**Journal of Community Engagement in Health**
https://jceh.org/ https://doi.org/10.30994/jceh.v8i1.616
ISSN: 2620-3758 (print); 2620-3766 (online) Vol. 8 No 1. March 2025. Page. 112 - 119

# Effort Improvement Range of Motion (ROM), Overcoming Pain, and Repairing Balance in Cases Musculoskeletal Low Back Pain (LBP) with Hydrotherapy at Dr. M. Goenawan Partowidigdo Pulmonary Hospital

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## ABSTRACT
Low back pain (LBP) is one problem frequent musculoskeletal happens in society. One of symptom main of LBP is decline range of motion (ROM) in the lumbar area. This decrease in ROM can cause limitations in activity daily patient, influence quality life they in a way overall. Fishbone diagram is used to identify various factor reason from problems faced. This diagram share internal causes categories like man, methods, machines, materials, measurements, and environment. The USG method (Urgency, Seriousness, Growth) is used to determine priority problem based on urgency, seriousness, and growth existing problems. SWOT analysis is used to evaluate existing strengths, weaknesses, opportunities and threats in context intervention hydrotherapy for LBP patients. Hydrotherapy proven effective in increase ROM and reduce pain in LBP patients at Dr. M. Goenawan Partowidigdo Pulmonary Hospital. With exists proper education and adequate facilities are expected patient can overcome their LBP complaints and improve their quality life.

**Keywords:** balance, hydrotherapy, LBP, pain**,** ROM

Received: January 8, 2025
Revised: February 11, 2025
Accepted: March 28, 2025



## INTRODUCTION

Low back pain (LBP) is one of them problem frequent musculoskeletal happens in society. According to data from the World Health Organization (WHO), the prevalence of LBP in the world reaches 60-70 % population (Hoy et al., 2012). In Indonesia, the prevalence of LBP is reported reaching 7.6% of the total population (Indonesian Ministry of Health, 2013). Condition This impact significant impact on quality life sufferers, productivity work, as well give burden great economy for individual and system health (Dagenais, Caro, & Haldeman, 2008). One of symptom main of LBP is decline range of motion (ROM) in the lumbar area. This decrease in (ROM) can cause limitations in activity daily patient, influence quality life they in a way overall.

Reason main of LBP are often associated with disruption to the structure musculoskeletal, such as muscles, ligaments, or joints. This matter can cause spasm muscle tone, inflammation, and decline flexibility joints, which in the end reduces ROM (Krismer & van Tulder, 2007; Airaksinen et al., 2006). Besides that, other factors such as posture bad body, activity physical overload, and stress can also be contributing to occurrence of LBP (Krismer & van Tulder, 2007).

Range Of Motion (ROM) are size how much far and how much lots a joint can move in various direction. In the case of LBP, the lumbar range of motion (ROM) decreases can happen consequence exists pain, spasm muscle, or limitations motion joints (Kisner & Colby, 2012). This decrease in range of motion (ROM) can bother activity functional sufferers and impact on quality his life. Hydrotherapy is one possible therapeutic modalities used to overcome LBP problem. A number of studies show that hydrotherapy can increase ROM in patients with LBP. A study by Rahmann et al. (2009) report that LBP patients undergoing a hydrotherapy program during four Sunday experience increase in ROM by 10-15%. Another study by Dundar et al. (2009) also shows results similar, where LBP patients get hydrotherapy during three Sunday experience increase in ROM by 12%.

Hydrotherapy utilizes traits unique water, like Power buoyancy, viscosity, and temperature, to help repair function musculoskeletal. Hydrotherapy can increase ROM, reduce pain, and repair function in patients with LBP. However, understanding about mechanism Work hydrotherapy and its effectiveness in increase ROM in LBP cases still limited.

Prevalence disturbance musculoskeletal in poly physiotherapy at Dr. M. Goenawan Partowidigdo Pulmonary Hospital reached 58.2%, with more prevalence higher in women (97.3%) compared men (2.7%). Most of the patient are in a group aged 50-70 years (99%), with LBP (40%) and osteoarthritis (OA) genu (20%) being complaint general. Therefore That's important to explore intervention hydrotherapy as solutions to improve ROM and overcome pain in LBP patients at Dr. M. Goenawan Partowidigdo Pulmonary Hospital.

