant monitoring of patient status, and careful execution of assessment and intervention procedures guided by precautions.[6] Due to this, therapists must decide how to allocate time to manage treatment for each of these patients, document care provided, and perform administrative duties within an eight-hour working time frame. Reliable decision making should be found in national policies for healthcare service deliveries given by nationally governing bodies or by profession-specific associations that provide standards of practice.[1]

However, the literature review concluded that there are no existing national policies regarding the amount of time to be given for each patient by a physical therapist by the Department of Health or Philippine Physical Therapy Association. This lack of locally available guidelines must then be substituted by a reputable source, within patient healthcare delivery systems that are sufficiently similar.

Although there are differences across countries with in-patient healthcare delivery, the structure and activities of the physical therapy role in acute care internationally have many similarities across health systems in the United States, the United Kingdom and Europe, Canada, South Africa, South America (particularly Brazil), India, Singapore, Hong Kong, Japan, Australia, and New Zealand, with ongoing evolution of the role across Asia.[6] This is the reason why these countries may be the most reliable sources for the therapist to allocate treatment time. The best available evidences for duration of treatment should theoretically be determined through clinical practice guidelines, systematic reviews and meta-analyses of different physical therapy procedures done on a spectrum of patients.[7] However, available literature on clinical practice guidelines provided by developed countries such as Australia[8] and America[9] does not provide recommendations regarding the duration of treatment but only provides recommended strategies to address common problems of patients. Due to this, the PT depends on hospital policies to decide how much time to spend for each patient.

Different methods of identifying workload for staff are available for use in healthcare facilities. At the selected tertiary hospital, personnel-population ratio method is used. It was noted that this method is best used in countries with acceptable health conditions.[1] However, this entails intensive labor and depersonalized service provision leading to unrealistic staffing levels. The level of experience of PTs was found to be directly associated with treatment time allocation. This research study yielded that more experienced PTs spend an "intense dose of time" with each patient in hands-on care, seeking information, and evaluating and educating the patient.[9]

It is therefore important to obtain relevant data regarding treatment duration and help in-patient physical therapists decide regarding patient therapist ratios, workload scheduling, and treatment time allocation. Data gathered can also further help administrators regarding planning of policies with delivery systems for in-patient care.

METHODS

Study Design

A continuous observation time motion study as described by Lopetegui, et al.[10] for physical therapy staff in an in-patient physical therapy clinic in a tertiary hospital was utilized.

Inclusion, Exclusion, and Withdrawal Criteria

Physical therapists were observed during a typical eight-hour workday in the Philippine General Hospital. Participants will be included if: (1) employed in a tertiary hospital with clinical and administrative duties assigned in an in-patient physical therapy clinic; (2) has at least one year of physical therapy experience; (3) possesses a Professional Regulation Commission license as a Physical Therapist Registered - Philippines (PTRP). Participants' workload included administrative tasks and in-patient care patients decked within the day, but participants may also have out-patient care duties.

Sample Size and Design

All nineteen (19) physical therapists who met the inclusion criteria were included.

Data Collection Procedures

Data collection was done for two months at the Physical Therapy Inpatient clinic. The PT clinic is a 20 x 40 m room facility with physical therapy staff lounge, physical therapy exercise equipment, plinths, and chairs. Pay Wards are private rooms that vary from single rooms and 6-patient ward rooms with different cases. These Pay Wards do not have a specific difference in patient population that they cater except the 4th floor which usually have pediatric patients, 6th floor which has an Acute Stroke Unit, a 6-patient ward, and to three ICU

rooms, 2-3 patients each. Floors are divided into left and right blocks. Two nurse stations are posted for each block, for the 4th to 6th floors. One nurse station is posted for each block on the 7th floor. Three elevators are available, two in front which caters to the 1st to 7th floor for the general populace and a service elevator for hospital staff at the back, approximately 20 m away from the front elevator. Stairs between floors are two flights with about 12-15 steps each. Figure 1 depicts the process map of the tasks done by a physical therapist for inpatient care. The PT process starts from the referral from the rehabilitation doctor that states pertinent information on demographics, diagnosis, and PT management.

