

Assessment of Facilities Key Performance Indicator (KPI) of Physiotherapy Spaces Toward the Stroke Patients' Recovery in Putrajaya Hospital

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Abstract: Key Performance Indicators (KPI) are the best tool to achieve organizational goals because KPI lets people gather knowledge. Performance measures the quality of treatment and effectiveness of various services in the healthcare sector in order to decrease costs and provide value to the patient. The stroke recovery process involves a variety of involvement that is related to stroke to ensure the stroke patients' recovery has improved over time. Therefore, recognizing what stroke patients have improved in their recovery while using the facilities in physiotherapy space is significant to associate with facilities KPI. The purpose of this study is to identify the facilities KPI of physiotherapy spaces in the healthcare sector and to assess facilities KPI physiotherapy spaces with stroke patients' recovery. The researcher gather data through an interview with a healthcare professional. The study discovered the facilities key performance indicator (KPI) of physiotherapy spaces in healthcare sector and assessment of facilities KPI physiotherapy spaces with stroke patients' recovery. The data was then used to highlight the link between the facility's KPI and the recovery of stroke patients.

Keywords: Facilities Management, Key Performance Indicator (KPI), Physiotherapy, Stroke Recovery

1. Introduction

According to Rahman *et al.*, (2019) performance is reaching business goals and keeping the quality well-being of patients in healthcare. Furthermore, the Key Performance Indicator (KPIs) is a strategy tool that can be used to measure the success of performance facilities at hospitals. The healthcare sector could reach a good achievement by developing the KPIs by doing the right observation to monitor, measure, and manage the healthcare system. By doing a depth in analysing KPI, it can help facility managers to alert the effect on observation while monitoring in order to improve the performance of facilities management. The systematic process will lead to a good observation so that it would not happen as unwanted things such as wasting in providing the cost to improve performance facilities.

Physiotherapy is all about aid to rehabilitate movement and function as well as when someone is affected by injury, illness, or disability. Also, it is usually related with continuous treatment to get into a recovery phase. Next, (Alphonsus *et al.*, 2019) state that education, consultation, therapeutic exercise, and cardio respiratory technique which all of these are conducted in physiotherapy by physiotherapist toward patients. Physiotherapists are offering to help patients of all ages in terms of how to manage their pain and also prevent the disease from becoming worse.

Stroke disease is known as one of the diseases that lead towards the cause of death among adults worldwide. This kind of disease could attack someone suddenly without knowing that their body is not in a healthy state. According to (Kim *et al.*, 2021), the incidence and prevalence of stroke are increasing continuously worldwide because of aging populations. Again, it means that the senior citizen who is 60 years and above have a higher risk than those younger to get exposure to the stroke. Hence, stroke patients require specific treatment according to the type of stroke that they experience. Indeed, it is important to observe the stroke patients' recovery to follow up on the stroke patients' condition.

Stroke patients require the proper treatment for their kind of stroke, respectively. To gain a good recovery, stroke patients must get stroke rehabilitation. The facilities used for rehab should be determined whether it helps in recovery with all the facilities that have been provided. Stroke recovery is a complex and long process because this process requires patience, total commitment, and access to numerous facilities and specific equipment (Lupu *et al.*, 2018). Since it has a long recovery process, it is vital to focus on how the facilities have been provided and improve the stroke patients' recovery.

Granted to identify which of the facilities could positively impact the stroke patients' recovery, the key performance indicator (KPI) would help determine how credible the facilities in the physiotherapy space are. According to (Lai, 2020) it is crucial to properly manage the facilities in hospital buildings to get adequate performance for a better operation of facilities toward the user (patient). Next, the importance of identifying the KPI of physiotherapy in the healthcare sector is to find out which of the facilities are helping stroke patients' recovery and also, to help out for a better improvement of facilities if there are facilities that do not give effective results toward stroke patients.

Every stroke patient has a difference of improvement for their stroke recovery due to the human body's capabilities and, based on the variance type of stroke. Therefore, recognizing what stroke patients have improved in their recovery while using the facilities in physiotherapy space is significant to associate with facilities KPI. Stroke patients might have fast or slow recovery because of the conditioning environment in physiotherapy. Therefore, we enable to point out how important it is to do research in providing service or operational facilities that may contribute to stroke recovery.

