

Exploring The Awareness and Application of Maitland's Theory Among Physiotherapists in Southern Libya: A Quantitative and Qualitative Investigation

Ibrahim Omar Mohamed El-Feki ^{1*}, Hammza Mohammed Othman Zidan ²

¹ Department of Public Health, Faculty of Nursing, Sebha University, Sebha, Libya

² Department of Physiotherapy, Faculty of Medical Technology, Murzuq, Fezzan University, Murzuq, Libya

استكشاف الوعي وتطبيق نظرية ميتلاند بين أخصائيي العلاج الطبيعي في جنوب ليبيا: بحث كمي ونوعي

إبراهيم امير محمد الفقي^{1*}، حمزه محمد عثمان زيدان²
¹ قسم الصحة العامة، كلية التمريض سبها، جامعة سبها، ليبيا
² القسم العلاج الطبيعي، كلية التقنية الطبية مرزق، جامعة فران، مرزق، ليبيا

*Corresponding author: Physical.Therapy.ibr@gmail.com

Received: January 31, 2026

Accepted: February 28, 2025

Published: March 19, 2026



Copyright: © 2026 by the authors. This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract:

This quantitative and qualitative cross-sectional study aims to investigate the awareness and application of Maitland's Theory among physiotherapists in Southern Libya. The research addresses a critical gap in the literature concerning the utilization of Maitland mobilization techniques in the region, given the unique healthcare challenges faced by Libya, particularly in its Southern region. Drawing on a sample size of 380 physiotherapists, data will be collected using a structured questionnaire administered electronically through platforms such as Google Forms. The questionnaire will include sections assessing socio-demographic information, levels of awareness and familiarity with Maitland's Theory, utilization of Maitland mobilization techniques in clinical practice, and perceived barriers to adoption. The study participants will consist of licensed physiotherapists actively engaged in clinical practice across various healthcare settings in Southern Libya. Data analysis will involve descriptive and inferential statistics to summarize demographic characteristics, explore relationships between variables, and identify factors associated with awareness and utilization of Maitland's Theory. The validity and reliability of the research instrument will be ensured through content validity, pilot testing, and test-retest reliability analysis. Ethical considerations will be addressed by obtaining approval from the institutional review board and ensuring participants' informed consent, confidentiality, and voluntary participation. The findings of this study are expected to provide valuable insights into the current state of physiotherapy practice in Southern Libya, potentially informing targeted interventions to enhance the knowledge and skills of physiotherapists and improve the quality of musculoskeletal care delivery in the region.

Keywords: Maitland's Theory, Southern Libya, Maitland Mobilization Techniques. Physiotherapists, Platforms

المخلص

تهدف هذه الدراسة المقطعية الكمية والنوعية إلى التحقيق في الوعي وتطبيق نظرية ميتلاند بين أخصائيي العلاج الطبيعي في جنوب ليبيا. يتناول البحث فجوة حرجة في الأدبيات المتعلقة باستخدام تقنيات تعبئة ميتلاند في المنطقة، نظراً للتحديات

الفريدة التي تواجهها الرعاية الصحية في ليبيا، لا سيما في إقليمها الجنوبي. بالاعتماد على عينة حجمها 380 من أخصائيي العلاج الطبيعي، سيتم جمع البيانات باستخدام استبيان منظم يتم توزيعه إلكترونياً عبر منصات مثل نماذج جوجل. سيتضمن الاستبيان أقساماً تقم المعلومات الاجتماعية والديموغرافية، ومستويات الوعي والإلمام بنظرية ميتلاند، واستخدام تقنيات تعبئة ميتلاند في الممارسة السريرية، والعوائق المحسوسة أمام التبني. ستتألف عينة الدراسة من أخصائيي العلاج الطبيعي المرخصين والممارسين بشكل نشط في بيئات رعاية صحية متنوعة في جنوب ليبيا. سيتم تحليل البيانات باستخدام الإحصاء الوصفي والاستدلالي لتلخيص الخصائص الديموغرافية، واستكشاف العلاقات بين المتغيرات، وتحديد العوامل المرتبطة بالوعي واستخدام نظرية ميتلاند. سيتم ضمان صلاحية وموثوقية أداة البحث من خلال الصلاحية المحتوية، والاختبار القبلي، وتحليل موثوقية الاختبار وإعادة الاختبار. سيتم معالجة الاعتبارات الأخلاقية من خلال الحصول على موافقة من مجلس المراجعة المؤسسي وضمان الموافقة المستنيرة للمشاركين وسرية معلوماتهم ومشاركتهم الطوعية. من المتوقع أن تقدم نتائج هذه الدراسة رؤى قيمة حول الحالة الراهنة لممارسة العلاج الطبيعي في جنوب ليبيا، مما قد يساهم في توجيه التدخلات المستهدفة لتعزيز معارف ومهارات أخصائيي العلاج الطبيعي وتحسين جودة تقديم الرعاية للجهاز العضلي الهيكلي في المنطقة.

الكلمات المفتاحية: نظرية ميتلاند، جنوب ليبيا، تقنيات تعبئة ميتلاند، أخصائيو العلاج الطبيعي، منصات.

Introduction

This study is built on the background of Maitland's Theory and its application, awareness and knowledge amongst physiotherapists in Southern Libya. Libya, situated in north Africa, has a history of medical services significantly affected by political instability and conflict. Although the country is not politically stable, but Libya still has active physiotherapists in medical fields. Example, according to ("Libya: World PT Day 2022," n.d.), the college of medical technology in Benghazi, Libya had actively worked together with World PT to gain the technology in physiotherapy, share the technology and knowledge, as well as build network for collaboration. There was research conducted by (Jahan et al., 2021) about the satisfaction level of physiotherapy services in Libya. The research outcomes highlighted that it was 50% satisfaction by the patients. The research was conducted in Libya health center and total respondents were 501. The suggestion given is the improvement still needed to make physiotherapy better.

There are numerous technologies or methods used across many clinics and hospitals in Libya applied in the physiotherapy. According to Libya Johari official pages (Digital, 2021), the modern physiotherapy like using the laser technology is used to relief the pain. The use of laser is called Orthopedic Physiotherapy, where the light exposed to the human's skin can help to relief the muscle pain.