Two data collection forms were developed by the investigators based on available literature in physical therapy practice in inpatient care[2] and were used in this study, content validated by clinical research experts, and pilot tested. The first form for observation was accomplished by a trained external observer who is also a physical therapist. Stroke or cerebrovascular diseases (CVD) of ischemic and hemorrhagic in etiology was the representative for neurologic cases. Post-operative arthroplasties of the lower extremity specifically of the hip and knee represented the orthopedic or musculoskeletal cases. Other types of strokes and arthroplasties will be excluded. The participants were observed for four separate occasions on a typical eight-hour working day, two for each representative case. The period of data collection is representative of the division's average monthly patient load, on regular weather conditions. Each participant was decked with seven patients daily following a therapist-patient ratio of 1:7 which was set as the decking ratio even before the data collection period but only two therapy sessions for each caseload were allocated for pre-determined musculoskeletal cases and neurologic cases. Each participant was observed only during those four sessions in one data collection day. Prior to observation, the observer reminded the participant of the study objectives and that only the duration of the tasks will be recorded. The quality of the performance of the participants shall not be evaluated, and will not affect the participant's employment. Duration of all clinical and administrative tasks were timed by a stopwatch via a start-and-stop process and recorded using data collection form 1. A total of (38 observations per case were recorded by the external observer given within the two-month rotation. Treatment time started as the therapist enters the patient's room or as