2. Literature Review

The Key Performance Indicator (KPI) is helping in identifying the accurate and applicable information by using a depth-analysis, systematic process, and diagnosis the proper technique to achieve the excellent performance of the organization (Rathnayaka *et al.*, 2015). Besides, the KPI could indicate the effectiveness and efficiency and quality of expertise and product when it assists facility managers in comparing the actual and estimated performance so that the past issue will be overcome. It shows that every organization is capable of reaching success to meet its objective the organization.

Also, it takes a specific time to understand the essential issue facing before it could go further in performance organization by using the KPI.

According to Amaratunga *et al.*, (2000), various activities are involved in facilities management (FM) to ensure all the services of management that carry the core business of the organization are effective management. Therefore, FM is essential since it could cut overhead costs in spending for facilities and building, giving the user satisfaction because the organization is efficient in space management and other related assets for daily use. Moreover, the combination of efficiency, cost, and quality important as these three aspects might lead to the growth of organization among people.

The various physical methods, for instance, physical activity, exercise, movement, relaxation techniques, and body and movement awareness, are provided by physiotherapy, also known as a standard profession in healthcare (Probst, 2017). In addition, physiotherapy is helping to prevent physical disability at an early stage if early physiotherapy involves such as mobilization and stimulation of activities. Therefore, physiotherapy approaches are for symptom relief, the enhancement of self-confidence, and the development of quality of life (QOL) since it assists patients from the critical stage to the rehabilitation stage, which would impact someone's emotions.

Stroke or known as cerebrovascular accident (CVA) or, in another word is a brain attack. Next, stroke can occur when the blood is interrupted or reduced when the blood supply to your brain. Thus, death can happen at any minute if the brain cell could not get enough oxygen and nutrients. Aging populations commonly suffer from the incidence and prevalence of stroke (Kim *et al.*, 2021). By 2030 the estimation for stroke can be three times from the current rate. Since the senior citizen is easily exposed to various diseases such as diabetes, hypertension, high cholesterol, and much more, the common disease can lead to stroke. The factors enable risk for those who are having high blood pressure, diabetes, heart disease, smoking, family history of stroke, age, race, and ethnicity. However, the drinkers and illegal drug use high cholesterol, unhealthy diet, obesity, and not having enough physical activity enable a higher risk of stroke.

2.1 Facilities KPI of the Physiotherapy Spaces

(a) Inpatient Utilization

The purpose of an inpatient is to improve the health status of someone who needs observation by a healthcare professional. The inpatient utilization indicator measure by KPI is to identify whether the admission that is acquired to the hospital is helping the patient needs medical services. For instance, the number of admissions and discharges needs to be documented as well as the number of inpatient days, how many beds were used a day, the average length of stay, and the number of hospital beds related to the operation's effectiveness of the hospital. The measurement of bed occupancy rate is associated with length of stay (LOS) plays an essential role in measuring how useful it is in guiding the planning and operational management of healthcare. Thus, much bed occupancy affects how well patients are treated due to the comfort that patients perceive when using facilities.

(b) Environmental Conditions

The productivity, comfort, and health of someone are influenced by the physical environmental factors, which are lighting, sound/noise, colour suitability, and air quality for better performance while conducting patients (Mahmoud *et al.*, 2015). To reduce pain, anxiety, and stress for patients, it is essential to get to know the physical environment that helps in the improvement of patient recovery.

(c) Accident/injury

Accidents or injuries could happen anywhere, and it consists in terms of safety. The safety of patients is a parameter that plays an essential role in reflecting the quality of the healthcare sector (Khalifa & Khalid, 2015). Subsequently, the equipment at physiotherapy breakdown can measure and create the new aim to improve by reducing the number of it by (Ordonez, 2021). Thus, equipment breakdown can be endangering the lives of users (patient) and production as well.

(d) Equipment Related

Equipment within physiotherapy treatment is to recover motor capabilities of post-stroke when the physical rehabilitation training is related (Postolache *et al.*, 2016). Rehabilitation stroke is a slow, painful and costly process that requires high motivation in terms of physical and mental. Therefore, equipment related to physiotherapies such as chiropractic tables, pedal exercise, arm tutor, traction table, exercise balls, hand therapy, and many more required in good care so that patients have the opportunity to use it comfortably and for a long duration.

