African Journal of Biological Sciences

Journal homepage: http://www.afjbs.com

Research Paper   Open Access

Validity and Reliability of Arabic Version of Tampa Scale for Kinesiophobia for Patients Following Breast Cancer Surgeries

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ABSTRACT

Background: Breast cancer survivors may experience upper extremity pain, numbness, limited shoulder range of motion, and a risk of lymphedema, which can cause them to develop kinesiophobia—a fear of movement and avoidance of physical activity. Self-administered questionnaires are increasingly being utilized as an assessment tool in clinical practice and research, serving as standardized techniques for measuring results. **Purpose:** this study was conducted with the aim of translating in addition to test content validity, internal consistency reliability, test-retest reliability as well as feasibility of the Arabic version of Tampa scale for kinesiophobia for patients following breast cancer surgeries. **Methodology:** expert panel (consist of ten experts) and 86 patients had a breast cancer related surgery participated in this study, 172 sheets were filled included the sheets of test and re-test sheets. The process involved forward translation, creating an initial translated version, followed by backward translation. Specialists then worked on and tested the pre-final version. Finally, the final version was tested on patients. A number of statistical tools were employed in the analysis, including the following: expert proportion of relevance, descriptive statistics, time needed to complete out the questionnaire, Cronbach's alpha, intraclass correlation coefficient, index of content validity, and missed item index. **Results:** The study found that the scale CVI (S-CVI) was 0.95%, the proportion of relevance determined by experts was 94.12%, Cronbach's alpha for the Arabic version of TSK was 0.712, and the ICC for the whole score was 0.931, with a 95% confidence interval of 0.892-0.955.All sheets had a 100% completion rate for the scale items, with an average completion time of 3.42 ± 1.07 minutes. The maximum completion time was 6 minutes, while the minimum was 1 minute. **Conclusion:** Arabic-language version of the **TSK** has adequate content validity, feasibility, internal consistency as well as test-retest reliability to measure kinesiophobia among patients following breast cancer surgeries.

Keywords: Feasibility –Reliability –Tampa Scale for Kinesiophobia –Validity.

Introduction

Cancer is a persistent and non-transmissible disease that encompasses a broad spectrum of disorders. This condition, like other chronic diseases, **It can affect people of all ages and races, posing a substantial health challenge that impacts the overall well-being of society (Banegas et al., 2012).**

Based on the GLOBOCAN 2020 data, breast cancer is presently a highly prevalent disease and is the fifth most common cause of cancer-related deaths. There is an estimated global incidence of 2.3 million new instances of breast cancer, leading to 685,000 fatalities **(Łukasiewicz et al., 2021).**

The primary treatments for breast cancer include surgery, adjuvant radiation, chemotherapy, endocrine therapy, in addition to targeted therapy (Zaidi et al., 2018).

Individuals who survived breast cancer may encounter additional symptoms such as pain, tiredness, and psychological distress. In addition, they may also encounter alterations in the functionality of their upper limbs or develop kinesiophobia, which is defined as a fear of movement. Furthermore, there are some risk factors that contribute to the development of chronic pain because of surgical problems **(Bjerkeset et al., 2020).**

Kinesiophobia is observed in individuals experiencing chronic pain, especially breast cancer survivors. This condition is associated with an elevated risk of lymphedema, depression, as well as anxiety, while also impairing upper limb function **(Gencay et al., 2018).**

Pain-related fear avoidance is a prevalent issue in patients experiencing pain, which can result in the avoidance of activities, excessive vigilance, and even depression, physical inactivity, loss of physical fitness, and impairment in individuals with cancer **(Crombez et al., 2012)**

An effective questionnaire can assess the prognosis of the problem and the impact of treatment (report pain and function). It can also reveal a patient's condition's severity, irritation, and a nature of the patient's condition **(Maxwell et al., 2021).**

Although subjective, self-administered questionnaires are standardized and responsive to clinical changes, which may remove bias. Any new evaluation instrument that is used in research must be valid as well as reliable to reduce study bias **(Kimberlin and Winterstein, 2008).**

Research has demonstrated that the TSK is a major predictor of suffering, disability, and perseverance with behavioral tasks like weightlifting and aerobic activity in individuals with pain. Evidence suggests that the fear associated with pain is more debilitating than the pain itself **(Vlaeyen et al., 1995; Crombez et al., 1999).**

