

Individual factors influencing compliance to lumbar sacral orthosis usage among patients aged 40-60 years fitted at Mulago National Referral Hospital, Kampala District.

A cross-sectional study.

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Abstract

Background:

Compliance with lumbar sacral orthosis (LSO) use is essential for effective management of low back pain. This study assessed individual factors influencing compliance with LSO usage among patients aged 40–60 years fitted at Mulago National Referral Hospital, Kampala District.

Methodology:

A cross-sectional study was conducted among 62 patients aged 40–60 years with low back pain who had been fitted with LSO at Mulago National Referral Hospital. Participants were selected using purposive sampling. Data were collected using interviewer-administered structured questionnaires containing open- and closed-ended questions. Data were analyzed using SPSS and presented in tables, charts, and percentages.

Results:

The majority of respondents were female (68.3%) and aged 56–60 years (51.6%). Most respondents (66%) had been diagnosed with low back pain, with 36.6% experiencing symptoms for more than one year. About 61% had previously received treatment, mainly topical analgesics (60%). Nearly half (49%) had been prescribed LSO. Among LSO users, 50% reported wearing the orthosis during certain activities, while 30% wore it daily. Half of the respondents rated comfort at the lowest scale level. More than half (60%) experienced discomfort or side effects, including pain. Additionally, 50% had used LSO for more than one year, suggesting perceived long-term benefits despite challenges.

Conclusion:

Compliance with LSO usage among patients aged 40–60 years was strongly influenced by comfort, side effects, perceived pain relief, and convenience during activities. Although many patients recognized benefits and continued long-term use, discomfort limited consistent adherence.

Recommendations:

Healthcare providers should conduct individualized fitting, regular follow-up adjustments, and patient education on correct LSO use. Improving orthosis comfort, design, and counseling may enhance compliance and treatment outcomes among patients with low back pain.

Keywords: Lumbar sacral orthosis, low back pain, patient adherence, individual factors, Mulago National Referral Hospital.

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Background.

Patient compliance with lumbar sacral orthosis (LSO) usage can be influenced by a variety of individual factors. These factors can vary from person to person and can impact the willingness and ability of patients to adhere to the prescribed use of LSO. In the study to establish the relationship between demographic characteristics of patients with low back pain and their compliance with treatment in New York, USA, it was revealed that male participants (60%) were more compliant with treatment than females (42%), also

married participants (56%) were more compliant than the single people (45%) Alexandre et al, (2019). Patients' perception of the benefits of wearing the LSO is essential. Healthcare providers should explain the potential advantages of LSO usage, such as improved spinal support, reduced pain, and enhanced mobility. In Takeda General Hospital, Japan, a study to assess the individual factors influencing patient compliance with LSO, it was revealed that providing patients with clear and comprehensive education (67%) about the purpose, benefits, and

importance of LSO usage can positively impact compliance (Yoshihiro et al, 2017).

Understanding the role of the orthosis in supporting their spine and managing low back pain can motivate patients to adhere to the prescribed usage. A patient's motivation and attitude toward their treatment can greatly impact compliance. Patients who are motivated to improve their condition and have a positive attitude are more likely to adhere to LSO usage. Patient motivation and attitude towards their condition and treatment can significantly affect compliance. Patients who have a positive attitude and are motivated to alleviate their low back pain are more likely to adhere to LSO usage. On the other hand, patients who are skeptical or lack motivation may struggle with compliance. The relationship that health history and low back pain history had with treatment compliance in Gondar town, northwest Ethiopia, indicated that participants who had a previous history of LBP (49%) were more compliant with treatment than those who did not have a history of LBP (48%), Tesfaye et al (2018). Furthermore, the study established that participants whose treatment duration was 2-3 weeks were more compliant with treatment (69%) than those whose treatment duration was 4 weeks (51%) and those whose treatment duration was 5-6 weeks (33%).