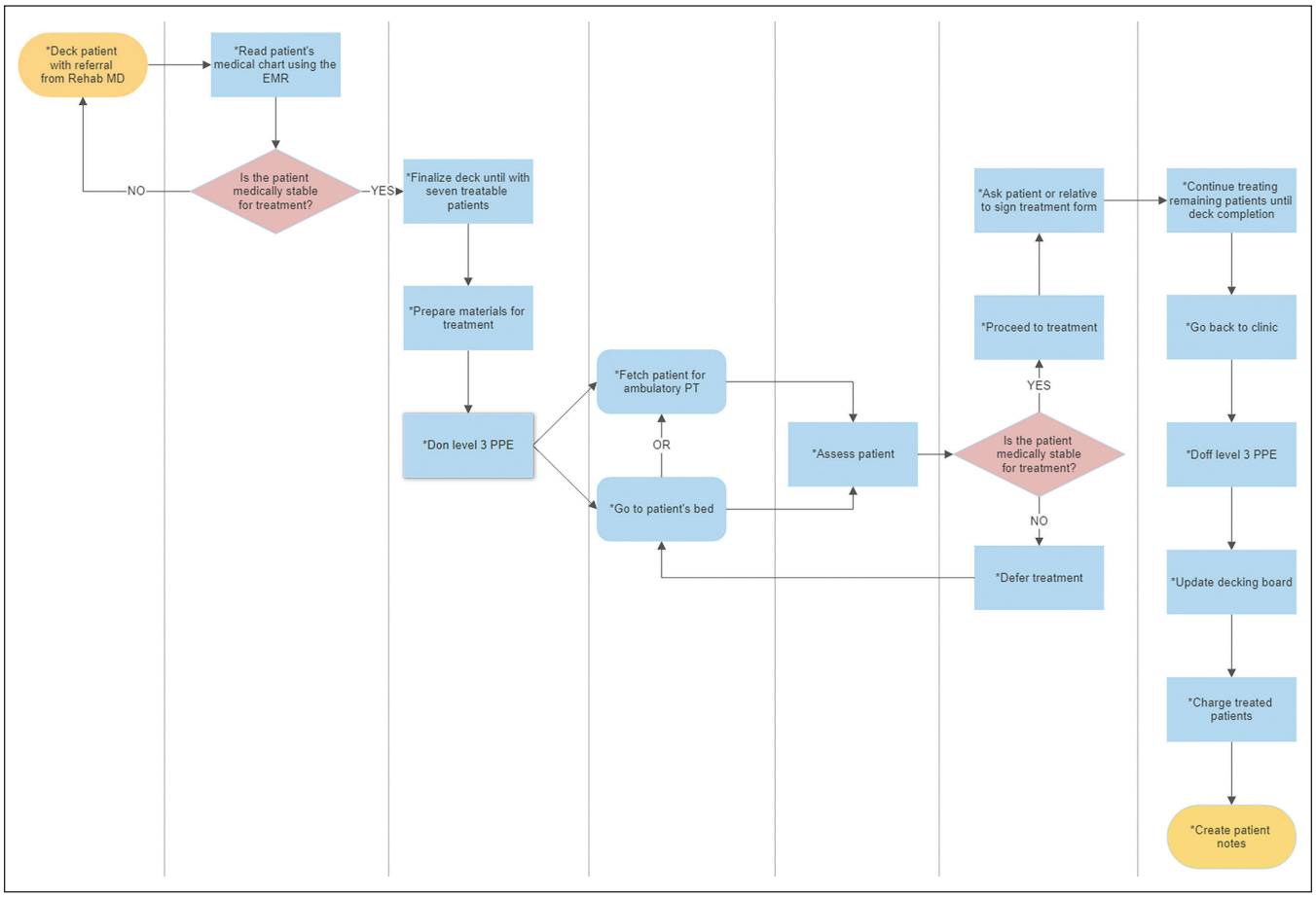

Figure 1. Process map of physical therapist's tasks.

**PT tasks that are timed by an external observer*

the therapist receives the patient for ambulatory clinic at the PTPIPC. Time of application of treatment modality started as soon as the therapist instructed the specific exercise or gave the rationale and ended as the modality or management is removed from the body part or the sets of exercise is finished. Administrative time was recorded as the therapist performed chart reading, documentation of PT session, and inventory duties. Administrative time ended when all tasks relevant to the clinic is finished. Preparation time were recorded as travel time for different locations and equipment preparation for use. Distances traveled by the participant were documented by the observer as part of the remarks for the entire observation session. The observer timed from a certain distance behind the participant to avoid interference on the participant's tasks and patient participation during treatment, and recorded the time using the form immediately. All patients observed yielded a data collection form which was signed and secured at a selected filing location.

The second form is a questionnaire for recording the duration of completion of tasks based on the participant's perspective. The participant accomplished this immediately after the treatment session to prevent recall bias. The administrative time recorded by the participant at the end of the day. The external observer included the time to answer the forms as part of the data. The forms were collected at the end of the day by the external observer and were signed and sealed by the principal investigator.

Training of Observer

One physical therapy graduate was recruited as an external observer to assure familiarity of common treatment modalities done by clinicians. Prior to the data collection period, a training period was held for the external observer. The observer was oriented on the current workplace setting where the observation sessions was implemented and was oriented on measures that uphold data privacy and confidentiality. The observer was asked to sign a conforme stating that s/he shall not have access to the records unless permitted by the principal investigator and that all recorded coded data was delivered to the principal investigator immediately for concealment and storage. The observer was trained specifically on the implementation of data collection form 1 and use of a typical stopwatch during observations. A videotaped tutorial and simulation using the form was done a day prior the implementation to ensure the competency of the external observer. To establish intrarater reliability using the Cohen's Kappa, the observer noted three treatment sessions using the data collection form 1.

RESULTS

All nineteen physical therapists with clinical experience from 12-163 months (mean: 54.63) were observed (Table 1). There were no reported adverse events and client complaints during implementation of this study. This is the first study to record the duration of inpatient physical therapy in a tertiary teaching hospital. The total mean time in minutes of patient management of neurological conditions is 37 minutes 32 seconds, and musculoskeletal conditions is 28 minutes and 30 seconds, respectively (Table 2). Documentation time is 14 minutes, and communication with the care team is 1 minute. The duration of the interventions are summarized in Table 3. Common therapeutic interventions such as stretching and strengthening exercises account for 28-37% of the total treatment time for both conditions. Functional activities, bed level, and out of bed activities such as transitions, transfers, and ambulation training account for 30-57% of the total treatment time. For both conditions, patient and caregiver