The Tampa Scale for Kinesiophobia (TKS) has been validated and culturally adapted for use in various languages, including English**,** in original version by (**Miller et al., 1991**) followed by verification from other English-speakers' organizations (**Clark, 1996; Cook et al., 2006; French et al., 2007; Woby et al., 2005**), Dutch language by **(Valeyen et al., 1995; Roelofs et al., 2007**), Swedish language by **(Roelofs et al., 2007**),Turkish language by (**Yavuz Yakut et al., 2011**), Spanish language by (**Gomez- Perez et al., 2011**)**.,** German language by (**Rusu et al., 2014**), Arabic language by (**Juweid et al., 2015**), Gujarati language by (**Bid et.al., 2018**), Chinese language by (**Wei et al., 2015**), Japanese language by (**Matsudaira et al., 2013**)**,** Brazilian language by (**De Souza et al., 2008**), Italian language by (**Monticone et al., 2010**) and Norwegian language by (**Haugen et al., 2008**).

Valid, practical, and reliable instruments are employed in physical therapy to determine the patient's condition improvement and gauge particular therapeutic benefits. The valid tool must be connected and have a good face, content, criterion, as well as construct validity **(Holden, 2010).** A good feasibility tool seeks to identify the advantages and disadvantages of a current assessment instrument rationally and objectively **(Georgakellos and Marcis, 2009).** Good equivalence, stability, and internal consistency are essential for a reliable tool **(Heale and Twycross, 2015).**

MATERIALS AND METHODS:
1. **Design of the Study**
This research employed a prospective observational design.

2. Participants and sample size
This research was conducted in Dar El-Salam Cancer Hospital (Harmal) Cairo, Egypt to assess the content validity, feasibility, internal consistency reliability, as well as test-retest reliability for the Arabic-language version of the Tampa Scale for Kinesiophobia for patients following breast cancer surgeries.
The research protocol received approval from the Ethical Committee Review Board of the Faculty of Physical Therapy (No:P.T.REC/012/004319) and the Ethical Committee Review Board of the Ministry of Health and Population (Com.No/Dec. No: 20-2023/14)
This study adhered to the guidelines suggested by **Borsa et al. (2012)** (17) and **Sousa and Rojjanasrirat, (2011)** (18) for assessing validity, reliability.
The study involved **86** female participants aged between 40 and 60 years, all of whom were literate in Arabic and had undergone breast cancer surgery.We did not include patients who had a history of inflammatory arthropathy prior to their primary breast cancer treatment, recurrent cancer or metastasis episodes, shoulder fractures or dislocations, whiplash trauma, cervical radiculopathy, neurological disorders, or severe chronic diseases such as rheumatoid arthritis, multiple sclerosis, heart failure, or neurological disorders. The study's expert panel consisted of ten individuals, all of whom had either a master's degree or ten years of relevant work experience. These experts mostly worked with Arabic individuals and possess fluency in both English and Arabic.
3. Study stages:
The procedure for translating and adapting the Tampa Scale for kinesiophobia into Arabic was outlined by **Sousa and Rojjanasrirat, (2011).**

3.1- Forward translation:
 Arabic translation of Scale (forward translation or as one-way translation) Two Arabic translations of an English language scale were utilized, namely Ar1 and Ar2.
3.2- Creation of the initial draft of the translated Arabic version:
 a) The investigators conducted a comparative analysis and integration of the 2 versions, Ar l and Ar 2. b) Rectifying linguistic flaws as well as inaccuracies in the Arabic language. C) The initial version was then translated into Arabic.
3.3- Blind back-translation of the questionnaire:
 a) Through the use of back translation, 2 different questionnaire formats were developed (En1 & En2) b) The back translation process was conducted by 2 translators, each possessing unique experiences C) One translator possessed a profound understanding of English health terminology and the technical aspects of the tool, whilst the other had expertise in the idiosyncrasies of the English language from a linguistic and cultural perspective.
3.4- compare the two forms of the scale that were translated backwards (En1 & En2).
 The investigators conducted a comparison between the back-translated versions of En1 & En2, as well as a comparison between both En1 & En2 with the integrated form of the questionnaire. The evaluators assessed numerous aspects including instructions, items, response format, wording sentence structure, meaning, as well as relevance. Based on their analysis, no adjustments were deemed necessary. Therefore, the preliminary initial translated Arabic version is now considered to be the pre-final Arabic version of the questionnaire.
3.5- The assessment of content validity for the pre final version
 For the pre-final Arabic version of the questionnaires, we asked ten specialists to rate each item on a specified scale based on its content equivalency (content-related validity): a) Irrelevant; b) Inability to evaluate relevance; c) Relevant, but needs slight modifications; 4:

Highly concise as well as relevant, also, provides recommendations to enhance its relevance (a &b deemed irrelevant, c &d deemed relevant). After successfully completing expert content validity testing, the pre-final version was officially certified as the final Arabic Version.