(e) Task-Related

A duty or chore done for a specific work is meaning of task-related. In this case, tasks related to physiotherapy treatment of stroke patients involve three parties; the patients, caregiver or known family member, and physiotherapist who are working together for stroke patients' recovery during the rehabilitation phase (Demir *et al.*, 2015). Next in physiotherapy, the work request-response rate comes from healthcare professionals because their priority of stroke patients is mainly to body function and body structure as they can move arm and leg on the affected side.

2.2 Physiotherapy of Healthcare Professional Performance

A physiotherapist is a healthcare professional who will guide patients to regain their strength and movement and prevent further problems in the future. Additionally, they assist people to recover from injuries sustained that effect from surgery, illness, aging, or disability. According to Brennan (2020), a doctor will have referred a patient with a disease or injury that impacted the patient's ability to carry out daily routine to the physiotherapist to assist the patient in managing pain, balance, mobility, and motor function.

According to Health Times (2021), other than evaluating a patient's physical condition to diagnose problems and start to execute a treatment plan, a therapist also educates patients, their families, and the community. Education is one of the essential roles of physiotherapists to prevent injuries, and it is important as the physiotherapy process will interrupt patients' emotional, psychological, and social well-being.

2.3 Type of Stroke

(a) Ischemic Stroke

Brain ischemia or cerebral ischemia has approximately 87 percent of all strokes. According to American Heart Association (AHA), when a vessel supplying blood to the brain is obstructed, the situation is called Ischemic Stroke (IS). The blood clotting happened due to atherosclerosis, or it was caused by the fatty deposits lining the vessel walls. Whenever the blockage occurs in an artery that supposes blood to the brain, it would reduce blood flow and lack of oxygen uptake in the brain (Hersh, 2018); this kind of situation might lead to damage and death of the brain cells. The brain damage can be permanent if the circulation of blood is not restored quickly.

A transient ischemic attack (TIA) is also known as a mini-stroke because this stroke lasts only a few minutes. TIA occurs when blood supply to part of the brain is briefly interrupted, it also can be said that the brain experiences a temporary lack of blood flow.

(b) Hemorrhagic Stroke

Hemorrhagic stroke is the sudden bleeding (hemorrhage) that interferes with the brain's function. Hence, according to Harvard Health Publishing (2019), either within the brain or between the brain and the skull is where the location of bleeding can occur. About 13 percent of stroke cases regarding hemorrhagic are caused by a weakened vessel that ruptures and bleeds into the surrounding brain.

There are two types of hemorrhagic strokes: Intracerebral haemorrhage (ICH), broken blood vessel that occurs within the brain could cause bleeding. For a rare case, ICH may happen due to leaking an abnormal and weak-willed blood vessel that connects between an artery and vein. Next, Subarachnoid hemorrhage (SAH) is the accumulation of blood at the surface brain that has been caused by the bleeding from a damaged blood vessel.

2.4 Stroke Patients' Recovery

After someone has diagnosed a stroke, they will receive treatment for the stroke recovery phase. Everyone will have a different recovery time, and some people will recover fully while others have a long-term disability. It could take weeks, months, or years depending on how severe the stroke condition is and the level of endurance of someone's body during the recovery process. Usually, a team-based approach for stroke rehabilitation, such as physical therapy, occupational therapy, and speech and language therapy, requires various disciplines for better outcomes (Belagaje, 2017). Thus, setting up goals daily and making adjustments to the rehab are the roles of why a team is involved.

(a) Speech and Language Therapy

A speech therapist is handling patients who experience communication problems and speech disorders. It is performed by speech-language pathologists (SLPs). This therapy aims for improving communication for those required because of speech disorders during childhood or caused by stroke or brain injury that led to speech impairment among adults (Longhurst, 2019). Either for adults or children, SLP will assess the patient at the beginning of the therapy session to recognize the type of communication disorder and the best method to treat because everyone has different problems and abilities.