Table 1. Demographics

	n	%
Civil Status		
Single	19	100
Married	0	0
Age (years)		
21-25	6	31.58
26-29	11	57.89
≥30	2	10.52
Mean Age (years)	27.05	
Age Range (years)	9 (25, 34)	
Mean Months in practice	54.63	

Table 2. Mean Duration of Physical Therapy Session

	Neuro (Preparation time to PPE doffing)	Musculo (Preparation time to PPE doffing)	Admin
PT 1	1:21:02	1:29:05	0:05:03
PT 2	1:03:02	1:40:31	0:07:00
PT 3	1:02:24	1:28:08	0:07:11
PT 4	1:11:42	1:04:38	0:07:35
PT 5	0:52:06	1:05:18	0:01:23
PT 6	0:51:43	1:06:39	0:03:19
PT 7	0:55:24	1:22:56	0:02:38
PT 8	1:02:32	0:58:25	0:10:26
PT 9	0:58:38	0:53:48	0:01:19
PT10	0:57:05	0:49:31	0:03:37
PT11	0:55:05	1:17:15	0:08:35
PT12	1:04:52	1:18:57	0:07:07
PT13	1:14:19	1:00:11	0:08:04
PT14	0:51:05	1:10:31	0:04:37
PT15	1:02:53	0:49:23	0:09:29
PT16	0:57:29	0:35:22	0:05:07
PT17	0:58:02	1:15:08	0:02:20
PT18	0:50:39	1:13:42	0:04:29
PT19	0:59:32	1:12:43	0:03:02

Table 3. Duration of Intervention for each Modality

	Modalities	Common therapeutic interventions	Bed level activities	Out of bed activities	Caregiver education
Neuro	0:08:04	0:14:26	0:02:40	0:08:58	0:03:24
Musculo	0:00:00	0:08:28	0:03:33	0:12:31	0:03:58

Table 4. Correlation between Months of Experience and Duration of Physical Therapy Tasks

	Pearson's R	Pearson's R interpretation	*p*-value
MSK patient care	-0.2319	Low inverse correlation	0.3395
MSK patient care and admin	-0.3426	Low inverse correlation	0.151
Neuro patient care	0.4608	Low positive correlation	0.0471*
Neuro patient care and admin	0.3647	Low positive correlation	0.1247

**statistically significant*

instructions were provided for at least three minutes for each session. A low positive correlation on months of experience and treatment duration for patients with neurologic conditions (p=0.0471) was found (Table 4). Based on the results, total treatment times allocated to patients (45-55 minutes) is sufficient time to perform safe PT activities.

DISCUSSION

This study serves as pilot data on acute inpatient physical therapy in a developing country delivering evidence-based care for patients with neurologic and musculoskeletal conditions. The collected data is within the estimated 30-60 minute duration set across various PT clinics worldwide. This data is based on anecdotal evidence of the said settings, but not based on clinical research.

The interventions implemented for both conditions, stroke and arthroplasties, were based on existing guidelines set forth by the professional associations specific to diagnosis. All PT care provided were deemed safe as there were no adverse events and patient complaints noted during implementation. Both conditions may have multiple comorbidities that will result in multiple impairments including cognitive, and both interventions focus on functional mobility based on existing care guidelines. Available literature on clinical practice guidelines provided by developed countries such as Australia[8] and America[9] do not provide recommendations regarding the duration of treatment but only provide recommended strategies to address common problems of patients. Strong recommendations with level A evidence (Evidence from a meta-analysis of randomized controlled trials or consistent findings from two or more randomized controlled trials. Desirable effects clearly outweigh undesirable effects or undesirable effects clearly outweigh desirable effects.) that patients with stroke should be provided with tailored, repetitive tasks specific with task components practice. Similarly, patients with arthroplasties should have mobilization within 12-24 hours after surgery, focusing on functional mobility.[11-17] Therapy should include repetitive and intense use of patient-valued tasks that challenge the patient to acquire the necessary skills needed to perform functional tasks and activities (Evidence Level A).[13] It is notable that the provided interventions in our study have all the elements mentioned in the guidelines above. It was demonstrated across conditions that the majority (30-57%) of the time is spent on functional activities, aligned with existing evidence-based guidelines. In addition to this, the PTs have a dedicated time to provide patient and caregiver instructions to ensure continuity and safety of care, and realize the intended outcomes of the rehabilitation program.