## METHODS

The *fishbone diagram* was applied to explore the root causes of LBP-related issues. This tool helped categorize the potential factors affecting patients into six main groups: man (patients and staff), methods (treatment protocols), machines (hydrotherapy equipment), materials (therapeutic resources), measurements (assessment tools like pain scales and range of motion devices), and environment (hospital settings). By visually mapping these factors, the team identified the complex interactions that contribute to reduced range of motion and persistent pain.

Next, to prioritize which issues needed the most urgent attention, the *USG method* was used. Each identified problem was evaluated based on its urgency, seriousness, and potential to worsen over time. This allowed the team to focus on critical challenges that could most impact patient recovery, ensuring that resources were targeted effectively.

Finally, a *SWOT analysis* was carried out to assess the hospital's capacity to provide effective hydrotherapy treatment. This involved examining internal strengths such as experienced staff and existing equipment, as well as weaknesses like limited patient education or facility constraints. External opportunities, like growing awareness of hydrotherapy benefits, and threats, including possible budget limitations, were also considered. This comprehensive analysis informed the design of interventions aimed at improving patient outcomes through hydrotherapy.

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## RESULTS

Figure 1. Fish bones

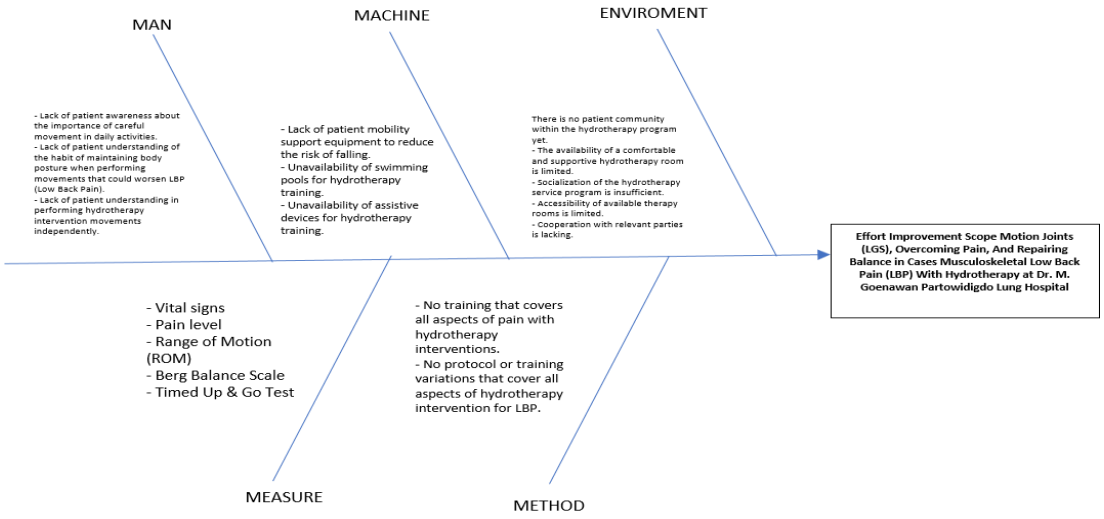


**Table 1.** USG

| No | Indicator | U | S | G | UxSxG | Ranking |
|---|---|---|---|---|---|---|
| 1 | Lack awareness patient will caution do movement activity a day. | 5 | 5 | 5 | 125 | 1 |
| 2 | Lack understanding patient in habit guard posture body that can worsen LBP. | 5 | 5 | 5 | 125 | 2 |
| 3 | Lack understanding patient in do movement intervention hydrotherapy independent | 3 | 2 | 4 | 24 | 4 |
| 4 | Unavailability pool swimming for practice in hydrotherapy. . | 1 | 3 | 4 | 12 | 6 |
| 5 | Unavailability tool help with practice in hydrotherapy | 1 | 3 | 4 | 12 | 7 |
| 6 | There isn't any yet protocol variation exercise covers all over aspect intervention hydrotherapy | 2 | 4 | 3 | 24 | 5 |
| 7 | There isn't any yet community patient in a hydrotherapy program. | 4 | 4 | 2 | 32 | 3 |
| 8 | Not yet available room Comfortable and supportive hydrotherapy. | 2 | 2 | 3 | 12 | 8 |
| 9 | Noise or other disturbances during therapy session because in the pool swimming general. | 3 | 1 | 1 | 3 | 10 |
| 10 | Accessibility therapy locations that require collaboration with other party or rent | 4 | 1 | 1 | 4 | 9 |