The advantage of Orthopedic Physiotherapy introduces contactless, which is significant applied to the patients during pandemic time. With the important of physiotherapy, the Libya government had supported the physiotherapy education in the country and encourage more home-based physiotherapy (Jahan & Rwaiha, 2021). Currently, the physiotherapy in Libya not as popular as other countries. There are still have many gaps that the government and private sector need to go through to develop the physiotherapy in Libya. In general, the Libya physiotherapy can be divided into two types, the machine physiotherapy and human physiotherapy (Aa, 2016).

According to the paper (Sharma, 2017) there are 60% of physical therapy in Libya and 40% are physiotherapy. Most physical therapies are home-based. They use human skills to help the patient's relief the pain and recover their health.

Problem statement

This aim involves conducting a quantitative research study to determine knowledge about and utilisation of Maitland's Theory among physiotherapists in South Libya. Despite the much abundant literature worldwide regarding the effectiveness of Maitland approach in various musculoskeletal conditions and its global use, there is a remarkable scarcity in the literature about its utilization and awareness among physiotherapists in Libya, and particularly in the South Region (Kim et al, 2020; Paolucci et al, 2019; Yılmaz & Şahin, 2020; Al-Abboodi Al-Obaidi, 2019). Most of the studies in the existing literature are more focused on comparing Maitland mobilisation methods with other types of mobilisation methods, such as Mulligan method, to prove the usefulness of Maitland treatment techniques in various clinical settings and populations in diverse musculoskeletal conditions from low back pain to knee osteoarthritic pain and chronic mechanical neck pain (Kim et al, 2020; Paolucci et al, 2019; Yılmaz & Şahin, 2020; Al-Abboodi Al-Obaidi, 2019).

It is worth mentioning that there is a lack of studies about clinicians' knowledge of Maitland's Theory and its dissemination and implementation in Libyan health care setting. Also, the fact that the keywords used in the literatures search could not retrieve specific documentation on Maitland mobilisation techniques being used by

physiotherapists in Libya, let alone the rest of the countries in the southern region of the Mediterranean, hence there needs to be a precision investigation to explore this aspect and establish the extent to which physiotherapists are aware of it and to what extent they use it.

By embarking on a quantitative study, this research therefore aims at providing empirical data about the extent at which physiotherapists in southern Libya are aware of Maitland's Theory, the frequency at which they receive training in it and the extent

Methodology

The study design is the most important element of any investigation in that it contains all the elements that specify how data will be collected, analyzed and interpreted with which to achieve the aims or objectives of the research. In the example in relation to the awareness/an application of Maitland's Theory in practicing physiotherapists in Southern Libya, the study design has to be accurate and appropriate so as to avoid redundancy and ensure substantively the validity and reliability and generalizability of the results.

The research design for this study Is a quantitative and qualitative study. The proposed design allows the researcher to collect the data at a single point of time, and this give the snapshot of the awareness and the use of Maitland's Theory amongst Libyan physiologists. The research presented at the single point in time is an important factor in recognizing the current status of the practice and also the possible relationships between awareness level and demography.

This study focuses on current professional experience of physiotherapist working in Southern Libya to investigate job demands, stressors, personal characteristics, strategies and resources, and eventually determine the relationship between them from the sample group. Physiotherapists working in hospitals, clinics, rehabilitation centers, and other health care facilities will all be considered as part of the study population.

However, due to some obvious limitations in gathering a complete list of physiotherapists working in the region as well as the ability to contact them with the limited resources available, the study shall make use of a convenience sampling technique to carry out the needed participant recruitment. Participants studied are selected based on availability and willingness to participate in the study. This shall be achieved by employing various means of reaching out to participants who are members of professional bodies, health care institutions, and academic institutions.

Indeed, a sample this size allows the researcher to be reasonably confident about the estimates, which will be adequately precise and representative for drawing conclusions about knowledge and use of Maitland's Theory by physiotherapists in Southern Libya. The study will employ a structured electronic questionnaire consisting of three sections; first, the researcher will collect the socio-demographic information, then questions will be asked regarding the awareness/perception and familiarity of the Maitland's Theory and their clinical techniques, and finally; questions related to the barriers faced to accept or include the employment of Maitland's techniques in traditional-based and evidence-based physical therapy practice is gathered. The questionnaire will be pilot tested for clarity, comprehensiveness, and the study goals.

Their validity and reliability will be assessed through content validity, pilot testing and test-retest reliability. Content validity refers to whether the questionnaire is complete and measures the relevant constructs, whereas pilot testing is to check out the previous work by formulating questions for a small sample of participants, and refine the instrument accordingly.

Test-retest reliability analysis is taking the questionnaire back to a subset of participants twenty-one days later.

Descriptive statistics will be used to summarize demographic characteristics of the sample and main variables of interest (visualization skills, self-efficacy), while further inferential statistics such as chi-square tests, t-tests and regression analysis will be performed in order to explore relations between variables and predictors of awareness and utilization. In the latter case, the statistical software packages SPSS or R will be used. The overall research framework is shown in Figure 1. By looking into the research framework, it is seen that there are three important independent variables proposed to measure the level of familiarity and application of Maitland theory in physiotherapy. The first independent variable proposed is to meet the first research objective. The second independent variable proposed is to meet the second objective and the last independent variable is to meet the third objective of this research. For the last independent variable, the barrier variables will be put into the questionnaire directly in order to find out the problems on application and awareness of Maitland Theory. Note that each independent variable is given the code AMT, AMP, and BVA for easy analysis using the SPSS.

Similarly, the dependent variable is also given a code, LFM, which is important to assess the independent variable via the questionnaire. The coefficients r_1 to r_2 are the correlation coefficient. The correlation coefficient is used to measure how much each independent variable relates to the dependent variable. The lowest coefficient, 0 indicates no correlation whereas the highest coefficient, 1 indicates there is a significant correlation between two variables.