The comfort and fit of the LSO play a significant role in compliance. An LSO that is uncomfortable, too tight, or too loose can lead to discomfort and decreased compliance. Custom-fitted orthoses are often more comfortable and tend to improve compliance. A study in Uganda by Aleku et al (2021) regarding lower back pain as an occupational hazard among Ugandan health workers indicated that the comfort and fit of the LSO played a crucial role in patient compliance. If the orthosis was uncomfortable, ill-fitting, or caused skin irritation, patients would be less inclined to use it consistently. Ensuring proper sizing, adjustments, and padding could improve comfort and encourage compliance. Patients are more likely to comply with LSO usage if they experience significant pain relief when wearing the orthosis. If the device effectively reduces their low back pain, they are more motivated to continue using it as prescribed. Findings of the study further indicated that participants who experienced significant pain relief (74%) while wearing the LSO were more likely to comply with its usage. The participants who perceived that the orthosis effectively reduced their low back pain and discomfort (52%) were more motivated to continue using it as prescribed. It is important for healthcare professionals to address these individual factors and tailor interventions to improve patient compliance with LSO usage. By considering patient-specific needs, concerns, and motivations, healthcare providers can enhance the effectiveness of LSO treatment and support patients in managing their low back pain. This study assessed individual factors influencing compliance with

LSO usage among patients aged 40–60 years fitted at Mulago National Referral Hospital, Kampala District.

Methodology.

Study Area.

The hospital is on Mulago Hill in the northern part of the city of Kampala, immediately west of the Makerere University College of Health Sciences. It is approximately 5 Kilometers (3 mi), by road, north-east of Kampala's central business district. The geographical coordinates of the hospital are 0°20'16.0"N, 32°34'32.0" E (Latitude: 0.337786; Longitude: 32.575550). This hospital, together with adjacent, affiliated hospitals and institutions, constitutes Mulago Hospital Complex, the teaching facility of the Makerere University College of Health Sciences. The hospital offers services in most medical and surgical subspecialties, in addition to dentistry, emergency medicine, pediatrics, and intensive care. Old Mulago Hospital was founded in 1913 by Albert Ruskin Cook. New Mulago Hospital was completed in 1962. The hospital has an official capacity of 1,790 beds, although it often houses over 3,000 patients.

Study Design.

The study employed a prospective cohort study design for assessing the impact of lumbosacral orthosis in the management of low back pain among patients aged between 40 and 60 years fitted at Mulago National Referral Hospital. It was for enabling the dependent and independent variables to be assessed at the same time, and there was no follow-up of the study participants.

Study Population.

The study population consisted of patients with lower back pain aged between 40 and 60 years at Mulago Hospital.

Sample Size Determination.

The sample size was calculated using the formula developed by Kish and Leslie (1965), given by;

$$n = \frac{z^2 p (1-p)}{d^2}$$

Where;

“n” was the sample size required

“p” was the estimated impact of lumbosacral orthosis in the management of low back pain among patients aged between 40 and 60 years fitted at Mulago National Hospital.

p= 4.3%, which was equivalent to 0.043

d=0.05 was the acceptable error of estimation at 95% confidence interval. Z was the confidence interval at 95% =1.96

$$q = 1 - p$$

$$n = \frac{2pq(1-p)}{d^2} = (1.96^2 \times 0.043 \times 0.95) \div (0.05 \times 0.05) = 62$$

Therefore, a sample of 62 patients aged between 40 and 60 years with low back pain being fitted with a lumbosacral orthosis at Mulago hospital was needed.

Sampling Techniques.

The study participants were selected using a purposive sampling method. The study purposely approached patients aged between 40 and 60 years with low back pain being fitted with a lumbosacral orthosis at Mulago Hospital.

Data Collection Method.

In the study, a structured questionnaire was employed during data collection. The questions were set according to the specific objectives, and the interviewer administered the questionnaire with both open and closed-ended questions to respondents. An interpreter was required to translate for clients who did not know English.

Data Collection Tools

Questionnaires were administered to the participants to collect information regarding the impact of lumbosacral orthosis in the management of low back pain among patients aged between 40 and 60 years fitted at Mulago National Referral Hospital.

Study Variables.

The independent variables were the individual factors influencing compliance with the use of lumbar sacral among patients aged 40-60 years.

The dependent variable was the impact of lumbosacral orthosis in the management of low back pain among patients aged between 40 and 60 years.

Quality Control.

