ORIGINAL ARTICLE
PAIN

COMPARISON BETWEEN START BACK SCREENING TOOL AND DRAM FOR DETECTION OF PSYCHOSOCIAL FACTORS IN LOW BACK PAIN

COMPARAÇÃO ENTRE START BACK SCREENING TOOL E DRAM NA DETECÇÃO DE FATORES PSICOSSOCIAIS EM DOR LOMBAR

COMPARACIÓN ENTRE START BACK SCREENING TOOL Y DRAM EN LA DETECCIÓN DE FACTORES PSICOSOCIALES EN DOLOR LUMBAR

CARLOS TUCCI[1,3,4], ALEX OLIVEIRA DE ARAUJO[1,2], RAPHAEL MARTUS MARCON[1], ALEXANDRE FOGAÇA CRISTANTE[1], TARCÍSIO ELOY PESSOA DE BARROS FILHO[1]

1. Hospital das Clínicas of the School of Medicine of Universidade de São Paulo (FMUSP), Instituto de Ortopedia e Traumatologia (IOT), São Paulo, SP, Brazil.
2. Hospital Sarah Kubitschek, Brasília, DF, Brazil.
3. Instituto Vita, São Paulo, SP, Brazil.
4. Pontifícia Universidade Católica (PUC) de Campinas, Spine Surgery Department, Campinas, SP, Brazil.

ABSTRACT

Objective: To correlate the results of the STarT Back Screening Tool and DRAM questionnaires, applied simultaneously, in a population with low back pain. Methods: Comparative cross-sectional study with 84 participants with low back pain assessed by both STarT Back Screening Tool (SBST) and DRAM questionnaires. The degree of correlation between the two questionnaires was analyzed through the evaluation of individualized data and using the Spearman correlation coefficient. Results: According to the DRAM, 19% of the patients were classified as "normal", 32.1% as "at risk" and 48.8% as "distressed". According to SBST, 59.5% of patients were classified as "low risk", 31% as "medium risk" and 9.5% as "high risk". Applying the Spearman's coefficient to evaluate the degree of correlation between the two questionnaires, a value of 0.4 was obtained. This shows that there is a positive, but weak, correlation ($p < 0.001$) between the two questionnaires. Conclusion: There is a positive correlation between the two questionnaires, but the DRAM showed a greater tendency to classify patients with some degree of psychological distress when compared to the SBST. Both questionnaires are effective in identifying these factors, but the data suggest that the DRAM may be more effective as a screening tool in patients with low back pain, in view of the higher number of patients identified. ***Level of evidence III; Diagnostic test study.***

Keywords: Low Back Pain; Spine Diseases; Quality of Life; Risk Assessment; Surveys and Questionnaires.

RESUMO

Objetivo: Correlacionar os resultados dos questionários STarT Back Tool e DRAM, aplicados em um único tempo, a uma população com dor lombar. Métodos: Estudo transversal comparativo com 84 participantes portadores de dor lombar baixa submetidos aos questionários STarT Back Screening Tool (SBST) e DRAM. O grau de correlação entre os dois questionários foi analisado pela avaliação dos dados individualizados e do coeficiente de correlação de Spearman. Resultados: De acordo com o DRAM, 19% dos pacientes foram classificados como "normais", 32,1% "em risco" e 48,8% se enquadraram no subgrupo "distressed". De acordo com o SBST, 59,5% dos pacientes foram classificados como "baixo risco", 31% "risco médio" e 9,5% "alto risco". Ao aplicar o coeficiente de Spearman para avaliar o grau de correlação entre os dois questionários, foi obtido o valor de 0,4. Isso mostra que há uma correlação positiva entre os dois questionários, embora seja considerada correlação fraca ($p < 0,001$). Conclusão: Há uma correlação positiva entre os dois questionários, porém o DRAM mostrou tendência maior a identificar pacientes com algum grau de transtorno psíquico quando comparado com o SBST. Ambos os questionários são efetivos para identificar esses fatores, mas os dados sugerem que o DRAM talvez seja mais efetivo como ferramenta de triagem em pacientes com dor lombar baixa, em virtude do maior número de doentes identificados. ***Nível de evidência III; Estudo diagnóstico.***