According to the Commission on Higher Education, the PT curriculum is expected to have different and overlapping outcomes that an entry-level therapist must achieve to gain the competencies of a licensed physical therapist aligning to national and international standards).[18,19] The participants of this study are employed in the national university hospital where institutional mandates including leadership in patient care and service delivery, clinical education, and research-related initiatives are the pillars of their practice in accordance to the standards of PT practice.

The study conducted by Lau, Skinner, Lo, and Bearman in 2016 aimed to investigate the relationship between the duration of professional training (PT) and the months of experience in the context of work efficiency.[6] The research findings revealed a lack of established correlations between these variables. This intriguing outcome suggests that the connection between PT duration and experience in relation to work efficiency is complex and multifaceted. The absence of a clear relationship may be attributed to the presence of mitigating factors. Four key factors emerged as potential contributors to this phenomenon:

1. The work environment, encompassing elements such as workplace culture and available resources, could significantly influence work efficiency,[20] potentially overshadowing the impact of experience or PT duration.
2. Effective communication and healthy workplace relationships play a pivotal role in shaping collaboration and knowledge transfer, which in turn may mediate any direct link between experience and efficiency.[21]
3. Individual characteristics, labeled as person-related factors, can vary widely among employees, leading to divergent work efficiencies even among individuals with similar levels of experience.[23]
4. The sense of professional identity and the perceived role within an organization may modulate motivation and engagement, ultimately impacting work efficiency.[23]

In terms of the local context where the study was done, there are systems-level factors that may explain the findings. The organization's vision, mission and culture may affect work efficiencies of therapists.[24] In accordance to the organization's values, they may focus more on quality of care, without minding treatment duration. For other organizations, work efficiency may have been defined as clear treatment duration times of one hour per session that is linked with session payments. This may explain the study's local context wherein the hospital had an internal culture of one-hour treatment sessions across different clinics within their system.

In light of these intricate dynamics, further research is warranted to explore the interplay of these factors in diverse professional contexts, shedding light on the nuanced relationship between PT duration, experience, and work efficiency.[6,20-23] The study presents a significant opportunity for improving the delivery of physical therapy services, especially in countries where patient-therapist ratios are employed as a primary means of work scheduling. Standardized service delivery rates, as explored in this research, can serve as a fundamental benchmark for enhancing the consistency, efficiency, and quality of physical therapy care across diverse healthcare systems. Moreover, the study underscores the intricate web of factors influencing treatment session times, which is critical in setting appropriate service delivery rates. Patient complexity, therapist experience, treatment modalities, administrative tasks, and patient engagement all play roles in determining session durations. Striking the right balance between efficiency and quality is essential. While optimizing session times is important for healthcare system effectiveness, it should never compromise the quality of care delivered to patients. As such, any standardized rates must consider these nuanced factors to ensure that therapists have sufficient time to provide effective treatment tailored to each patient's unique needs.

Physical therapist staff are mandated to perform multiple roles which may entail work overload if different factors are not controlled.[25] We identified that disaggregating job tasks based on the time may be a strategy to facilitate better task delineation, following the tenets of the Job Demands-Resources Model which states that work features including time pressure may serve as resources that may fuel staff motivation if controlled properly.[25] Investigations also suggest that when workers are put under time pressure leading to increasing workload, they will experience difficulties in being mindful at work.[26] Proper time allocation as part of a practical and comprehensive job design therefore may provide opportunities to improve their mindfulness at work and opportunities to develop and pursue passion on roles which can fuel productivity in other roles as well. This is referred to as harmonious passion, that is an autonomous internalization that leads individuals to choose to engage in the activity that they like, highlighting that individuals who have harmonious passion perform better at work.[19,27,28]