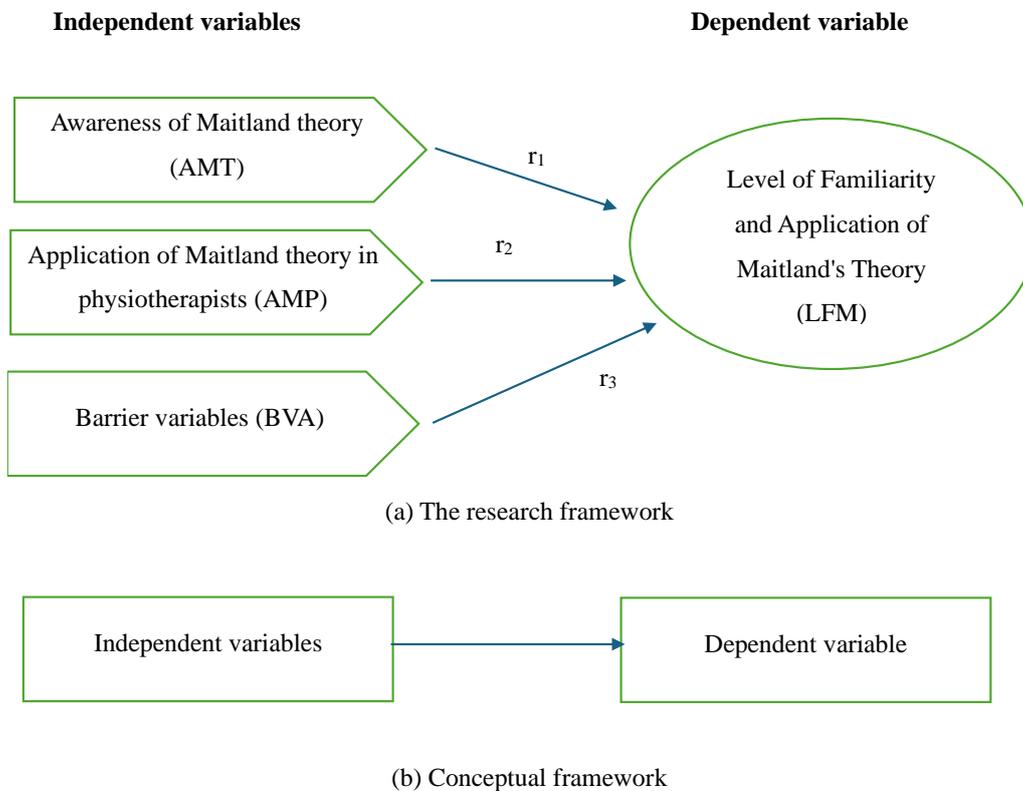


Figure 1: The research and conceptual framework. (a) The research framework and (b) Conceptual framework.

Figure 2 shows a systematic way of conducting the research. The diagram shows Figure 2, also known as CONSORT diagram which presents a guideline for the researcher to conduct the research. Figure 3 shows the overall method of conducting the research. As seen in Figure 3, there are approximately 200 samples available. This sample could be mixed. Therefore, to focus just samples taken from southern Libya, 100 samples are targeted.