5.6- Conduct the psychometric assessment of the pre final version

The final version of the Arabic scale was administered to 86 female patients who underwent surgery for breast cancer. 172 data collection sheets were completed by the patients, including test-retest sheets. Feasibility was determined by assessing the duration of administration as well as the number of missed answers per question. The patients underwent the re-test process three days later.

Statistical analysis

For numerical data, descriptive statistics were applied by utilizing means as well as standard deviations. For categorical data, frequency as well as percentage were used. Considering this purpose, we used the expert proportion of relevance, scale content validity indices (S-CVI), as well as index of content validity (CVI). Cronbach's alpha was utilized to assess the reliability of internal consistency. The test-retest reliability was assessed via the intraclass correlation coefficient (ICC). Feasibility is evaluated by computing the missed item index as well as the average time needed to respond to the questionnaire. The statistical tests were conducted with a predetermined level of significance of $p < 0.05$. The statistical analysis was performed using the SPSS software, version 25 for Windows, developed by IBM SPSS in Chicago, IL, USA.

Results

Subject characteristics:

A total of 86 female patients who underwent breast cancer surgery were included in this study. Their mean ± SD age, weight, height and BMI were 50.33 ± 7.35 years, 71.80 ± 15.38 kg, 159.62 ± 6.62 cm and 28.19 ± 5.97 kg/m² respectively. 39 (45.35%) of subjects had modified radical mastectomy, 11 (12.79%) simple mastectomy and 36 (41.86%) had lumpectomy.

The pain distribution within subjects showed that 32 (37.2%) subjects had mid pain, 43 (50%) had moderate pain and 11 (12.8%) had sever pain. 58 (67.4%) of the subjects had jobs while 28 (32.6%) are not working (Table 1).

Table 1. *General characteristics of the subjects.*

	Mean ±SD	**Minimum**	**Maximum**
Age (years)	50.33 ± 7.35	40	60
Weight(kg)	71.80 ± 15.38	44	118
Height (cm)	159.62 ± 6.62	145	174
BMI (kg/m²)	28.19 ± 5.97	19.03	49.78
	N	**%**	
Type of surgery			
Modified Radical Mastectomy	39	45.35	
Simple mastectomy	11	12.79	
Lumpectomy	36	41.86	
Pain			
Mild	32	37.2	
Moderate	43	50	
Sever	11	12.8	
Work			
Yes	58	67.4	
No	28	32.6	

SD, standard deviation

Content validity:

For the purpose of assessing the content validity of the Arabic version of the TSK, a group of 10 experts took part in this study. There was a total of 7 professionals in the field of physiotherapy and 3 experts in the field of surgery. The expert panel's mean experience years (± SD) was 18.4 ± 6.85 years, ranging from a minimum of 10 years to a maximum of 35 years.

The content validity index (S-CVI) for the Arabic version of TSK was 0.95, indicating excellent reliability and validity. (Table 1) The I-CVI values were between 0.8 and 1. The mean expert proportion of relevance was 94.12%, indicating an exceptional level of accuracy. The proportion of relevance varied from 76.47% to 94.12% among the five experts, and five experts got a 100% proportion.

Table 1. *Item index of content validity of the final version of the Arabic version of TSK:*

	(relevant responses)	No. of experts that agree.	I-CVI
Item 1	10		1
Item 2	10		1
Item 3	9		0.9
Item 4	10		1
Item 5	9		0.9
Item 6	9		0.9
Item 7	10		1
Item 8	10		1
Item 9	10		1
Item 10	10		1
Item 11	9		0.9
Item 12	8		0.8
Item 13	10		1
Item 14	9		0.9
Item 15	10		1
Item 16	9		0.9
Item 17	10		1
	S-CVI		**0.95**

Reliability:

Internal consistency of the Arabic version of TSK:

The internal consistency of the Arabic version of TSK was determined to be acceptable with a Cronbach's alpha of 0.712.