Sample size was determined using the approved formula. Pre-testing of the data collection tools was done prior to the actual data collection by conducting a pilot study to determine the validity of the data collection tool.

Data analysis and Presentation.

Data analysis was done by use of SPSS (Statistical Package for Social Sciences). Data was collected from questionnaires filled by the respondents, counted to ensure that all were returned, and checked for completion. The results for all objectives and essay questions were examined, categorized, and presented in summarized separate graphs, frequency tables, and pie charts.

Inclusion Criteria

Patients aged between 40 and 60 years with low back pain are being fitted with a lumbosacral orthosis at Mulago Hospital, as well as patients willing to use LSO as part of the treatment.

Exclusion Criteria.

Patients with other serious spinal conditions, such as fractures, tumors, and spinal surgeries, as well as patients contraindicated from wearing an LSO.

Ethical Considerations.

An introductory letter was obtained from the UIAHMS from the School of Orthopaedic Technology, which was introduced to the administrator of Mulago hospital and other stakeholders, where the study took place, and permission was granted to continue with the study. Informed consent, both oral and written, was taken from the respondents, and they were reassured of the confidentiality of their information obtained.

Results

Social demographic characteristics of respondents

Table 1: Showing the demographic data of respondents

Variables	Responses	Frequency(f)	Percentage (%)
Marital status	Married	33	53.22
	Single	12	19.35
	Widow	08	12.90
	Divorced	09	14.52
Age	40- 45 years	07	11.29
	46-50 years	09	14.52
	51-55 years	14	22.58
	56-60 years	32	51.61
Education level	Primary	32	51.61
	Secondary	20	32.26
	Tertiary	10	16.13

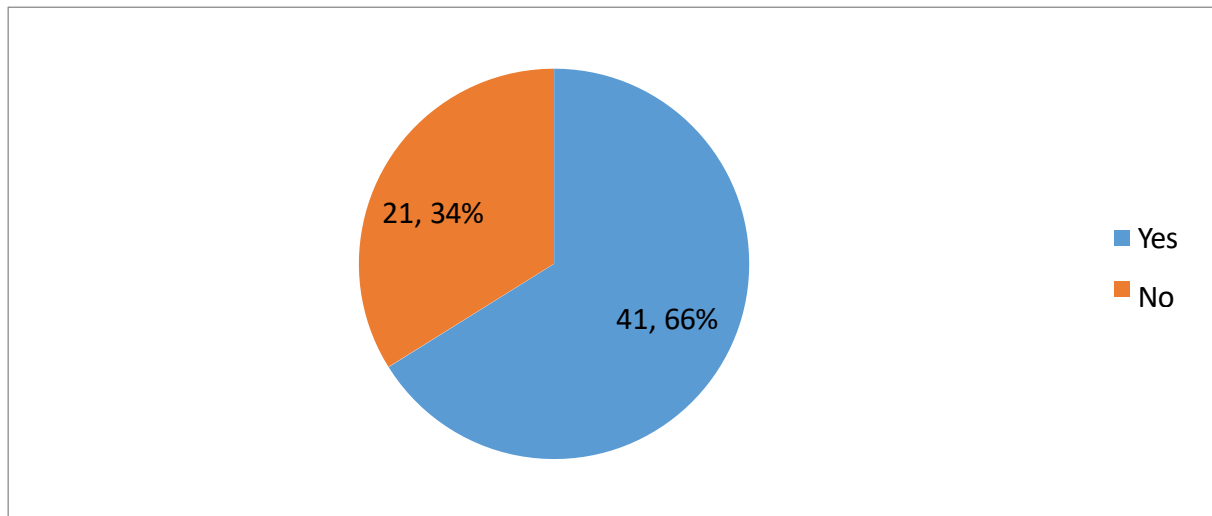
Gender	Female	41	68.33
	Male	2	31.67

(Source: Primary Data, 2023).