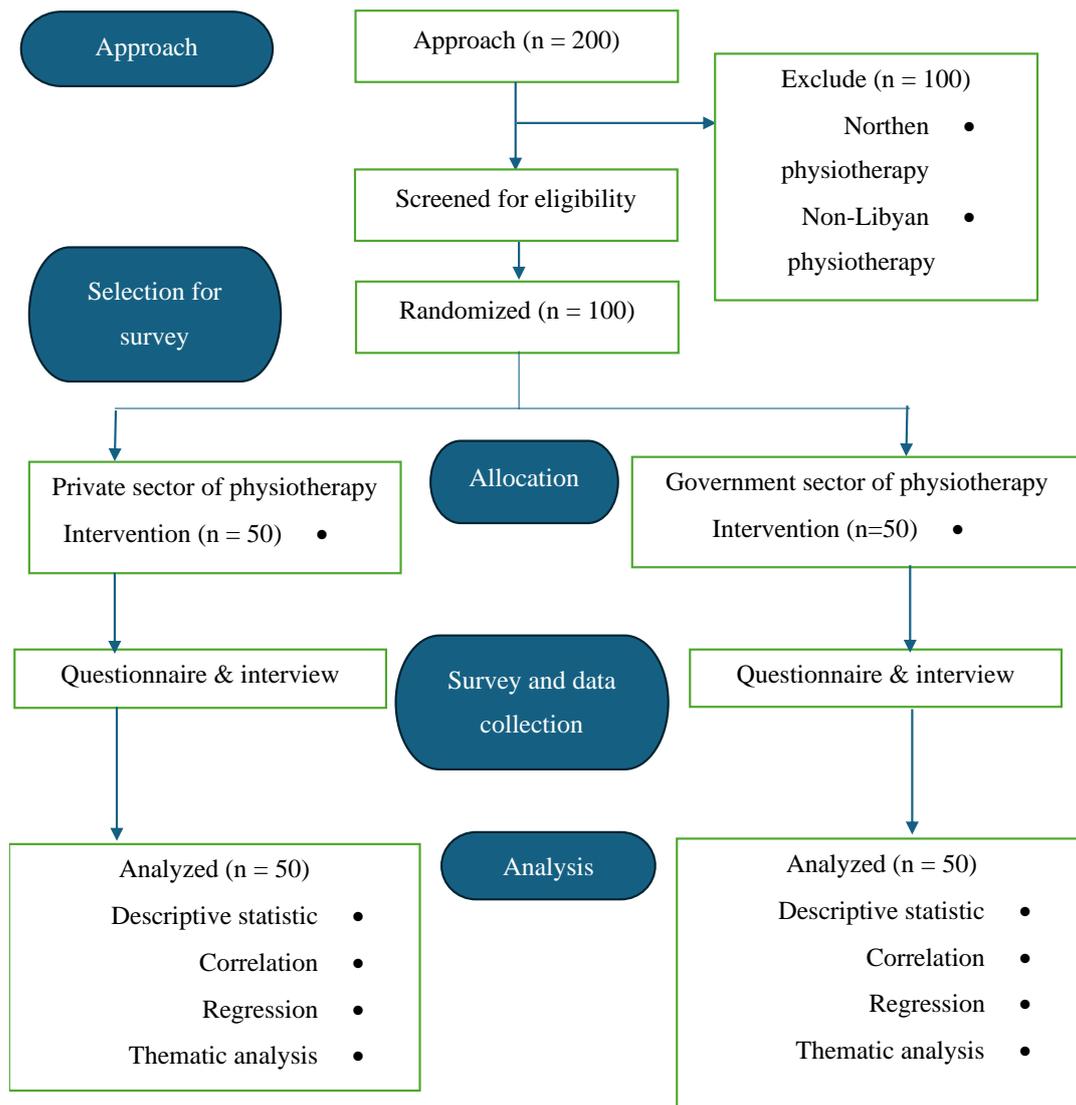


Figure 2: The flow of the research in detail on data collection and analysis

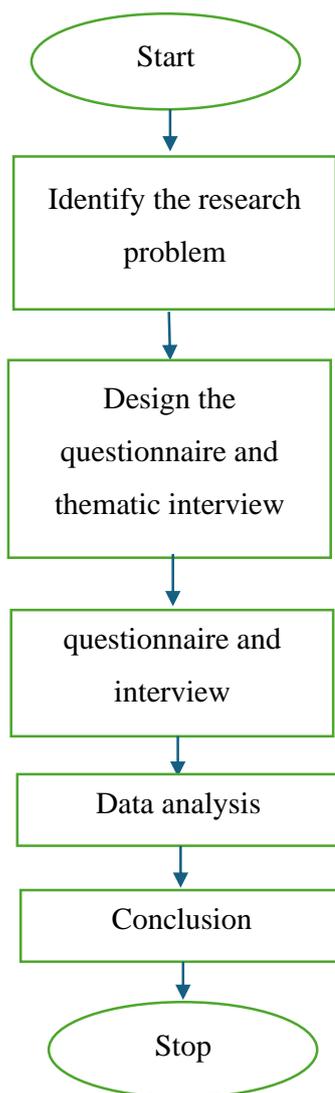


Figure 3: The overall plan of the research

In 100 samples, 50 samples will take from the private sector and the remaining 50 taken from the government sector. After allocating the sample size for each sector, the research then distributes a questionnaire and conducts an online interview via WhatsApp call or Google meet to collect the data.

From Figure 3, the research begins by identifying the problems. The problem in the research is whether Maitland's theory has been applied in physiotherapy or not. To find out the solution to the problem, the research suggests conducting a survey via questionnaire and interview. The data collection is online. The analysis of the data will be done using qualitative and quantitative methods. At the end of the research, the findings will know the detail of the Maitland theory whether it is widely used in the southern area of the Libya or not.

3.2 Population and Sample

The population of physiotherapists in south area of the Libya is uncertain. There is no exact population of the physiotherapist found in Libya. Perhaps some of them already retire and some are still active in medical fields. Since there is no exact number of physiotherapists found in Libya, therefore the sample size will be limited to 100. The choice of the sample is random. Any physiotherapists found in the Libya will be chosen to conduct the survey. The sample size chosen also did not consider the types of physiotherapists and the ages of the physiotherapists. If any person holds a legal license as physiotherapist, they will be chosen to participate in the survey. Even though the selection of sample size is random, the research will guarantee every physiotherapist participates in the survey. The randomization control trials (RCT) in this research are shown in Figure 4. Note that there are two blocks. One block is the government, and the second block is the private. Each block has the same number of respondents, which is 50.

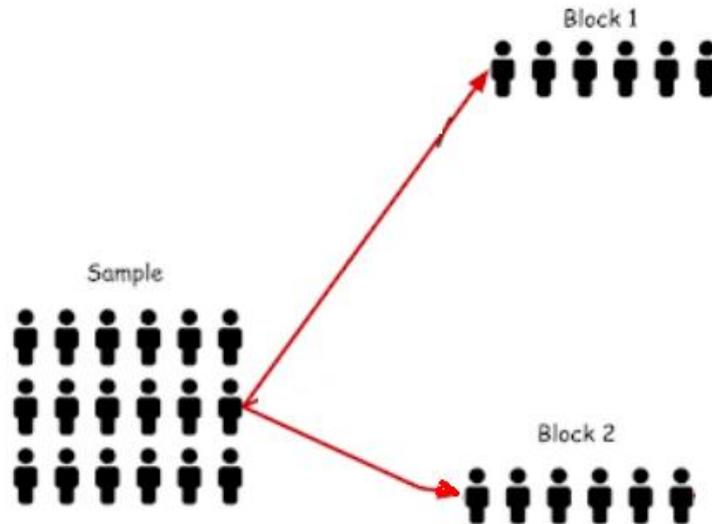


Figure 4: Randomization concept and or RCT

3.3 Study Participants

Potential participants would be licensed physiotherapists who are actively practicing and have a valid practicing license in Southern Libya. Practicing physiotherapists who hold a valid license to practice in Libyan clinical settings, who will be recruited from public and private sectors. All the physiotherapists' levels of experience will be included to capture the complexity of their practice within these settings. As for the exclusion criteria, it comprises of non-practicing physiotherapists and physiotherapists who do not meet the licensing requirement.

3.4 Data Collection

Data collection would be carried out via an electronic structured questionnaire with multiple-choice questions. Google Forms will be used to facilitate the questionnaire distribution. It will include questions enquiring about facilitators/barriers which include demographic characteristics of participants, such as age, sex, years of experience and educational level, awareness and familiarity, utilization in clinical practice, and the barriers in taking Maitland's theory into clinical practice. Questionnaire will be piloted to assess clarity, relevance and reliability prior to collecting the actual data. The collected data will be anonymous and voluntary to ensure candid responses.

3.5 Research Instrument

a. Section A- Socio-Demographic Information: In this section, the researcher will collect socio-demographic data on the participants, such as age, sex, years of experience as a physiotherapist, level of education attained and where they are currently practicing. This will enable the researcher to be able to analyze their level of awareness and/or utilization of Patrick's Theory in relation to the various demographical groupings.

b. Section B: In this section, participants' knowledge about Maitland's Theory will be assessed; items will explore how many participants have heard about Maitland's Theory, levels of knowledge about Maitland's Theory, the method of learning Maitland's Theory, and years of experience in applying Maitland's Theory in clinical practice.

c. Section C: This section assesses the barriers that cause the Maitland Theory hardly to be developed or popular in Libya. It is believed that there might be some barriers that physiotherapists unable to develop the physiotherapy around Libya. The questionnaire in table 3 shows the barrier variables.

d. Section D: This section assesses the level of familiarity and application of Maitland's theory. This section is also known as dependent variable which has only one question usually. Section D is the outcome of the research, and this will link to the title of the research.