**Table 2.** Calculations Internal Factor Evaluation (IFE) Matrix

| No | Analysis factors | Weight | Ratings | Score |
|---|---|---|---|---|
| | Strength – *Strength* (S) | | | |
| 1 | Desire high recovery from LBP patients | 0.19 | 5 | 0.95 |
| 2 | Hydrotherapy is method that does not involve procedure surgery, so safer with more risk low. | 0.12 | 4 | 0.48 |
| 3 | Hydrotherapy help reduce frequent stress and anxiety accompanying LBP. | 0.19 | 3 | 0.57 |
| 4 | Intervention in water provides resistance naturally possible increase balance body and strength muscle without give pressure excess in the body | 0.12 | 3 | 0.36 |
| | **Total Strength** | 0.62 | | 2.36 |
| | Weakness – Weakness (W) | | | |
| 1 | Awareness patient will caution do movement activity a day still not enough. | 0.12 | 2 | 0.24 |
| 2 | Understanding patient in habit guard posture body when move that can worsening LBP still low. | 0.07 | 2 | 0.14 |
| 3 | There isn't any yet protocol variation exercise covers all over aspect ROM intervention hydrotherapy. | 0.19 | 3 | 0.57 |
| Total Weakness | | 0.38 | | 0.95 |
| **Total IFE** | | **1.00** | | 3.31 |
| **SW (2.36-0.95)** | | | | **1.41** |

**Table 3.** Calculation External Actor Evaluation (EFE) Matrix

| No | Analysis factors | Weight | Ratings | Score |
|---|---|---|---|---|
| | Opportunities – *Opportunities* (O) | | | |
| 1 | Society is getting better aware about importance health and management painful with intervention hydrotherapy. | 0.2 | 4 | 0.8 |
| 2 | Need importance educate patients and society general about benefit hydrotherapy and methods dealing with LBP | 0.2 | 5 | 1.0 |
| Total *Opportunities* | | 0.4 | | 1.8 |
| Threats – *Threats* (T) | | | | |
| 1 | There isn't any yet community public in the intervention program hydrotherapy. | 0.3 | 2 | 0.6 |
| 2 | Not yet available facility hydrotherapy | 0.3 | 2 | 0.6 |
| Total *Threats* | | 0.6 | | 1,2 |
| **Total EFE** | | 1.00 | | 4.8 |
| **OT ( 2.44-1.99)** | | | | **0.6** |

Figure 2. SWOT Analysis diagram

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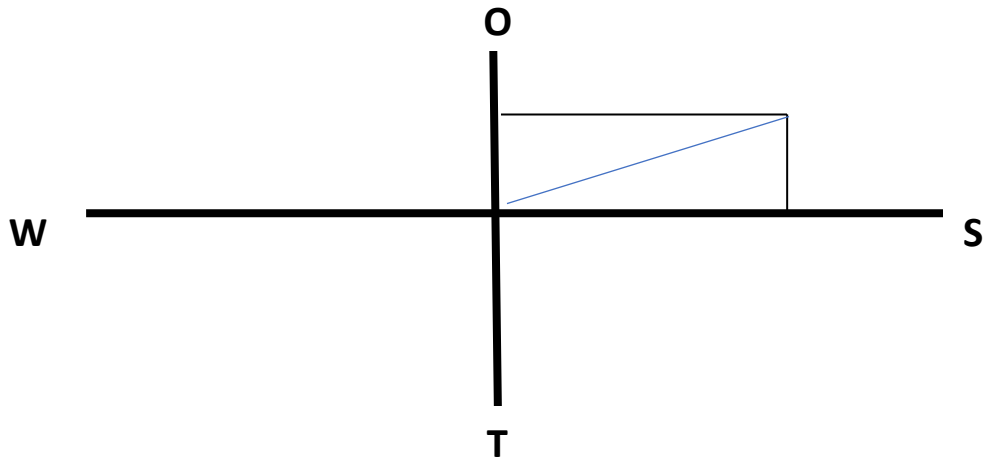