Descritores: *Dor Lombar; Doenças da Coluna Vertebral; Qualidade de Vida; Medição de Risco; Inquéritos e Questionários.*

RESUMEN

Objetivo: Correlacionar los resultados de los cuestionarios STarT Back Tool y DRAM, aplicados de una sola vez, en una población con dolor lumbar. Métodos: Estudio transversal comparativo con 84 participantes con dolor lumbar evaluados por los cuestionarios STarT Back Screening Tool (SBST) y DRAM. El grado de correlación entre los dos cuestionarios se analizó mediante la evaluación de datos individualizados y del coeficiente de correlación de Spearman. Resultados: Según DRAM, el 19% de los pacientes fue clasificado como "normal", el 32,1% como " en riesgo" y el 48,8% se encuadró en el subgrupo "distressed". Según SBST, el 59,5% de los pacientes fue considerado como de "bajo riesgo", el 31% de "riesgo medio" y el 9,5% de "alto riesgo". Al aplicar el coeficiente de Spearman para evaluar el grado de correlación entre los dos cuestionarios, se obtuvo un valor de 0,4. Ello demuestra que existe una correlación positiva, pero débil ($p < 0,001$) entre los dos cuestionarios. Conclusión: Existe una correlación positiva entre los dos cuestionarios,

Study conducted at IOT-FMUSP, São Paulo, SP, Brazil.
Correspondence: Carlos Tucci. Rua Mato Grosso 306, 1º andar, São Paulo, SP, Brazil. 01239-040. carlos.tucci@institutovita.com.br

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pero DRAM mostró una mayor tendencia a identificar pacientes con algún grado de trastorno psicológico en comparación con SBST. Ambos cuestionarios son eficaces para identificar estos factores, pero los datos sugieren que DRAM puede ser más eficaz como herramienta de detección en pacientes con dolor lumbar, debido al mayor número de pacientes identificados. ***Nivel de evidencia III; Estudio diagnóstico.***

Descriptores: *Dolor de la Región Lumbar; Enfermedades de la Columna Vertebral; Calidad de Vida; Medición de Riesgo; Encuestas y Cuestionarios.*

INTRODUCTION

Low back pain is a universal complaint that affects a considerable proportion of the global population, predominantly women and patients aged 40-80 years. Its high prevalence in the young adult population has a major economic impact, as it increases healthcare spending and reduces the productive capacity of the economically active population. There are numerous studies endeavoring to identify potentially modifiable risk factors for a worse prognosis of low back pain, with the objective of boosting the effectiveness of secondary prevention and treatment measures.[1,2]practical tools to help identify low back pain (LBP

The specific diagnosis of the causal factor of pain is not usually defined in about 80% of low back pain cases.[3] Abnormalities in imaging test results do not always indicate the etiology of the condition, and the indiscriminate use of imaging tests increases healthcare costs and may lead to potentially ineffective treatment, frustrating the patient's expectations.[3,4]

There is an important relationship between low back pain and psychological abnormalities,[5] with reports of an association of about 53% between chronic low back pain and relevant psychological disorders.[6,7] Patients who suffer from low back pain often exhibit a distinct inability to perform daily or occupational activities, and this interferes in their personal relationships and their behavior. This behavioral change associated with psychosocial factors contributes to treatment failure and the transition from an acute to chronic condition. The identification of these psychosocial factors that influence the prognosis can help to achieve a more specific treatment and improve the patient's understanding of his or her condition.[8]

Several scoring systems have been developed as a means of measuring these incapacities for the purpose of achieving language standardization, identifying risk groups and factors of worse prognosis, and facilitating patient treatment. The STarT Back Screening Tool (SBST) is a widely known scoring system developed for the purpose of assigning a score to potentially modifiable indicators of worse prognosis, in order to optimize the prevention and treatment of low back pain.[1,9]practical tools to help identify low back pain (LBP

The DRAM (Distress and Risk Assessment Method), in turn, is a practical tool that helps to assess the degree of psychological disorder in patients with low back pain.[10]those at risk of developing major psychological overlay, and those clearly distressed. Four patient types can be identified on the basis of scores on two short questionnaires. The construction of the Distress and Risk Assessment Method is described and validity data (both clinical and psychological It does not assess anxiety, personality changes or substance abuse. However, it is a good method for assessing somatization and depression symptoms, which are important items for assessing the psychological status of patients.[11]

Both scoring systems are already used in routine medical care, and have proved useful both in therapeutic decision-making and during treatment to evaluate results comparatively.