From table 1, majority 33(53.22%) of the respondents were married, 12(19.35%) were single, 09(14.52%) were divorced, whereas the minority 08(12.90%) were widowed. Also, most of the respondents, 32(51.61%), were aged 56-60 years, 14 (22.58%) were aged 51-55 years, 09(14.52%) were aged 46-50 years, while the least, 07 (11.29%), were

aged 40-45 years. Pertaining to the education level, the majority of respondents, 32(51.61%), had a primary level of education, 10 (16.13%) had secondary school level, whereas a minority, 10 (16.13%) were of tertiary level. Concerning gender, the majority of the respondents, 41(68.33%), were females, with a few, 21 (31.67%), as males.

Figure 1: Showing whether the respondent had been diagnosed with low back pain.



(Source: Primary Data, 2023).

From Figure 1, the majority, 41(66%) of the respondents reported that they had been diagnosed with low back pain, whereas the minority, 21(34%), were not diagnosed with low back pain.

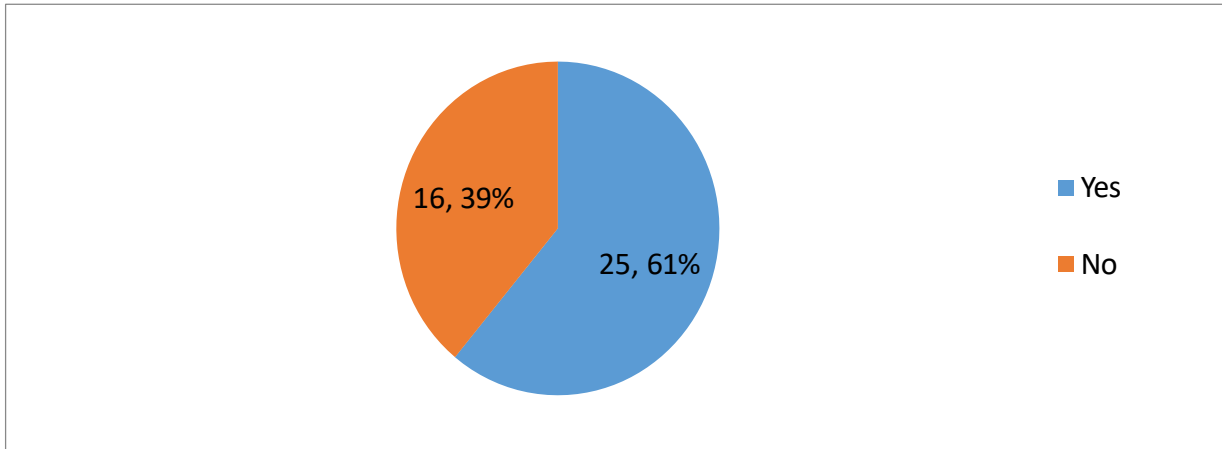
Table 2: showing how long the respondents had experienced the low back pain, N =41

Responses	Frequency	Percentage %
1-6 days	6	14.63
1-4 weeks	08	19.51
1 -12 months	12	29.27
1 or more years	15	36.58

(Source: Primary Data, 2023).

From table 2, nearly half 15(36.58%) of the respondents had experienced the low back pain for between a period of 1 and more years, 12(29.27%) reported 1-12 months, 08(19.51%) reported 1-4 weeks, and the minority 06(14.63%) reported 1-6 days.

Figure 2: Showing whether respondents had ever received any previous management of low back pain.



(Source: Primary Data, 2023)

From figure 2, the majority 25(61%) of the respondents had received previous management for low back pain, whereas the minority 16(39%) had not received.