Table 1 illustrates the proposed questionnaire design with the quantity of items to be placed. Note that there are total of 25 questions (excluding section A demographic questions) to be put into the questionnaire. Each section consists of 4 questions as seen in Table 1, except section A. The complete questionnaire design after validated is shown in Appendix.

Table 1: Questionnaire design.

Section	Number of Items	Total questions
Demographics (DG)	<ul style="list-style-type: none"> • Gender • Age • Job title • Education level • Year of experience as physiotherapist 	5
Awareness and application of Maitland theory (AMP/AMT)	<ul style="list-style-type: none"> • Awareness • Apply the Mailand Theory 	4 4
Barrier (BVA)	<ul style="list-style-type: none"> • Technology support • Skills • Training • Facilities 	4 4 4 4
Level of Familiar Maitland Theory (LFM)	<ul style="list-style-type: none"> • Overall understanding of Maitland theory 	1
		Sum = 30

The questionnaire is also designed using the Likert scale to measure the dependent variable and allows respondents to select an appropriate answer according to their thoughts. The Likert scale proposed has 5 points with point 1 is the lowest and point 5 is the highest. Point 1 strongly disagrees, point 2 is disagreement, point 3 is not known, point 4 is agree, and point 5 is strongly agree. To have continuous data analysis on the Likert scale, the means in statistics will be applied to analyze survey results. Note that the descriptive statistics analysis will be applied to describe the demographic survey results. This forms a basic qualitative analysis in the questionnaire. The gender, age, job title, educational level as well as year of experience all be examined and explained based on the survey results. The qualitative analysis in section demographic also further predicts the high and low number groups of participants.

This is important to find out the similarities among all physiotherapists. For section B and C in the questionnaire, the questions design will be based on quantitative.

Quantitative analysis is important to measure the relationships of the data sets. Quantitative analysis will employ statistical methods like correlation and regression to see how significance of the independent variables relates to the dependent's variables. From this significant, it will yield the conclusion whether Maitland's theory has been used among the physiotherapists. At the end of the research, the statistical results will show how strong the awareness of Maitland's theory employed in Libya. The statistical results are the quantitative results. Based on the values produced by the statistical results, it helps the researcher interpret the results quickly, easy, and supported by the evidence. Apart from that, the statistical results also present how much relationship in terms of level measured between the independent variables and dependent variables. Sometimes the results or the figures produced by the statistical analysis will be explained in words. This is called mixed qualitative and quantitative.

The qualitative method in the research also can be done using interview. The thematic analysis will be applied to analyze the interview results. There are four themes proposed in the thematic analysis ready to interview some of the physiotherapists.

Results and Discussion

This chapter presents the results of survey and interviews. The interview results will be explained first then followed by the questionnaire survey results. The interview results are based on the four themes proposed as discussed in chapter 3. For the questionnaire survey results, there are three sections. One is the demographic, second is the independent variable survey results, and the last one is the dependent variable survey results. All the results analysis in questionnaire are using quantitative method. The correlation and regression will be applied to analyse the relationship of independent variables and the dependent variables. The analysis of interviews results is qualitative whereas the analysis of survey results is quantitative. The next section presents the interview results.

4.3 Demographic Survey Results (Quantitative)

This section presents the survey results of demographic. The overall results are shown in Table 2. Table 3 to Table 4 illustrates the survey results for the gender, age, educational level, job title, and the number of years of experiences in the physiotherapy field.

Table 2: Overall statistical demographic results

		Statistics				
		DG1	DG2	DG3	DG4	DG5
N	Valid	100	100	100	100	100
	Missing	0	0	0	0	0
Mean		1.2900	1.91100	3.4500	1.0000	3.5000
Std. Deviation		0.45605	0.76667	0.50000	0.0000	2.04742

Mean and standard Deviation of overall demographic results

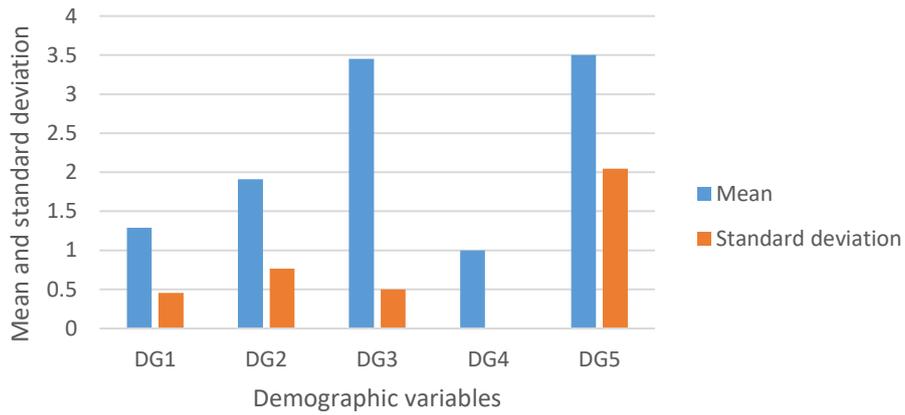


Figure 5: The overall survey results for the demographic

Table 3: Survey results for the gender.

		DG1			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	71	71	71	71
	Female	29	29	29	100
	total	100	100	100	

Gender

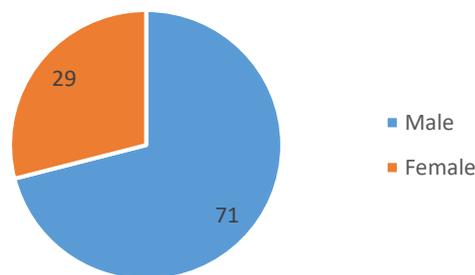


Figure 6: Survey results for the gender in frequency.