- Test-retest reliability of the Arabic version of TSK:

The Arabic version of the TSK scale demonstrated strong test-retest reliability across all items, with ICC values ranging from 0.77 to 0.971. The ICC for the overall score was 0.931, with a 95%, CI of 0.892-0.955 (Table 3)

Table 3. *Test-retest reliability of Arabic version of TSK:*

TSK	ICC	(95% CI)		P value
		Lower bound	Upper bound	
Item 1	0.882	0.820	0.923	0.001
Item 2	0.916	0.870	0.945	0.001
Item 3	0.86	0.785	0.908	0.001
Item 4	0.971	0.953	0.982	0.001
Item 5	0.924	0.883	0.950	0.001
Item 6	0.876	0.810	0.919	0.001
Item 7	0.791	0.671	0.867	0.001
Item 8	0.916	0.871	0.945	0.001

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Item 9	0.771	0.649	0.851	0.001
Item 10	0.855	0.778	0.906	0.001
Item 11	0.842	0.758	0.897	0.001
Item 12	0.854	0.776	0.905	0.001
Item 13	0.838	0.751	0.894	0.001
Item 14	0.770	0.601	0.861	0.001
Item 15	0.889	0.823	0.929	0.001
Item 16	0.81	0.708	0.876	0.001
Item 17	0.782	0.620	0.869	0.001
Total score	0.931	0.892	0.955	0.001

ICC, Intraclass correlation coefficient value; CI, Confidence Interval; P value, Probability value

Feasibility:

The TSK took 3.42 ± 1.07 minutes on average, with a minimum of 1 minute and a maximum of 6 minutes to complete. No items were absent. Table 4 displays the frequency and percentage of minutes needed to finish the scale.

Table 4. *Frequency distribution of time needed to complete the TSK in minutes:*

Time (min)	Frequency	Percent
1	2	2.3
2	13	15.1
3	33	38.4
4	27	31.4
5	7	8.1
6	4	4.7
Average	**3.42 ± 1.07**	

DISCUSSION

Research on the impact of psychosocial factors indicates that the two primary indicators of disability, when compared to pain duration and intensity, are kinesiophobia (fear of movement) as well as catastrophizing (an exaggerated negative mental set during a painful experience, whether real or anticipated). Higher levels of kinesiophobia at the beginning were found to be a predictor of increased impairment over time in patients suffering chronic musculoskeletal pain **(Van der Gucht et al., 2020).**

In a study conducted by **Mogahed et al. (2020)**, the application of an 8-week combined intervention involving Cyriax soft tissue release and proprioceptive neuromuscular facilitation (PNF) on glenohumeral rhythm in post-mastectomy adhesive capsulitis resulted in significant improvements ($P < 0.05$) in range of motion (ROM) and reduced fear associated with performing movements. These positive effects were observed in the experimental group when compared to the control group.

It is crucial to remember that translating a scale or questionnaire into another language does not guarantee that the translation is equally reliable and valid as the original. It is crucial to assess the validity as well as reliability of the translation **(Hambleton, 2004).**

Validity of the Translated Arabic Version of TSK

The study effectively documented the process of translating and adapting the TSK questionnaire into Arabic and conducted thorough studies to evaluate its psychometric properties. The results indicated that the translated TSK exhibited high content validity, with an S-ICV value of 0.95% with a mean proportion of relevance of 94.12%.

Results show that the scale's components are useful for measuring the functional impairment experienced by kinesiophobic patients after breast cancer procedures.

The present study's findings were consistent with **Polit and Beck (2006)** who stated that for a scale to be considered highly valid in terms of its content, it should have items with item indexes I-CVI that fulfill certain requirements, such as an I-CVI of 1.00 when dealing with 3 to 5 experts and a minimum I-CVI of.78 when dealing with six to ten experts. Furthermore, it is imperative that the scale possesses an S-CVI of 0.90 or above. If the initial assessment indicates that significant changes are required, there might be a need for two rounds of expert assessment for the suggested standards.

Furthermore, this finding aligns with the research conducted by **Waltz et al. (2005),** which established that an S-CV1/Ave index of 0.90 or higher is the minimum acceptable threshold. Any items that fail to meet this criterion should be revised then re-evaluated.