(b) Physical Therapy

Physical therapy focuses on improving the patients' mobility or the ability to move their body part. It aims to reduce the pain and help in function to move and live better. Next is stroke rehabilitation to increase muscle flexibility as well as a higher level of muscular strength and endurance. According to Stephenson (2019), physical therapy benefits after stroke physical rehab, which improves overall stability and mobility.

The number of physical therapy sessions is based on the patient's condition because not everyone has the exact needs or goals to achieve (Brakeville, 2019). To make patients feel better, physical therapists will work together to know more details regarding personal goals, suitable exercise, and the type of treatment that will improve the recovery. Some conditions need physical therapy, such as difficulties in grip or holding items, difficulty in raising hands, inability to walk well and affect part or all sides of one side of the body, such as one side of the face, arm, or leg.

(c) Occupational Therapy

Occupational therapy is the ability to perform daily activities is that occupational therapy focuses on it. Hence, according to the Massachusetts College of Pharmacy and Health Science (MCPHS), occupational therapy also constructs mental healthcare and physical rehabilitation. The therapist will help the patient adapt, modify, or change daily activities that a person is required or willing to do. According to (Minkow, 2014) occupational therapy will help improve stroke patients' ability from their daily tasks. Day-to-day tasks can be called Activities of Daily Living, for example, bathing, dressing, eating, driving, and other essential things people would do.

3. Research Methodology

This research uses a qualitative approach through interviews for gathering the information regarding facilities KPI of physiotherapy toward the stroke patients' recovery. Moreover, it is a process of data collection by a researcher orally with respondent between two ways of communication.

A respondent is someone who is in charge of the physiotherapy spaces and conducts performance in the physiotherapy unit at Putrajaya Hospital between the facilities and stroke patients. In addition, the researcher will obtain information from the physiotherapy medical rehabilitation officer, who is the director of the physiotherapy unit.

The beginning of the first stage will be identifying the research problem and issue that suitable and relevant. Thus, the research questions, objectives, and research scope will recognize to begin the research. A second stage, construct a literature review that suitable for research study and gathering information. Last but not least, at the third stage, this will be analysis data that has been collected for and the recommendation also conclusion for the whole research studies.

This research is conducted at Putrajaya Hospital because more equipment for physiotherapy treatment is available than in other physiotherapy unit. Moreover, the physiotherapy profession is committed to giving quality service and easy to obtain by every stratum of society advancement of knowledge, skills and the use of high-tech treatment methods meet the needs of the patient and be able to contribute towards quality improvement life.

3.1 Data Collection

The facilities KPI is selected according to the suitability of physiotherapy from the reading result from the previous research study. To achieve first objective, the researcher will use interviews as a method with the healthcare professional of the physiotherapy. The achievement that a researcher can obtain is toward the first objective is a description of the effectiveness of facilities KPI of physiotherapy spaces.

The second objective in this research study is to assess facilities KPI physiotherapy spaces with stroke patients' recovery. To achieve the second objective, the researcher will use interviews as a method with healthcare professionals who treats stroke patients for recovery. This is to get know their opinion on facilities KPI to the stroke patients' recovery. Therefore, to acknowledge of what kind of recovery that stoke patient could improve from facilities.

3.2 Data Analysis

For this research, the interview method is being used entirely. Moreover, to analyse the received data from the interviews, the researcher will make transcripts of interviews conducted and analyse them through content analysis. The formal language or academic language will use, but it will not change the meaning from the conducted of interviews as for transcript.

In qualitative data, content is used as an analysis method that usually applied in the interview transcripts. Since semi-structured interviews used, content analysis is relevant in a technique for data analysis. Moreover, it is a flexible method and strives in identifying patterns of themes in interview data.

4. Results and Discussion

A description of the respondent's background for both objectives. The first objective is to identify the facilities key performance indicator (KPI) of physiotherapy spaces in the healthcare sector and the second objective is to access facilities KPI physiotherapy spaces with stroke patients' recovery. All these two objectives were interview by the same individual in order to meet the precise two objectives of research study. A respondent able to meet these two objectives due of it occur in physiotherapy and a respondent is a person responsible for the operations of the unit.

The respondent was born in Batu Pahat, Johor, and is a graduate of Universiti Kebangsaan Malaysia, where he studied degree program (UKM). He continued his education by pursuing a Master's degree in physiotherapy. Besides, he has started his career and has experience in the field of physiotherapy for 12 years.