Prior to the publication of STarT Back, the DRAM had been used in predominant publications with similar goals: to classify psychological profiles in terms of the risk of poor prognosis.[12–16]four spinal surgeons and four nonoperative spine specialists, who evaluated 400 patients. All patients completed the Distress and Risk Assessment Method (DRAM The objective of this study was to compare the results of the STarT Back Screening Tool and DRAM questionnaires, which were administered to a population with low back pain, analyzing the degree of correlation between the two questionnaires.

METHODS

A comparative cross-sectional study carried out a single center between 2015 and 2016. The institutional review board analyzed and approved the study protocol (CAAE 36615514.7.1001.0068). All the subjects who participated in the study signed an informed consent form.

The study was conducted with 84 patients who met the following inclusion criteria: aged between 18 and 55 years; acute or subacute low back pain (between 0 and 90 days); willingness and ability to give consent and to understand and read the native language (Portuguese) at primary education level.

The patients were selected during their initial visit to the emergency unit of a public quaternary hospital, when they were invited to complete the STarT Back Screening Tool and DRAM questionnaires.

Patients who met the following exclusion criteria: neurological symptoms; pain lasting more than three months; illiteracy; presence of red flags (previous history of cancer, fever, weight loss, recent bacterial infection, immunosuppression, drug use, trauma), and patients with a detectable severe psychiatric illness, were not enrolled into this study.

The two questionnaires were administered to all the participants at the same time, during the first contact following authorization and completion of the consent form. The participants answered the questionnaires verbally using an interview template.

STarT (Subgroups Target Treatment) Back Screening Tool (SBST)

The SBST[9,17]including concurrent and discriminant validity, internal consistency, and repeatability, were assessed within a new development sample (n = 131 has nine items selected as predictors of worse prognosis for patients with persistent low back pain. Eight of these nine questions have an "I agree" (1 point) and "I disagree" (0 points) dichotomized response format, which facilitates applicability to patients, and the ninth question presents five response options, with the first three scoring zero and the latter two equivalent to 1 point. Four items are related to referred pain, dysfunction and comorbidities, such as shoulder or neck pain, and five items compose the psychosocial scale (items 5 to 9) referring to discomfort, catastrophizing, fear, anxiety and depression.

Patients are classified as high, medium and low risk according to the number of psychosocial factors present in the answers. The resulting values are interpreted according to the diagram in Figure 1.

DRAM (Distress and Risk Assessment Method)

The DRAM questionnaire[10,13]those at risk of developing major psychological overlay, and those clearly distressed. Four patient types can be identified on the basis of scores on two short questionnaires. The construction of the Distress and Risk Assessment Method is described and validity data (both clinical and psychological features 45 validated items commonly used to measure the level of psychological distress in patients receiving orthopedic care. It consists of the "Modified Somatic Perception Questionnaire" (MSPQ) subpart and the modified Zung Depression Scale - ZDS. The values of these two questionnaires are combined to stratify the patients into four groups: normal (no evidence of distress), at risk (higher scores with predominance of depression symptoms), distressed depressive (higher scores for all the variables but highest for depression symptoms) and distressed somatic (high scores for all the variables, particularly the somatic part).