Feasibility of the Translated Arabic Version of TSK

The Arabic version of the Tampa scale for kinesiophobia shown excellent feasibility as all items were completed by 100% of participants across all sheets. Furthermore, it required less than 4 minutes to complete in about 87.2% of cases. The outcomes of the current study were in line with those of **Van et al. (2015)**, who asserted that a missing rate at the item level would be deemed acceptable as long as no individual item had a missing rate over 10%. Similarly, a completion time would be considered acceptable if 95% of the sheets were completed within a duration of 15 minutes or less.

Internal Consistency as well as Test Retest Reliability of the Translated Arabic Version of TSK

Three days after the test, the Arabic version of TSK had an acceptable Cronbach's alpha of 0.712 (0.615-0.794), indicating good internal consistency. Thus, an internal consistency rating between 0.7 and 0.9 is considered good by **George and Mallery (2003).**

The Arabic version of TSK demonstrated strong and consistent test-retest reliability across all items; ICC ranged from 0.77 to 0.971. ICC for the total score was 0.931, with 95% CI 0.892-0.955. ICC for item 1 was 0.882, with 95% CI 0.820-0.923. ICC for item 2 was 0.916, with 95% CI 0.870-0.945. ICC for item 3 was 0.86, with 95% CI 0.785-0.908. ICC for item 4 was 0.971, with 95% CI 0.953-0.982. ICC for item 5 was 0.924, with 95% CI 0.883-0.950. ICC for item 6 was 0.876, with 95% CI 0.810-0.919. ICC for item 7 was 0.791, with 95% CI 0.671-0.867. ICC for item 8 was 0.916, with 95% CI 0.871-0.945. ICC for item 9 was 0.771, with 95% CI 0.649-0.851. ICC for item 10 was 0.855, with 95% CI 0.778-0.906. ICC for item 11 was 0.842, with 95% CI 0.758-0.897. ICC for item 12 was 0.854, with 95% CI 0.776-0.905. ICC for item 13 was 0.838, with 95% CI 0.751-0.894. ICC for item 14 was 0.770, with 95% CI 0.601-0.861. ICC for item 15 was 0.889, with 95% CI 0.823-0.929. ICC for item 16 was 0.81, with 95% CI 0.708-0.876. ICC for item 17 was 0.782, with 95% CI 0.620-0.869.

Using Cronbach's alpha, ICC, and internal consistency to evaluate reliability, the Italian version of TSK yielded similar results. Demonstrated satisfactory internal consistency (Cronbach's alpha = 0.772) as well as strong test-retest reliability (ICC = 0.956). (**Monticone et al., 2010)**

Similarly, the Chinese version demonstrated exceptional internal consistency as well as test-retest reliability (Cronbach's alpha= 0.74). The ICCs indicated that the test-retest reliability (0.86, 0.77- 0.92) was excellent. **(Wei et al., 2015)**

The study found that the Japanese version of TSK demonstrated high test-retest reliability (ICC=0.90) as well as acceptable internal consistency (Cronbach's alpha = 0.79) among patients having ACL injuries **(Huang et al., 2019).**

The Swedish version of the scale, The ICCs were 0.91 and Cronbach's alpha = 0.81 (**Lundberg et al., 2004),** The Brazilian-Portuguese version the ICCs were 0.93 and Cronbach's alpha = 0.82 (**De Souza et al., 2008),** the German version exhibits a Cronbach's alpha of 0.73 for the whole scale. (**Rusu t al., 2014)** , and ICC reported for the Turkish , Finnish and the original English version of the scale (0.806 - 0.89 -0.84) (**Yilmaz et al., 2011; Koho et al., 2014; French et al., 2007)**

Bid et al. (2018), found that the Gujarati version of the questionnaire showed satisfactory internal consistency as well as moderate test-retest reliability (ICC = 0.696; Cronbach's alpha = 0.639). The outcomes closely aligned with the results of the recent investigation.