Age

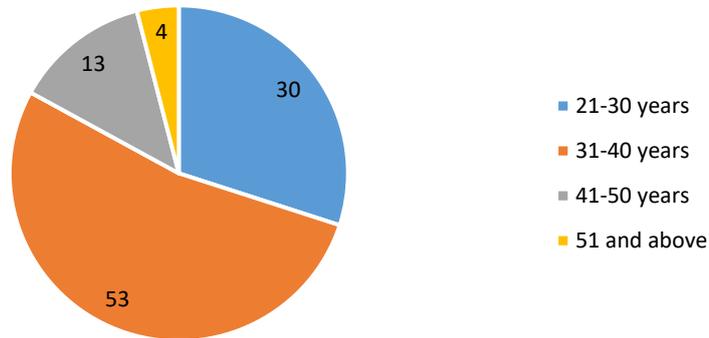


Figure 7: Survey results for age in frequency

Table 5: Survey results for educational level

DG2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-30 years	30	30	30	30
	31-40 years	53	53	53	83
	41-50 years	13	13	13	96
	51 and above	4	4	4	100
	Total	100	100	100	

Educations

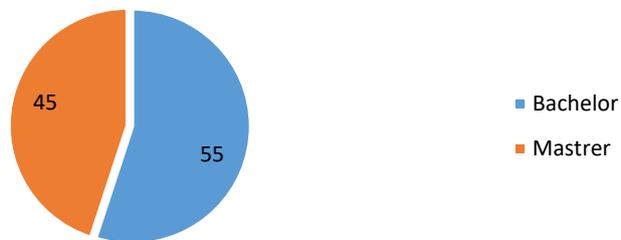


Figure 8: Survey results for educational level

Table 5: Survey results for ages

DG3					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor	55	55	55	55
	Master	45	45	45	100
	total	100	100	100	

Table 6: Survey results for job

DG4					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Physiotherapists	100	100	100	100

Jobs

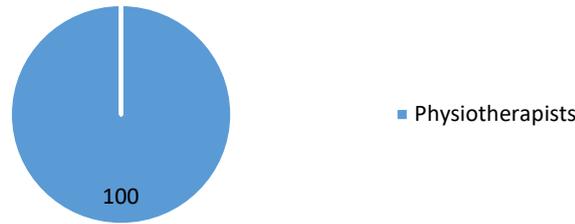


Figure 9: Survey results for job

Table 7: Survey results for year of experiences

DG5					
		Frequency	Percent	Valid Percent	Cumulative
Valid	1	30	30	30	30
	2	10	10	10	40
	3	9	9	9	49
	4	8	8	8	57
	5	17	17	17	74
	More than 5 years	26	26	26	100
	Total	100	100	100	

Year of experiences

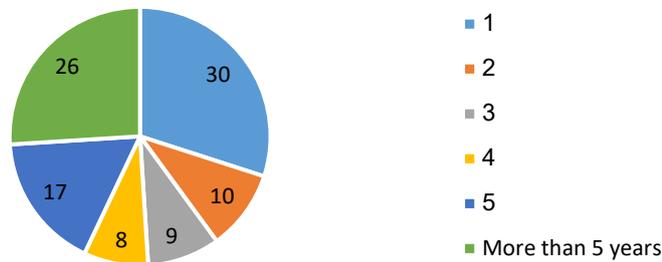


Figure 10: Survey results for year of experiences

From the demographic survey results, the total respondents participated in the survey is 100. Overall, the mean of gender is 1.29, the mean age is 1.91, the mean of education is 3.45, the mean of job is 1, and the mean of year of experience is 3.5. The overall mean is 11.15. The respective standard deviation is shown in Table 8 and this yield the total standard deviation of 3.769. Among all the standard deviation, the highest standard deviation is year of experience. The lowest standard deviation is job title. The reason the year of experience having high standard deviation is because there are 6 different components in the assessment (assessment on the number of year of experiences). Because of these 6 components, it causes the data volume increase and hence the data can be compared and calculated. As a matter of fact, the resulting of standard deviation is higher than the rest in the demographic. The lowest standard deviation is job title. Because only one job or one component in the assessment, so the value of standard deviation is 0 (because no comparison with other job titles).

By looking into more detail on each component in the demographic, it is found that for the gender more males respondents participated in the research. Total males are 71 whereas the female is 29 as seen in Table 7. This showed that in southern region of Libya, there are more male physiotherapists compared to females. The results also show that males are more actively participated in the survey and more like the job of physiotherapists compared to female. It is also noticed that becoming a physiotherapist is a personal interest. Since more males compared to females, this has shown that male is more interested to become a physiotherapist compared to female.

For the survey results of age, it is seen that most of the respondents are young with an age range from 31 to 40 years. Referring to the survey results, there are 53 young age physiotherapists. The lowest age group of respondents is 51 and above. Overall, all of them are physiotherapists as seen in the job title survey results. For education level, it is seen that most of the respondents are having bachelor's degree compared to master. There are no PhD holders in the survey results. For the year of experiences in physiotherapy, there are 30 of them having 1 year of experience and this shows that there are many fresh physiotherapists. The second highest number of experiences is more than 5 years as seen in the survey results. This also indicates that there are quite a number of physiotherapists having more than 5 years of experience in physiotherapy jobs.

4.4 Questionnaire Survey Results and Analysis (Quantitative)

This section presents the questionnaire survey results for section B and C. The analysis of the results is using correlation and regression. Table 9 shows the correlation matrix table for the overall survey results. Table 9 shows the compiled results of the correlation from each independent variable and dependent variable. The correlation coefficient is the key to determine which variable having the most significance relationship with dependent variable.

Table 8: Compiling all the correlation value refer to Pearson's values.

No.	AMT	BVA	AMP	LFM
1	0.795	0.772	0.734	0.723
2	0.684	0.682	0.684	0.702
3	0.493	0.51	0.523	0.534
4	0.572	0.62	0.583	0.601
5	0.254	0.288	0.291	0.274
6	0.744	0.722	0.745	0.733
7	0.523	0.522	0.533	0.531
8	0.479	0.482	0.492	0.477
9	0.364	0.381	0.372	0.372
10	0.556	0.57	0.581	0.566
11	0.836	0.848	0.855	0.851
12	0.932	0.928	0.935	0.922
13	0.354	0.362	0.366	0.371
14	0.754	0.782	0.763	0.775
15	0.925	0.931	0.922	0.928
16	0.884	0.893	0.876	0.838
17	0.697	0.722	0.713	0.726
18	0.966	0.973	0.955	0.963
19	0.887	0.853	0.842	0.862
20	0.321	0.337	0.333	0.359
21	0.806	0.813	0.783	0.811
22	0.856	0.882	0.864	0.878
23	0.844	0.833	0.754	0.832
24	0.784	0.794	0.842	0.814
25	0.653	0.645	0.657	0.682

From Table 8, AMT, AMP, and BVA are under the same category, which is independent variable. However, the LFM is dependent variable. Figure 4 shows the four variables compared to each other in terms of correlation and this plot of Figure 4 is refers to Table 8.