Following that, he began working in the area of physiotherapy in the physiotherapy unit of Melaka Hospital in 2009, where he remained till 2017. He then continued his career in the field of physiotherapy at the Raja Perempuan Zainab II Hospital in Kota Bharu, where he would remain until the end of May 2021. Later, he was assigned as the Head of the Physiotherapy Unit at the Putrajaya Hospital, where he held the position of Physiotherapy Medical Rehabilitation Officer Grade U48.

There are several awards he has received such as Best Oral Presenter during the 5th MOH Physiotherapy Conference in 2019 and the Global Health Science Conference in 2020. Then, There are several first prize awards for the technology Innovation program in 2019 he has received. Besides, he has published several papers namely Effect of Therapy-based Virtual Reality on Walking Endurance and Quality of Life of Persons with Knee Osteoarthritis in 2019 and Virtual Reality Therapy in the Management of Knee Osteoarthritis in 2020.

4.1 Finding of Objective One

(a) Service

To attain a good KPI for physiotherapy unit, respondent and the team will have done a joint inspection that will take place for once a week. The physiotherapy unit has a schedule and it will patrol alongside the supervisor in charge of the area. Subsequently, each area has its own supervisor which is physiotherapy professional in charge and patrol will be done to monitor the state of the situation for the five services or aspects.

(b) Physiotherapy space

In order to keep best performance and quality of physiotherapy unit, another KPI was set where is “one day for one report” and this complaining come from the physiotherapy medical staff. This if for preventing cases of negligence on the part of the physiotherapist when handling the patient to receive treatment especially treatment involving related equipment of physiotherapy.



Figure 1: Main gymnasium

(c) Converting to functional spaces

Besides, lack of space them the idea on the converting to functional spaces for unused spaces as a treatment room. Thus, this shows that good and creative use of spaces can be implemented to save

cost and time. However, these cost and time reductions cannot be guaranteed to have a positive impact on the overall quality of the space, as it may make the space less functional in the future.

(d) Space division

Following that, initiatives in space division were implemented in order to improve the comfort and specificity of space functionality for patients with stroke. This divide of space is performed for acute stroke and advance stroke, and it is done in order to boost the relevance of physiotherapy space in the hospital even more.



Figure 2: Acute stroke and advance stroke gymnasium

(e) Accident

A Root Cause Analysis (RCA) assessment would be conducted Putrajaya Hospital has made an initiative to improve this accident management to investigate and find the cause of this accident. This RCA is implemented in every unit including the physiotherapy unit. next, an analysis will be issued for the action of the parties involved to take the next step to resolve the issue of the accident that occurred. If a patient is injured accidentally while receiving physiotherapy treatment, an RCA member from the physiotherapy unit will conduct an investigation and then convene a meeting with representatives from the rehabilitation department's three units: speech therapy, physical therapy, and occupational therapy. Each member of staff who is responsible for RCA will get training on this specific job function.

(f) Maintenance

Putrajaya Hospital's Plan Preventive Maintenance (PPM) schedule is a timetable that a sub-company of facilities management for the hospital uses to perform maintenance on the equipment in the physiotherapy unit here. The maintenance schedule is organized according to the type of equipment or asset being maintained. This is due to the fact that each and every piece of medical care equipment has a variety of varieties based on its usefulness and frequency of use.

(g) Lighting and flooring management

Lighting and flooring management can be ensuring by adhere by the appropriate standards of usage for this reason, failure to adhere to established standards can put users, such as patients and employees, at risk of injury or even death. For example, the use of the floor must be rough in order to prevent slipping and falling. Meanwhile, lighting is essential, it is also important that it is not excessively dim or too bright for the user's comfort.

4.2 Finding of Objective Two

(a) Facilities strategy

Among the specialised medical equipment utilised by stroke patients in the physiotherapy unit are medical electric rehabilitation bobath beds, standing frames, bicycles, and paddle bars. Subsequently, the provision of rehabilitative care equipment in large quantities capable of accommodating a large number of patients at one time.