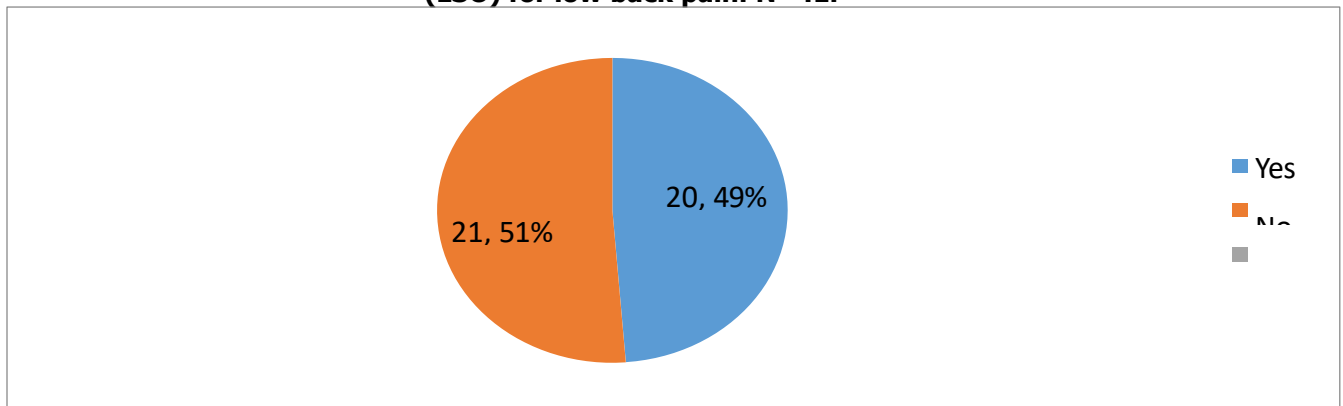
Table 3: showing the treatments for low back pain received by the respondents, N=25

Response	Frequency(f)	Percentage%
Topical analgesics	15	60
Oral analgesics	10	40
Total	25	100

(Source: Primary Data, 2023)

From table 3, the majority 15(60%) of the respondents had received topical analgesics for the low back pain, while the minority 10(40%) had received oral analgesics.

Figure 3: Showing whether the respondents had been prescribed a lumbosacral orthosis (LSO) for low back pain. N=41.



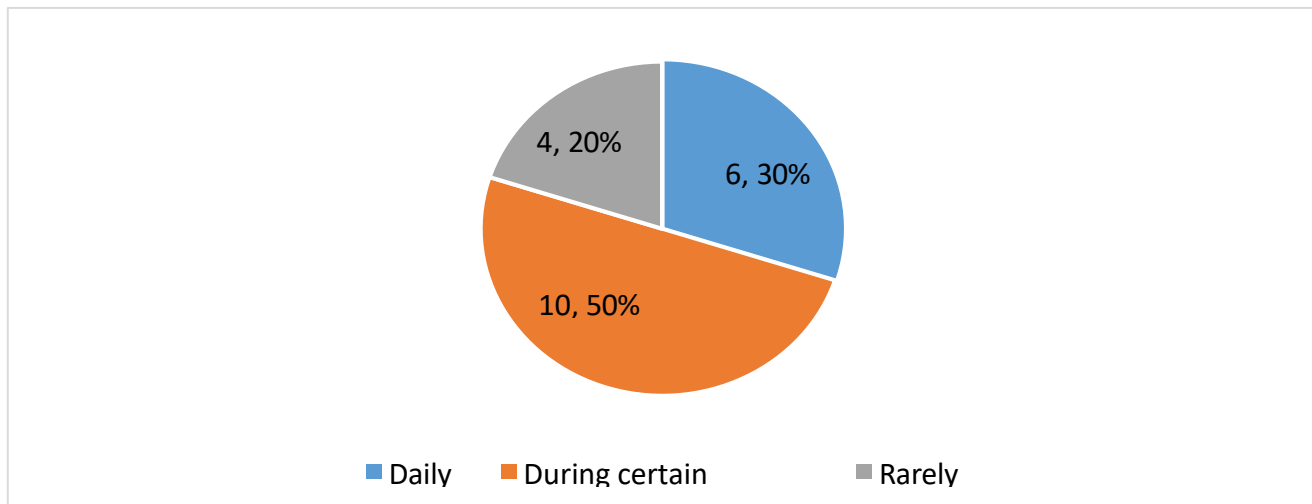
(Source: Primary Data, 2023).

From figure 3, the majority, 21(51%) of the respondents had not been prescribed a lumbosacral orthosis (LSO) for low back pain, whereas a minority, 20(49%) had been prescribed an LSO for the low back pain.

Lumbosacral orthosis usage

Figure 4: showing how often the respondents used to wear the LSO.

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(Source: Primary Data, 2023)

From figure 4, most, 10(50%) of the respondents wore the LSO during certain activities, 6(30%) wore the LSO daily, whereas the least wore the LSO rarely.