Patients considered normal have a modified ZDS <17, those at

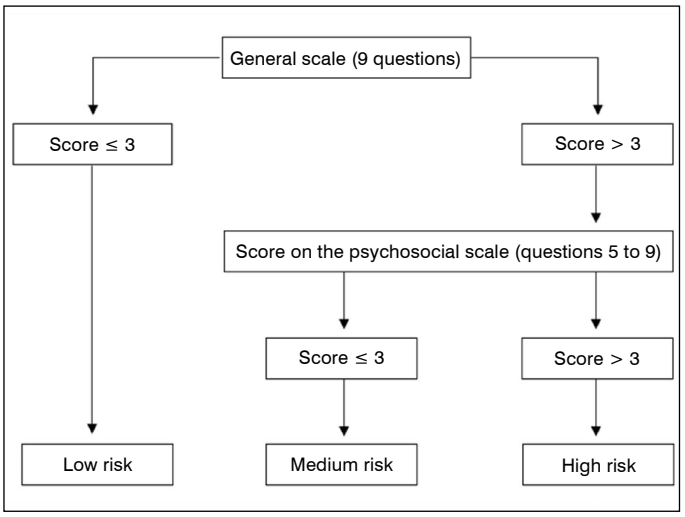

Figure 1. SBST questionnaire scoring and classification flowchart.

risk have a modified ZDS between 17 and 33 and an MSPQ score <12; distressed depressive patients have a modified ZDS >33, and distressed somatic patients have a modified ZDS between 17 and 33, but an MSPQ score >12.

Statistical analysis

All the data were pooled, categorized, and entered into a Microsoft Office Excel electronic spreadsheet. The results were submitted to statistical analysis through the SPSS program and presented in tabular form. All the appropriate demographics were summarized and listed, and the association between the final score of the questionnaires was analyzed using Spearman's correlation coefficient, assuming a p-value of <0.05 as statistically significant. We used the following Spearman coefficient intervals to define the correlation strength[18]: 1.0-0.9 very strong correlation; 0.9-0.7 strong correlation; 0.7-0.5 moderate correlation; 0.5-0.3 weak correlation; 0.3-0.0 negligible correlation.

RESULTS

A total of 84 patients completed the DRAM and STarT Back Screening Tool (SBST) questionnaires. Of the 84 patients, 64% were female and 36% male. The average age at the questionnaire administration timepoint was 36 years (22-55, minimum and maximum 33.7-37.5 95% confidence interval).

To compare the results of the two questionnaires, the distressed somatic and distressed depressive subgroups of the DRAM were unified, forming a single subgroup of patients with distress. Thus, both questionnaires continued with 3 subgroups each.

Analyzing the DRAM questionnaire separately, 19% of patients were classified as "normal", 32.1% "at risk" and 48.8% were categorized in the "distress" subgroup. (Table 1)

The SBST tool, in turn, classified patients as follows: 59.5% low risk, 31% medium, and 9.5% high risk. (Table 2)

When assessing the DRAM and SBST tools together, we noted that of the 16 patients classified as "normal" by the DRAM, 12 (75%) were classified as low risk and four (25%) as medium risk by the SBST. Conversely, of the 27 patients classified in the "at risk" subgroup according to the DRAM, 22 (81.5%) were classified as low risk and 5 (18.5%) as medium risk by the SBST. Regarding the last subgroup of the DRAM, 41 patients were classified with some degree of distress, of which 16 patients (39%) were classified as low risk, 17 (41.5%) as medium risk and eight patients (19.5%) as high risk according to the SBST. (Table 3)

Applying Spearman's coefficient to assess the degree of correlation between the two questionnaires, we obtained the value of 0.4. This shows a positive, albeit weak correlation between the two questionnaires ($p<0.001$).

Table 1. DRAM Results.

	Frequency	Percentage
Normal	16	19%
At risk	27	32.1%
DD/DS	41	48.8%
Total	84	100%

Table 2. SBST Results.

Frequency	Percentage
50	59.5%
26	31%
8	9.5%
84	100%

Table 3. DRAM versus SBST.