(b) Improvement facility

Hydrotherapy is a kind of water therapy consists of performing exercises and particular physiotherapy procedures while submerged in warm water. The goal is to reduce pain while also relaxing and strengthening muscles while increasing circulation and, as a result, improving function. Adults and children with restricted mobility can also benefit from hydrotherapy since it allows them to move about more freely in the water.

(c) Physiotherapy's skill

Apart from the equipment that aids the recovery of these stroke patients, trained and skilled of physiotherapy also help them. Physiotherapy unit will hold refreshing course such as give the physiotherapist training or courses. In order to give the training to physiotherapist, they target for twice a year regarding of budget had been provide to physiotherapy's fund. Besides, they will ask the instructor or any academicians to come over the hospital and they will invite other nearest hospital to having lecturer together such as Serdang Hospital, Kajang Hospital and Ampang Hospital.

(d) Family support

Family support is essential for stroke patients, particularly during the rehabilitation phase. Patients want encouragement and moral support in order to remain motivated and ready to continue their recovery as normal. This is due to the fact that stroke rehabilitation therapy takes a long time, and it is important to be the patient's core in order to aid them through the process both mentally and physically.

(e) Early rehabilitation treatment

When treating stroke patients in the hospital, it is important to remember that it is only a light and uncomplicated rehabilitation treatment that is carried out under the supervision of physiotherapists at the beginning of the process. Typically, this early rehabilitation treatment is carried out only in bed or in the immediate vicinity of the ward. Finger movements, finger and hand stretching, and hand grip strength are just a few examples of early therapy for this type of rehabilitation

(f) Systematic patient treatment scheduling

Systematic patient treatment scheduling gives patients time to perform rehabilitation according to the patient's endurance capacity. This is due to the fact that the patient will receive rehabilitation treatment according to the appointment schedule established by the treating physiotherapist and will be able to complete rehabilitation at home if he or she is able to do so.

(g) Division of staff on duty

This division of duty staff is necessary in order to avoid employees from becoming overtired and unable to function properly. This is due to the fact that adult rehabilitation treatment takes 45 to 60 minutes per patient, requiring a tremendous amount of energy from the staff. In addition, one-on-one treatment between physiotherapists and stroke patients is required for unstable stroke patient. Every six months, a divide is made between the personnel and the pediatric rehabilitation therapy program. This is due to the fact that the children's rehabilitation section requires less energy to treat with.