**Table 4.** Completion Strategy Problem

| **Internal Factors** / **Factor External** | **STRENGTH** | **WEAKNESS** |
|---|---|---|
| | - Desire high recovery from LBP patients<br>- Hydrotherapy is method that does not involve procedure surgery, so safer with more risk low<br>- Hydrotherapy help reduce frequent stress and anxiety accompanying LBP. | - Awareness patient will caution do movement activity a day still not enough.<br>- Understanding patient in habit guard posture body that can worsening LBP still low.<br>- There isn't any yet protocol variation exercise covers all over aspect ROM intervention hydrotherapy.<br>- Intervention in water provides resistance naturally possible increase balance body and strength muscle without give pressure excess in the body |
| **OPPORTUNITY** | **SO, STRATEGY** | **WO STRATEGY** |
| - Society is getting better aware about importance health and management painful with | - There is supportive activities desire strong enough to recover from patient in form group or community.<br>- Do intervention hydrotherapy into the | - Formation community intervention hydrotherapy.<br>- Provided facilities for intervention hydrotherapy |

| | | |
|---|---|---|
| intervention hydrotherapy.<br>- Need importance educate patients and society general about benefit hydrotherapy and methods dealing with LBP | internal therapy options handling LBP in the poly clinic<br>- Educate patients and society with counseling about intervention hydrotherapy good for improving ROM and coping painful so overcome LBP problem. | - A protocol was created to do this intervention hydrotherapy made easy applied by the patient<br>- Educate patient How do activity the right way to avoid it every day from LBP injury.<br>- Educate correct posture so as not to worsen LBP condition. |
| **THREATS** | **STRATEGY ST** | **WT STRATEGY** |
| There isn't any yet community public in the intervention program hydrotherapy.<br>Not yet available facility hydrotherapy. | - Need made community and holding facility hydrotherapy in the intervention program hydrotherapy and can reduce stress as well as frequent anxiety accompanying LBP.<br>- Educate family patient for repetition and mentoring intervention hydrotherapy. | - Made group or community to support public in the intervention program hydrotherapy<br>- Done socialization about intervention hydrotherapy<br>- Provided facilities and infrastructure hydrotherapy. |

## DISCUSSION

Residency is carried out at Dr. M. Goenawan Partowidigdo Pulmonary Hospital, which has a physiotherapy program. Residency members do activity counseling form hydrotherapy for LBP patients, uses introduce method hydrotherapy to patients at Dr. M. Goenawan Partowidigdo Pulmonary Hospital. Participant is partially asthmatic exercise participants big profession as housewife stairs and complained painful waist and decrease in ROM. From the results examination, found that lots patient experience limitations in movement daily due to LBP. Through fishbone analysis, found a number of factors contributing causes against LBP, such as lack awareness patient, low understanding about correct posture, and lack of facility adequate hydrotherapy. Based on USG analysis, priority a must problem quick handled is lack understanding patient about appropriate and safe activities, yet there is an SOP regarding intervention hydrotherapy, as well not yet availability facilities and infrastructure for hydrotherapy. Plan intervention covers counseling about importance hydrotherapy, development community patient to support each other, as well provision facility more hydrotherapy Good.

## CONCLUSION

Based on the analysis using the fishbone diagram, USG method, and SWOT framework, it is clear that hydrotherapy is a promising intervention to improve range of motion (ROM), reduce pain, and support balance recovery in patients with musculoskeletal low back pain

(LBP) at Dr. M. Goenawan Partowidigdo Pulmonary Hospital. However, several critical challenges were identified, including patients' limited awareness about safe daily activities, lack of standardized hydrotherapy protocols, and inadequate facilities.

The USG method highlighted that the highest priority issues are improving patient education on appropriate movement and expanding access to hydrotherapy infrastructure. Meanwhile, the SWOT analysis emphasized the hospital's strengths such as motivated patients and the non-invasive nature of hydrotherapy, alongside weaknesses like insufficient patient knowledge and the absence of a comprehensive intervention protocol.

Opportunities lie in increasing community awareness and education efforts, while threats include the absence of established hydrotherapy programs and facilities. Therefore, to maximize the benefits of hydrotherapy, it is essential to develop structured patient education programs, establish hydrotherapy protocols, and invest in appropriate facilities.

By addressing these factors through targeted strategies—such as forming patient support groups, enhancing counseling services, and improving infrastructure—the hospital can effectively overcome barriers and improve clinical outcomes. Ultimately, these efforts are expected to lead to better management of LBP, increased patient mobility, reduced pain, and an improved quality of life.

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