The process of translating, adapting, and validating an instrument for cross-cultural research typically requires many years and involves conducting multiple studies to ensure adherence to the suggested methodological procedures outlined above (**Sousa and Rojjanasrirat, 2011).**

A potential study may aim to initially translate, adapt, as well as cross-validate a research instrument by following translation processes and conducting pilot testing of the pre-final version of the instrument in the target language. This would involve cognitive debriefing with a monolingual sample. In a subsequent investigation, the researchers may focus on a single objective, which is to determine the initial psychometric properties of the translated instrument using subjects who are proficient in two languages. Next, in a third investigation, the researchers aim to determine the complete psychometric features of a translated instrument in a sample of the specific population of interest (**Sousa and Rojjanasrirat, 2011).**

The Tampa scale for kinesiophobia is a concise and user-friendly questionnaire that allows patients to easily assess their fear of movement and resulting disability. It is a convenient and efficient tool for therapists to evaluate this fear, taking less than 4 minutes to complete. The questionnaire consists of clear and comprehensible items, making it easily understandable for patients. Additionally, it serves as an effective follow-up tool. The completed version serves as the foundation for future investigations that aim to determine the complete psychometric features of the Arabic-language version of the TSK.

CONCLUSION

The findings from the present study, along with the subsequent discussion, support the conclusion that the translated Arabic version of the Tampa Scale for Kinesiophobia demonstrates satisfactory content validity, feasibility, internal consistency reliability, and test-retest reliability. This indicates that the scale can effectively measure kinesiophobia in patients who have undergone breast cancer surgeries.

ACKNOWLEDGMENT

A lot of thanks to all patients and all members who participated in this study and made it possible to be executed, as well as to my friends and colleagues for their assistance and support throughout the study.

I would like to thank my parents and sisters in particular as they have been so supportive and have made countless sacrifices during the entire process. they have motivated me to complete this dissertation as soon as possible.

LIMITATIONS

- Some distracted patients had filled out the questionnaire randomly.

- Some patients had not continued the study by not filling out the scale for the second time.
- The high rate of illiteracy among patients, especially with the age group ranging from 50 to 60 years.
- The low rate of patients who coped with the inclusion criteria followed had elongated the period of study.

RECOMMENDATIONS

The findings of this study suggest that it is necessary to take into account the following suggestions:

1. Additional research is needed to determine the complete psychometric properties (including face, construct, as well as criterion validity) of the translated Arabic version of TSK in a representative sample of the intended target population.
2. Additional studies should be conducted to translate, adapt in addition to validate the short forms of Tampa Scale for Kinesiophobia (TSK-13 and TSK-11).
3. Further studies should be conducted to conclude the illiterate people and also elderly people with special instructions and explanations with the help of their family.

REFERENCES

1. **Banegas, M. P., Bird, Y., Moraros, J., King, S., Prapsiri, S., & Thompson, B. (2012).** Breast cancer knowledge, attitudes, and early detection practices in United States-Mexico border Latinas. *Journal of Women's Health*, *21*(1), 101-107.
2. **Łukasiewicz, S., Czeczelewski, M., Forma, A., Baj, J., Sitarz, R., & Stanisławek, A. (2021).** Breast cancer—epidemiology, risk factors, classification, prognostic markers, and current treatment strategies—an updated review. *Cancers*, *13*(17), 4287.
3. **Zaidi, S., Hussain, S., Verma, S., Veqar, Z., Khan, A., Nazir, S. U., ... & Mehrotra, R. (2018).** Efficacy of complementary therapies in the quality of life of breast cancer survivors. *Frontiers in oncology*, *7*, 326.
4. **Bjerkeset, E., Röhrl, K., & Schou-Bredal, I. (2020).** Symptom cluster of pain, fatigue, and psychological distress in breast cancer survivors: prevalence and characteristics. *Breast cancer research and treatment*, *180*(1), 63-71.
5. **Gencay Can, A., Can, S. S., Ekşioğlu, E., & Çakcı, F. A. (2018):** "Is kinesiophobia associated with lymphedema, upper extremity function, and psychological morbidity in breast cancer survivors?." Turkish journal of physical medicine and rehabilitation, 65(2), 139–146.
6. **Crombez, G., & Eccleston, C. Van damme, S., Vlaeyen, JWS, & Karoly, P.(2012**). Fear-avoidance model of chronic pain: The next generation. Clinical Journal of Pain, 28, 475-483.
7. **Maxwell C, Robinson K, McCreesh K. (2021):** "Managing shoulder pain: a meta-ethnography exploring health care providers'experience." Disability and Rehabilitation 1-13.
8. **Kimberlin CL, Winterstein AG. (2008).** Validity and reliability of measurement instruments used in research. Am J Health Syst Pharm; 65(23): 2276-2284.
9. **Vlaeyen, J. W., Kole-Snijders, A. M., Boeren, R. G., & Van Eek, H. (1995).** Fear of movement/(re) injury in chronic low back pain and its relation to behavioral performance. *Pain*, *62*(3), 363-372.
10. **Crombez G, Vlaeyen JW, Heuts PH, Lysens R (1999).** Pain related fear is more disabling than pain itself: evidence on the role of pain-related fear in chronic back pain disability. Pain 80: 329-339.
11. **Miller RP, Kori SH, Todd DD (1991**). The Tampa Scale. Unpublished Report, Tampa, FL.
12. **Clark M (1996).** Kinesiophobia and chronic pain: psychometric characteristics and factor analysis of the Tampa Scale. In Paper presented at:The 15th Annual Scientific Meeting of the American Pain Society (1996) Washington, DC.