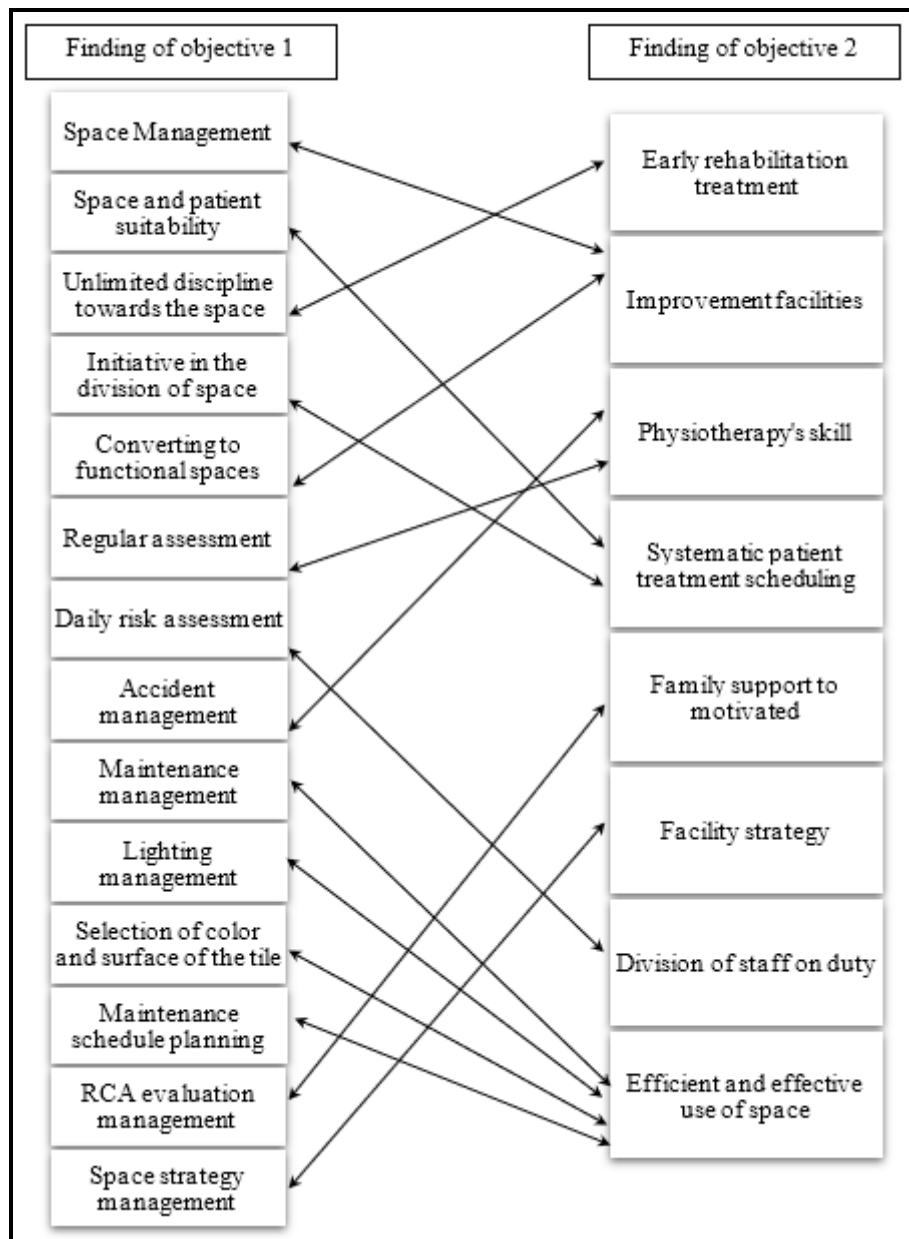


Figure 3: The relationship finding of objective one and two

It shows the relationship in between the finding of objective one and finding objective two. The KPIs obtained by the use of information gathered through interviews with respondent. As a result, a relationship is formed that has the potential to further improve the performance of an organization. moreover, these KPIs are the driving force to an organization and can provide good value to users (patients) also facilitate the staff of the physiotherapy unit.

5. Conclusion

Based on studies that have been conducted in detail, these two objectives have been set by the researcher which are to identify facilities Key Performance Indicator (KPI) of physiotherapy spaces in the healthcare sector. This is to find how the facilities can be related to stroke patients' recovery. For first objective that has mentioned, the KPI for facilities quite help operation in physiotherapy spaces in due of many KPI are set for the operation of facility. Next, the findings of data and information from the interviews conducted, the researcher is able to study the information regarding to assess facilities

KPI physiotherapy spaces with stroke patients' recovery. The facilities KPI taken for the recovery period of stroke patients can be studied that space plays an important role in loading the number of patients for treatment at one time

It is not just the facilities and accompanying equipment that will aid in the recovery of a stroke patient; rather, it is the abilities of the physiotherapist that should be taken into consideration because, without them, no one will be able to assist and lead the patient. The job of the physiotherapist is quite significant in the enhancement of rehabilitation. Essentially, facilities KPI in physiotherapy spaces and physiotherapists must work together in order to provide the greatest possible outcome and consistent performance levels.