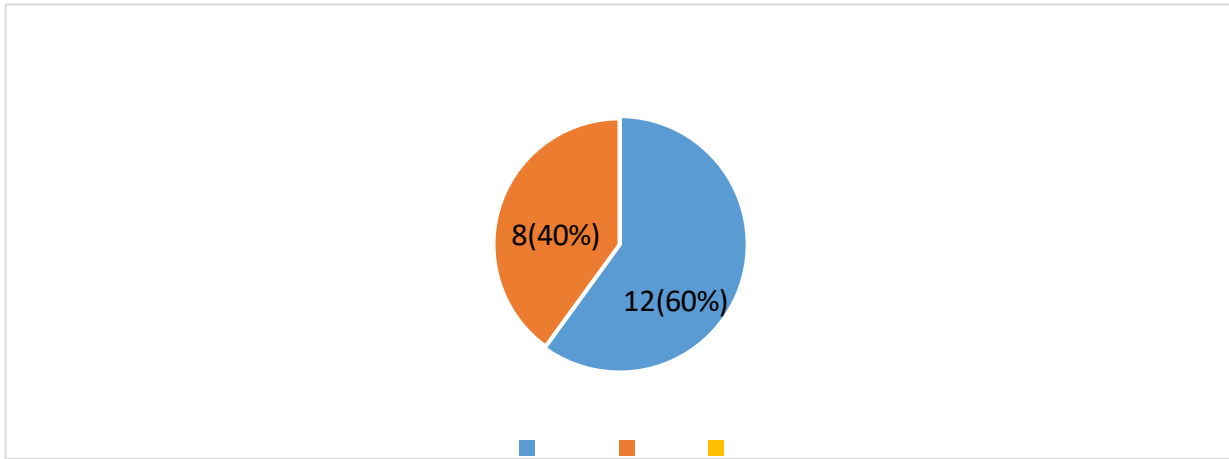
Table 4: showing how the respondents rated the comfort of their LSO. N=20

Responses	Frequency(f)	Percentage %
Comfort at scale 1	10	50
Comfort at scale 2	04	20
Comfort at scale 3	02	10
Comfort at scale 4	04	20

(Source: Primary Data, 2023).

From table 4, half 10(50%) of the respondents rated the comfort of their LSO at scale level 1, 04(20%) rated their LSOs at scale levels 2 and 4, while a minor 02(10%) rated the comfort of their LSO at scale level 3.

Figure 5: Showing whether participants experienced any side effects or discomfort when wearing LSO. N=20.



(Source: Primary Data, 2023)

From figure 5, more than half 12(60%) of the participants experienced side effects or discomfort when wearing LSO, while a minority (8, 40%) had not experienced any side effects.

Table 5: Showing the side effects of LSO as reported by respondents N=12

Responses	Frequency(f)	Percentage %
Causes discomfort	12	60
Sometimes causes some pain	08	40
Total	12	100

From table 5, the majority 12(60 %) of the respondents reported that their LSO caused some discomfort, and a minority 08(40%) mentioned that it was sometimes painful.

Table 6: showing the duration that the respondents had been using LSO. N=20

Responses	Frequency(f)	Percentage%
1-6 days	01	05
1-4 weeks	05	25
1 -12 months	04	20
1 or more years	10	50

(Source: Primary Data, 2023)

From table 6, the majority 10(50%) of the respondents mentioned that they had been using LSO for a period of between 1 and more years, 05(25%) reported 1-4 weeks, 04(20%) reported 1-12 months, whereas the minority 01(5%) of the participants mentioned 1-6 days of LSO use.

Discussion of results.