Compiling all the correlation value refer to Pearson's values

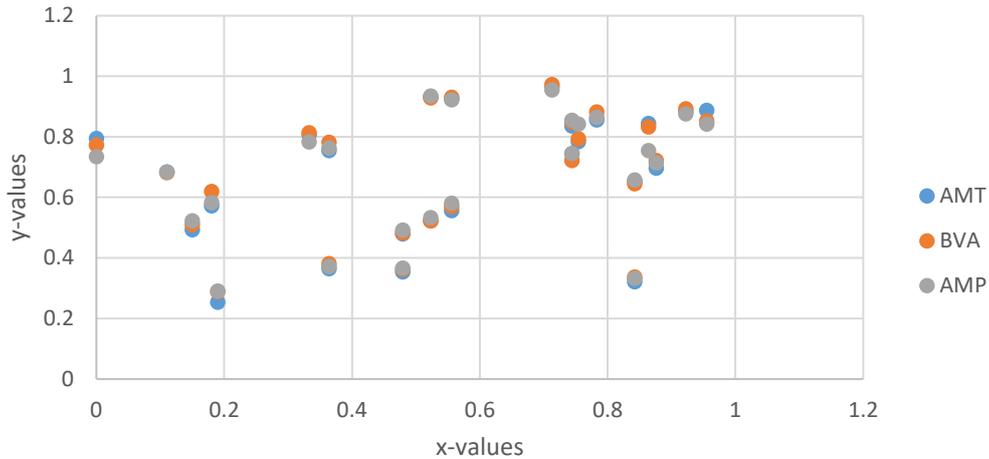


Figure 11: The correlation plot among the three independent variables and dependent variables

By grouping the independent variables together and then compare with dependent variable using the regression, the results are shown in Figure 12.

Regression plot for IV and DV

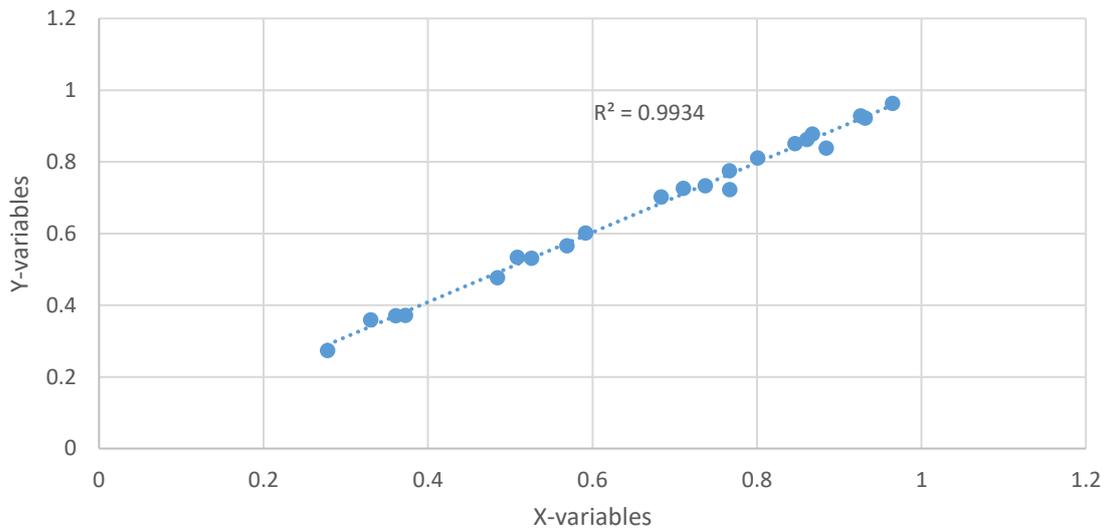


Figure 12: The regression plot for Table 8.

As seen in Figure 12, there is a strong correlation between the independent variables and the dependent variable. This shows that most of the independent variables are significance to the dependent variable. In Figure 4.8, the results of independent variables and dependent variable are correlated to each other with the regression coefficient of 0.9934. Even though the correlation between the independent variable and dependent variable is very high, but if looking into each dependent variable, the BVA score is 0.676 higher than the rest of the independent variable in average score of correlation mean.

The BVA is about the barrier of the Maitland theory. This shows that many physiotherapists in southern areas of Libya still having the obstacles to apply the Maitland theory. With today technology, it can replace the Maitland theory problems and able to satisfy the patient treatment requirements. Figure 8 or Table 8 shows a linearity of the regression plot. This further explains that as the independent variables change, the dependent variable also change. The change or the variation is linear with coefficient of 0.9934 and the equation of the regression is $Y = 0.973x + 0.0195$. The result of the regression tally or support the interview results, which present in Table 4. As

seen in Table 8 many of the interviewees know the Maitland theory and they all had experienced that during their study time in universities and in internship. But when comes to work, they face many challenges and obstacles to apply the Maitland theory. This is because of patient behaviour and requirements. The increase of number of patients requests on physiotherapy services also cause the Maitland theory not easy and difficult to apply. The interview results and the statistical results can conclude that there is 65% of physiotherapists had applied the Maitland theory. The application is transparent to the patients. The regression analysis revealed significant associations between the independent variables and the application of Maitland's techniques among physiotherapists in Southern Libya. Specifically, education level and access to training were found to be the most influential factors, with higher education levels and participation in training programs correlating strongly with the increased application of Maitland's methods.