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References

- Alphonsus, K. B., Su, Y., & Arcy, C. D. (2019). Complementary Therapies in Medicine The effect of exercise, yoga and physiotherapy on the quality of life of people with multiple sclerosis: Systematic review and meta-analysis. *Complementary Therapies in Medicine*, 43(February), 188–195. <https://doi.org/10.1016/j.ctim.2019.02.010>
- Amaratunga, D., Baldry, D., & Sarshar, M. (2000). Assessment of facilities management performance – what next? *Facilities*, 18(December), 66–75. <https://doi.org/10.1108/02632770010312187>
- Belagaje, S. R., & MD. (2017). *Stroke Rehabilitation*. February, 238–253.
- Brakeville, R. (2019, July 27). *Physical Therapy Exercises, Manual Therapy, Hydrotherapy. How It Works*. What Is Physical Therapy? <https://www.webmd.com/pain-management/what-is-physical-therapy>.
- Brennan, D. (2020, December 15). *What Is a Physiotherapist? What They Do, When to See One, and What to Expect*. What Is a Physiotherapist? <https://www.webmd.com/a-to-z-guides/what-is-a-physiotherapist>.
- Demir, Y. P., Balci, N. Ç., Ünlüer, N. Ö., Uluğ, N., Dogru, E., Kiliç, M., Yildirim, S. A., & Yilmaz, Ö. (2015). Three different points of view in stroke rehabilitation: Patient, caregiver, and physiotherapist. *Topics in Stroke Rehabilitation*, 22(5), 377–385. <https://doi.org/10.1179/1074935714Z.0000000042>
- Hammarberg, K., Kirkman, M., & De Lacey, S. (2016). Qualitative research methods: When to use them and how to judge them. *Human Reproduction*, 31(3), 498–501. <https://doi.org/10.1093/humrep/dev334>
- Hemorrhagic Stroke. Harvard Health. (2019, February 13). https://www.health.harvard.edu/a_to_z/hemorrhagic-stroke-a-to-z.
- Ischemic Strokes (Clots). www.stroke.org. (n.d.). <https://www.stroke.org/en/about-stroke/types-of-stroke/ischemic-stroke-clots>.
- Khalifa, M., & Khalid, P. (2015). Developing strategic health care key performance indicators: A case study on a tertiary care hospital. *Procedia Computer Science*, 63(Ict), 459–466. <https://doi.org/10.1016/j.procs.2015.08.368>
- Kim, S. R., Kim, S., Cho, B., Yu, S., & Cho, K. (2021). Influence of Type D Personality on Health Promoting Behaviours and Quality of Life in Stroke Patients: A Cross-Sectional Study in South Korea. *Journal of Stroke and Cerebrovascular Diseases*, 30(5), 105721. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2021.105721>
- Lai, J. (2020). *Identification, classification and shortlisting of performance indicators for hospital facilities management*. 39(1), 4–18. <https://doi.org/10.1108/F-08-2019-0092>
- Lupu, R. G., Irimia, D. C., Ungureanu, F., Poboroniuc, M. S., & Moldoveanu, A. (2018). BCI and FES based therapy for stroke rehabilitation using VR facilities. *Wireless Communications and Mobile Computing*, 2018. <https://doi.org/10.1155/2018/4798359>
- Mahmoud, A. S., Sanni-anibire, M. O., Hassanain, M. A., & Ahmed, W. (2015). *Key performance indicators for the evaluation of academic and research laboratory facilities*. <https://doi.org/10.1108/IJBPA-08-2018-0066>
- Minkow, D., LA, L., SR, L., OJ, S.-R., A, D., & P, L. (2017, July 31). *Occupational therapy for stroke: what is it and how can it help?* Evidently Cochrane. <https://www.evidentlycochrane.net/occupational-therapy-stroke-can-help/>.
- Ordenes, P. (2021, March 6). Health & Safety KPI Examples - The 12 Key Metrics to Track. <https://www.cascade.app/blog/kpis-health-and-safety>.
- Postolache, O., Cary, F., Girao, P. S., & Duarte, N. (2016). Physiotherapy assessment based on Kinect and mobile APPs. *IISA 2015 - 6th International Conference on Information, Intelligence, Systems and Applications*. <https://doi.org/10.1109/IISA.2015.7388013>

- Probst, M. (2017). Physiotherapy and Mental Health. In *Clinical Physical Therapy*.
- Rahman, M. H., Tumpa, T. J., Ali, S. M., & Paul, S. K. (2019). A grey approach to predicting healthcare performance. *Measurement: Journal of the International Measurement Confederation*, 134, 307–325. <https://doi.org/10.1016/j.measurement.2018.10.055>
- Rathnayaka, R. M. K. T., Seneviratna, D. M. K. N., & Jianguo, W. (2015). Grey Systems: Theory and Application Article information: *Grey Systems: Theory and Application*, 5(2), 178–193.
- Stephenson, B. (2021, May 3). *How Physical Therapy Helps Stroke Patients*. Short- & Long-Term Rehab Blog. <https://blog.rehabselect.net/how-physical-therapy-helps-stroke-patients>.