A significant majority of respondents (53.22%) were married. This suggests that individuals in a marital relationship are more likely to seek interventions such as LSO for the management of low back pain. The implication is that healthcare providers should consider the impact of marital status on healthcare-seeking behavior and tailor

interventions accordingly. Regarding the age, the majority of respondents (51.61%) were aged between 56 and 60 years. This age distribution may indicate that individuals in this older age group are more likely to experience or seek treatment for low back pain. The implication is that healthcare strategies and interventions should be tailored to address the specific needs and challenges faced by individuals in this age category. Concerning education levels, a significant number of respondents (51.61%) had a primary level of education. This demographic characteristic may influence the level of health literacy and understanding of interventions such as LSO. The implication is that healthcare providers should adopt communication strategies that are accessible and comprehensible to individuals with varying levels of education. Finally, the majority of respondents (68.33%) were females. This gender distribution suggests that females are more represented in the study population seeking interventions for low back pain. The implication is that healthcare providers should be attentive to potential gender-specific factors influencing the experience and management of low back pain. Findings indicate that most, 10(50%) of the respondents wore the LSO during certain activities. This suggests that respondents may perceive the need for additional support or protection during specific movements or situations. The implication is that LSO is being used as a targeted intervention rather than as a continuous or preventive measure. This does not agree with a study done in Canada by Jackson et al. (2021), which showed that respondents put on their LSO regularly throughout, without removal or prioritizing activities. The majority, 10(50%) of the respondents rated the comfort of their LSO at scale level 1 out of 5. This indicates that there is variability in the perceived comfort of LSO among users. The reasons behind this mixed comfort rating should be explored further to address any issues affecting user satisfaction. This is in agreement with a study done in New York, USA by Alexandre et al (2019), which revealed that the majority of the respondents (60%) were not comfortable with their LSO. More than half 12(60%) of the participants experienced side effects or discomfort when wearing LSO. This could be due to the fact that understanding the specific nature of discomfort reported by users is essential for tailoring interventions and improving the design or fit of LSO to enhance overall satisfaction and compliance. This disagrees with a study done in Japan by Yoshihiro et al (2017), which revealed that (25%) of the respondents were comfortable with their LSO. Results indicated majority, 10(50%) of the respondents mentioned that they had been using LSO for a period of 1 year or more, 05(25%). This suggests that LSO has been integrated into the long-term management strategies of individuals experiencing low back pain. The implication is

that there is a perceived benefit in using LSO over an extended period. This agrees with a study done in Uganda by Nadine E Foster (2011) revealed that most (46%) respondents had spent more than a year with their LSO.

Conclusion

The feedback from patients, as indicated in additional comments (65%), revealed that while LSO was considered good, it sometimes made them uncomfortable. This underscores the need for improvements in LSO design, fitting, and ongoing adjustments to minimize discomfort and enhance overall satisfaction.

Study Limitations.

The study experienced financial constraints during the study.

Additionally, Participants refused to provide responses, and this was solved by explaining to them properly the purpose of the study.

Recommendation.

Individualized Assessment and Fitting: Conduct thorough individualized assessments before prescribing LSO to patients in the 40-60 age group. Tailor the fitting process to the specific anatomical and comfort needs of each patient, considering variations in body shape and size.

Acknowledgement.

I express my deepest gratitude to the Almighty God for enabling me to accomplish this work. My sincere appreciation goes to my supervisor, **Mr. Asimwe Ambrose**, for the time he has given me during the development of this research. Through his technical support, guidance, and direction during the development of this research report, I was able to finalize successfully.

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In a special way, I thank my classmates for their academic support and advice rendered to me in preparation for this research report.

May God richly bless them all.

List of Abbreviations

LSO – Lumbar Sacral Orthosis

LBP – Low Back Pain

SPSS – Statistical Package for the Social Sciences

UIAHMS – Uganda Institute of Allied Health and Management Sciences

N – Number of respondents/sample size

f – Frequency

% – Percentage

USA – United States of America

Informed Consent:

Written informed consent was obtained from all participants prior to their inclusion in the study. Participants were informed about the purpose of the study, procedures involved, potential risks and benefits, and their right to withdraw at any time without penalty.

Source of funding.

The study was not funded.

Conflict of interest.

There is no conflict of interest.

Availability of data.

Data used in this study are available upon request from the corresponding author.

Authors contribution.

WW designed the study, conducted data collection, cleaned and analyzed data, and drafted the manuscript.

AA supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

Author's biography.

Wicklif Wepukhulu is a student of a diploma in Orthopaedic technology at Uganda Institute of Allied Health and Management Sciences-Mulago.

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