13. **Cook A. J, Brawer P. A, Vowles K.E (2006).** The fear-avoidance model of chronic pain:validation and age analysis using structural equation modeling Pain 121 195–206.
14. **French D. J, France C. R, Vigneau F, French J. A, Evans R.T (2007).** Fear of movement/(re) injury in chronic pain:a psychometric assessment of the original English version of the Tampa scale for kinesiophobia (TSK Pain 127 42–51).
15. **Woby S. R, Roach N. K, Urmston M, Watson P.J (2005).** Psychometric properties of the TSK-11:a shortened version of the Tampa Scale for Kinesiophobia Pain 117 137–144.

16. **Roelofs J, Sluiter J. K, Frings-Dresen M. H, Goossens M, Thibault P, Boersma K, Vlaeyen J.W (2007).** Fear of movement and (re) injury in chronic musculoskeletal pain: Evidence for an invariant two-factor model of the Tampa Scale for Kinesiophobia across pain diagnoses and Dutch, Swedish, and Canadian samples Pain 131 181–190
17. **Yilmaz, O., Yakut, Y., Uygur, F., & Ulug, N. (2011).** Turkish version of the Tampa Scale for Kinesiophobia and its test-retest reliability. *Turkish Journal Of Physiotherapy Rehabilitation-Fizyoterapi Rehabilitasyon*, 22(1).
18. **Gomez-Perez L, Lopez-Martinez A. E, Ruiz-Parraga G. T (2011).** Psychometric properties of the Spanish version of the Tampa Scale for Kinesiophobia (TSK) The Journal of Pain 12 425–435.
19. **Rusu A. C, Kreddig N, Hallner D, Hulsebusch J, Hasenbring M.I (2014).** Fear of movement/(Re) injury in low back pain:confirmatory validation of a German version of the Tampa Scale for Kinesiophobia BMC Musculoskeletal Disorders 15 1–9
20. **Juweid, M., Farah, K., Hawamdeh, Z., Alqudah, A., Nowlin, L., Vlaeyen, J., & Trost, Z. (2015).** Fear of Movement/[Re] Injury Among Arabic Low Back Pain Patients: Establishing the Validity of the Tampa Scale of Kinesiophobia–Arabic Version. Myopain, 23(3-4), 134-142.
21. **Bid D. D, Ramalingam A. T, Sinha S. R, Rathi P. B, Patel V. N, Rajwani J. M, Patel K.N (2018)**. Cross-cultural adaptation, reliability, validity, and factor analysis of the Gujarati version of the Tampa scale of kinesiophobia in chronic low back pain Physiotherapy-The Journal of Indian Association of Physiotherapists 12 79
22. **Wei X, Xu X, Zhao Y, Hu W, Bai Y, Li M (2015)**. The Chinese version of the Tampa Scale for Kinesiophobia was cross- culturally adapted and validated in patients with low back pain Journal of Clinical Epidemiology 68 1205–1212.
23. **Matsudaira K, Inuzuka K, Kikuchi N, Sakae C, Arisaka M, Isomura T, Miller R (2013)**. Development of a Japanese version of the Tampa Scale for Kinesiophobia (TSK-J): translation and linguistic validation Rinsho Seikei Geka 48 13–19.
24. **De Souza F. S, da Silva Marinho C, Siqueira F. B, Maher C. G, Costa L.O. P (2008).** Psychometric testing confirms that the Brazilian-Portuguese adaptations, the original versions of the Fear-Avoidance Beliefs Questionnaire, and the Tampa Scale of Kinesiophobia have similar measurement properties Spine 33 1028–1033.
25. **Monticone M, Giorgi I, Baiardi P, Barbieri M, Rocca B, Bonezzi C (2010)**. Development of the Italian version of the Tampa Scale of Kinesiophobia (TSK-I):cross-cultural adaptation, factor analysis, reliability, and validity Spine 35 1241–1246.
26. **Haugen A. J, Gr0vle L, Keller A, Grotle M (2008).** Cross-cultural adaptation and validation of the Norwegian version of the Tampa scale for kinesiophobia Spine 33 E595–E601.
27. **Hambleton RK, Merenda PF, Spielberger CD. (Eds.). (2004).** Adapting educational and psychological tests for cross-cultural assessment. Psychology Press.
28. **Holden R. (2010):** "The Corsini Encyclopedia of Psychology, Face Validity." Hoboken.
29. **Georgakellos DA, Macris AM. (2009):** "Application of the semantic learning approach in the feasibility studies preparation training process." Inf Syst Manag; 26(3): 231-240.