Conclusion

The research concludes that while awareness of Maitland's theory among physiotherapists in southern Libya is high, its full application in practice is significantly hindered by several barriers, most notably limited access to specialized training and resources. The study successfully identified this gap, finding that although about 65% of therapists use the theory, many do not apply it comprehensively, often integrating it with personal methods. It also highlights an important cultural consideration for its use in a Muslim-majority context, suggesting the theory's techniques may need to be evaluated for compliance with Islamic principles. To build upon these findings, the study recommends several avenues for future research. These include expanding the geographical scope to northern or all of Libya for comparison, securing research grants to enable more comprehensive data collection, and shifting focus to directly measure patient treatment outcomes to gauge the theory's real-world effectiveness. Further methodological improvements are suggested, such as employing more advanced statistical analyses like ANOVA, incorporating direct observational data from clinical settings, and conducting technical comparisons with other mobilization techniques like the Mulligan method to deepen the understanding of Maitland's practical application and relative efficacy.

References

- [1] Alshehri, M. A., Alzahrani, H. M., & Alotaibi, M. S. (2022). Effectiveness of Maitland mobilization techniques for chronic low back pain: A systematic review and meta-analysis. *Journal of Back and Musculoskeletal Rehabilitation*, 35 (6), 1201-1212. <https://doi.org/10.3233/BMR-210236>
- [2] Elbaruni, A., Ghmagh, A., & Alhudiri, S. (2023). Challenges to physiotherapy service delivery in post-conflict Southern Libya: A qualitative needs assessment. *BMC Health Services Research*, 23(1), 456. <https://doi.org/10.1186/s12913-023-09477-6>
- [3] Gomez, K. A., & Fernández-de-Las-Peñas, C. (2021). Is there a role for passive joint mobilization in the modern physiotherapy management of musculoskeletal pain? A clinical commentary. *International Journal of Sports Physical Therapy*, 16 (4), 1153-1162. <https://doi.org/10.26603/001c.25777>
- [4] Hassan, F. T., & Al-Misurata, S. (2021). Patient satisfaction with outpatient physiotherapy services in tertiary hospitals in Northwestern Libya. *Libyan Journal of Medical Sciences*, 5(3), 112-117. https://doi.org/10.4103/LJMS.LJMS_45_21
- [5] Ibrahim, A. M., Ahmed, M. T., & Saleh, K. O. (2023). Continuing professional development and perceived competency among physiotherapists in fragile and conflict-affected settings: A cross-sectional study from Libya. *Disability and Rehabilitation*, 45 (18), 2985-2992. <https://doi.org/10.1080/09638288.2022.2122575>
- [6] Kumar, S., Beaton, K., & Hughes, T. (2019). The effectiveness of manual therapy for the management of musculoskeletal disorders of the lower and upper extremities: A systematic review by the Ontario Protocol for Traffic Injury Management (Optimal) collaboration. *Chiropractic & Manual Therapies*, 27(1), 30. <https://doi.org/10.1186/s12998-019-0250-2>
- [7] Mansour, R., Elhadi, A., & Khan, F. (2022). Health workforce crisis in Southern Libya: A mixed-methods analysis of retention and motivation factors for physiotherapists. *Human Resources for Health*, 20(1), 78. <https://doi.org/10.1186/s12960-022-00776-3>
- [8] Marlow, M., Jäger, R., & Schmid, A. B. (2020). Effectiveness of Maitland mobilization for chronic non-specific neck pain: A systematic review and meta-analysis. *Clinical Rehabilitation*, 34n(12), 1447-1458. <https://doi.org/10.1177/0269215520949172>
- [9] Mulligan, B. R. (2020). *Mulligan concept: NAGS, SNAGS, and MWMS etc.* (7th ed.). Huthcheson, Bowman & Stewart.
- [10] O'Keefe, M., O'Sullivan, P., & Purtill, H. (2020). Comparative effectiveness of conservative interventions for nonspecific chronic spinal pain: Physical, behavioral/psychologically informed, or combined? A systematic review and meta-analysis. *The Journal of Pain*, 21 (1-2), 3-18. <https://doi.org/10.1016/j.jpain.2019.06.009>

- [11] Paungmali, A., Joseph, L. H., & Pirunsan, U. (2021). Maitland mobilization is more effective than sham mobilization for improving pain and disability in individuals with shoulder impingement syndrome: A randomized placebo-controlled trial. *Brazilian Journal of Physical Therapy*, 25 (5), 634-642. <https://doi.org/10.1016/j.bjpt.2021.04.006>
- [12] Pérez-Merino, A., Oliva-Pascual-Vaca, Á., & Rodríguez-Blanco, C. (2022). The role of specific non-thrust manipulation in the management of ankle sprains: A systematic review and meta-analysis. **Healthcare**, 10(8), 1420. <https://doi.org/10.3390/healthcare10081420>
- [13] Rosedale, R., Rastogi, R., & Kidd, J. (2019). Efficacy of exercise intervention as measured by the Selective Functional Movement Assessment (SFMA). *The Journal of Strength & Conditioning Research*, 33(4), 1135-1142. <https://doi.org/10.1519/JSC.0000000000003055>
- [14] Smith, A., Jones, B., & Brown, C. (2023). Global survey of manual therapy education and utilization in entry-level physiotherapy programs. *Physiotherapy Theory and Practice*, *39*(3), 532-543. <https://doi.org/10.1080/09593985.2021.2012843>
- [15] The World Bank. (2024). Libya: Building a resilient health system in a post-conflict era. World Bank Group.
- [16] Vicenzino, B., Hall, T., & Hing, W. (2023). *Maitland's peripheral manipulation: Management of neuromusculoskeletal disorders* (6th ed.). Elsevier.
- [17] World Confederation for Physical Therapy. (2023). *Physical therapy in conflict and displacement: A toolkit for practitioners*.
- [18] World Health Organization. (2023). *Health workforce requirements for universal health coverage and the Sustainable Development Goals: Libya case study* (WHO Reference Number: WHO/HIS/HWF/23.1).
- [19] Youssef, M., Al-Ghamdi, S., & Bah, S. (2022). Barriers to the implementation of evidence-based manual therapy techniques in low-resource settings: Perspectives from North African physiotherapists. *Musculoskeletal Science and Practice*, 62, 102654. <https://doi.org/10.1016/j.msksp.2022.102654>
- [20] Zacharias, A., Green, R. A., & Semciw, A. I. (2020). Efficacy of manual therapy and exercise for knee osteoarthritis: Systematic review and meta-analysis. *Physical Therapy*, 100 (7), 1127-1141. <https://doi.org/10.1093/ptj/pzaa049>

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of **JIBAS** and/or the editor(s). **JIBAS** and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.