Limitations

We have noted some limitations of our study such as patient outcomes, both clinical and their experience, were not assessed hence we cannot ascertain effectiveness of intervention. This is because random patients were selected for observations, but we reiterate that the interventions implemented were from evidence-based protocols and there were no noted adverse events and complaints during the study implementation. Another limitation may also be the decision on the representative diagnoses that were based on our division's census only and there could be variations in other contexts. Further, disruptions to PT care delivery may be patient-related factors such as procedures, adverse reactions requiring follow-up, effects of medications, and therapist-related factors, and our study have no noted disruptions during implementation hence the effects of disruptions to time were not detected. Moreover, bias may arise from Hawthorne effect on participants by the presence of external observers assessing timed performance of each participant. Despite this, the participants had been performing the same routines even before the conduct of this study which allowed them to exhibit their normal working patterns even with an external observer. An extensive orientation of the participants was conducted to discuss the purpose and procedures of the study. It was also emphasized that the external observer shall only record the time of each task without evaluation of the quality of the PT's performance. Furthermore, the PTs in the Philippines work closely with Rehabilitation Medicine specialists and the variation in the PT management duration may also be due to the recommended PT program and functional focus in the referral.

Recommendations

The researchers recommend a larger sample size with increased number of observations for each representative case. The process map of the initial clinical workflow may also be evaluated to result into a streamlined and relevant process reducing waste.

Table 5 summarizes specific clinic applications for a work schedule determining time allocation for physical therapists

Table 5. Proposed Work Schedule for a Physical Therapist with an 8-hour Shift

Time	Activity
Hours 1 and 2 00:00 – 02:00	Preparatory time: receiving of referrals, decking of patients, reading medical charts, preparing assessment and treatment equipment and apparel
Hours 3 to 7 02:00 – 7:00	Patient care time: bringing patients to ambulatory clinic, performing bedside rounds, assessing and managing inpatients, performing after care duties, having lunch break
Hour 8 7:00 – 8:00	Administrative time or time for other tasks: writing patient documents, charging patients, performing daily inventory, performing tasks related to other roles of a physical therapist

working on a regular 8-hour shift in a tertiary teaching hospital. The results showed that the mean patient care time of around 47 minutes resulted in identifying that there can be a maximum of 10 patients to be decked to each physical therapist daily. We have determined that by subtracting the time for administrative duties of around 20 minutes, an arbitrary buffer time accounting for disruptions, and the time for performing tasks in different roles and special interests, a maximum of eight patients may be allocated to each physical therapist daily with specific timing recommendations. This shall allow the staff to practice flexibility with more efficiency and productivity on a daily basis.

Future research may focus on improving worker efficiency by including the route taken for every service provided, identification of patient-facing activities and non-patient facing activities, staff down time, identification of value-adding and non-value adding activities for each treatment, service-blueprinting for common service errors, and process mapping of each type of service provision. Further inquiry on initial physical therapy assessments, interprofessional communications and other variabilities induced by a physical therapist's nature of work may also be beneficial.

CONCLUSIONS

For service, training, and research, the delineation and determination of appropriate duration of tasks may improve work productivity and the current data may help in the optimization of resources for better service delivery and of course the determination of task duration aids in the prevention of demand overload and overexertion of the employees.

Our study attempted to quantify the duration of PT care in an inpatient setting that caters to patients with different diagnosis and varying needs for PT management. The durations of tasks were defined and may serve as basis on optimal patient decking on PTs for safe and evidence-based service delivery, while ensuring ample time to be allocated to tasks outside patient care that are also vital to achieve institutional and professional goals.

Implications

Our pilot time and motion study can contribute to the limited evidence of duration of inpatient care that may inform human resource allocation, deliverables prioritization, and employee wellness and professional development. Figures have been presented which could be the basis for future policy research for task times, reimbursements, management science, and resource allocation studies.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

All authors declared no conflicts of interest.

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