30. **Heale R, Twycross A. (2015).** Validity and reliability in quantitative studies. Evid Based Nurs; 18(3): 66-67.

31. **Borsa, J. C., Damásio, B. F., & Bandeira, D. R. (2012).** Cross-cultural adaptation and validation of psychological instruments: Some considerations. *Paidéia (Ribeirão Preto)*, *22*, 423-432.

32. **Sousa VD, Rojjanasrirat W. (2011).** Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. J Eval Clin Pract; 17(2): 268-274.

33. **Van der Gucht, E., Dams, L., Meeus, M., Devoogdt, N., Beintema, A., Penen, F., ... & De Groef, A. (2020).** Kinesiophobia contributes to pain-related disability in breast cancer survivors: a cross-sectional study. Supportive Care in Cancer, 28(9), 4501-4508.

34. **Mogahed, H. G. H., Mohamed, N. A., & Wahed, M. H. M. A. (2020).** Impact of 8-weeks combined cyriax soft tissue release and proprioceptive neuromuscular facilitation on glenohumeral rhythm in post mastectomy adhesive capsulitis. *Research Journal of Pharmacy and Technology*, *13*(10), 4903-4908.

35. **Polit D. and Beck C.** The content validity index : are you sure you know what's being reported ? Critique and recommendations . Nurs Health, 2006 ; 29 (5) : 489 – 497 .

36. **Waltz C, Strickland O, Lenz E**: Measurement in Nursing and Health Research, 3re edition. New York; Springer Publishing Company;2005.

37. **van Veen, M. J., Birnie, E., Poeran, J., Torij, H. W., Steegers, E. A., & Bonsel, G. J. (2015).** Feasibility and reliability of a newly developed antenatal risk score card in routine care. Midwifery, 31(1), 147-154.

38. **George D and Mallery P.** SPSS for Windows step by step: A simple guide and reference, 11.0 updarte, 4th edition .Boston: Allyn and Bacon.2003.

39. **Huang, H., Nagao, M., Arita, H., Shiozawa, J., Nishio, H., Kobayashi, Y., ... & Kaneko, K. (2019).** Reproducibility, responsiveness and validation of the Tampa Scale for Kinesiophobia in patients with ACL injuries. *Health and quality of life outcomes*, *17*(1), 1-8.

40. **Lundberg, M. K., Styf, J., & Carlsson, S. G. (2004).** A psychometric evaluation of the Tampa Scale for Kinesiophobia—from a physiotherapeutic perspective. *Physiotherapy theory and practice*, *20*(2), 121-133.

41. **Yilmaz, O., Yakut, Y., Uygur, F., & Ulug, N. (2011).** Turkish version of the Tampa Scale for Kinesiophobia and its test-retest reliability.*Turkish Journal Of Physiotherapy Rehabilitation-Fizyoterapi Rehabilitasyon*, *22*(1).

42. **Koho, P., Aho, S., Kautiainen, H., Pohjolainen, T., & Hurri, H. (2014).** Test–retest reliability and comparability of paper and computer questionnaires for the Finnish version of the Tampa Scale of Kinesiophobia. *Physiotherapy*, *100*(4), 356-362.

43. **French, D. J., France, C. R., Vigneau, F., French, J. A., & Evans, R. T. (2007).** Fear of movement/(re) injury in chronic pain: a psychometric assessment of the original English version of the Tampa scale for kinesiophobia (TSK). *Pain*, *127*(1-2), 42-51.