			SBST			Total
			Low risk	Medium risk	High risk	
DRAM	Normal	Count	12	4	0	16
		% in DRAM	75.0%	25.0%	0.0%	100.0%
		% in SBST	24.0%	15.4%	0.0%	19.0%
	At risk	Count	22	5	0	27
		% in DRAM	81.5%	18.5%	0.0%	100.0%
		% in SBST	44.0%	19.2%	0.0%	32.1%
	Distressed	Count	16	17	8	41
		% in DRAM	39.0%	41.5%	19.5%	100.0%
		% in SBST	32.0%	65.4%	100.0%	48.8%
		Count	50	26	8	84
		% in DRAM	59.5%	31.0%	9.5%	100.0%
		% in SBST	100.0%	100.0%	100.0%	100.0%

DISCUSSION

Both questionnaires are intended to identify psychological disorders in patients, which is of the utmost importance when providing care to patients with low back pain. Moreover, both the DRAM and the SBST are already widely known and applied at various specialized centers in the world. What we noted with this study was the presence of a positive correlation between the two questionnaires, i.e., the DRAM score deteriorates in parallel to the STarT Back score. The magnitude of Spearman's correlation coefficient determines the strength of the correlation. There are no good rules for assigning specific values to strength of association, but coefficients tend to be lower than Pearson's correlation coefficients. Spearman's correlation coefficient in this example (Spearman's rho = 0.4) suggests a weak correlation, $p<0.001$.

The DRAM showed a greater tendency to identify patients with some degree of mental disorder compared to the SBST. Of the total of 84 patients, 48.8% were classified by DRAM as having some degree of psychological distress, while only 9.5% of cases were classified by the SBST as high risk patients. These data may suggest that the DRAM applies more adequately as a screening tool for professionals not specialized in mental disorders to identify any abnormality in their patients. Thus, once this risk fact is identified, professionals can refer their patients to a specialist for a more accurate assessment of their particular psychological condition, contributing across the board to a better result with the established treatment.

These instruments are important tools for use in medical practice, as not everyone has the skills to identify these abnormalities in patients. Daubs et al.,[12] four spinal surgeons and four nonoperative spine specialists, who evaluated 400 patients. All patients completed the Distress and Risk Assessment Method (DRAM developed a study designed to analyze the ability of spinal surgery fellows and fellows specialized in clinical areas to assess the psychological distress of patients with spinal diseases. They noted that surgeons did not accurately assess the patient's level of psychological distress, particularly in the most severe categories (distress depressive

and somatic). The physicians being assessed classified a greater number of patient cases as normal, in comparison to the results of the DRAM questionnaire. They also noted that a large number of patients presented with some degree of psychological distress (64%), with 22% having the most severe forms, which can directly impact surgical outcomes.

In an attempt to facilitate the recognition of these cases, Daubs et al.,[16] assessed 388 patients in another study in order to identify clinical pointers capable of predicting the possibility of psychological distress in patients with spinal diseases. They noted that patients with Oswestry disability index (ODI) >58, previous history of surgery, visual analog scale (VAS) >7 and a history of depression are more likely to fall within the range of the highest levels of distress according to the DRAM questionnaire (distress depressive and somatic).

Besides identifying this potential risk factor for poor treatment outcome, the questionnaires also allow for a more careful assessment of the degree of patient satisfaction with the treatment they are undergoing. Abtahi et al.,[11] assessed 103 patients retrospectively in order to demonstrate whether there is any association between the level of psychological distress and the degree of patient satisfaction with the care provided. They used a satisfaction questionnaire together with the DRAM. The authors noted that patients with distress somatic or depressive had significantly lower satisfaction scores than normal or at-risk patients, classified according to the DRAM questionnaire.

There is already a wide variety of articles in the literature that show the importance of taking into account the mental status of patients with spinal disorders, as an adjunct to treatment planning. This paper shows that both questionnaires correlate and are effective in identifying these factors. The main limitation of the study is the low number of participants. The results also suggest that the DRAM may be more effective as a screening tool in patients with low back pain, contributing to the planning and more appropriate treatment of this group of patients.

As STarT Back has become a more widely used practical tool in recent years due to its greater simplicity and user-friendly design, this study compared the two questionnaires analytically and concluded that there is a positive correlation between both, which enables us to interpret the results of publications that used either of these instruments.

The weak statistical correlation is due to the fact that the sample group only contains 84 subjects, which suggests that future research should discuss larger populations.

CONCLUSION

There is a positive correlation between the two questionnaires, yet the DRAM showed a greater tendency to identify patients with some degree of mental disorder when compared to the SBST. Both questionnaires are effective in identifying these factors, but the data suggest that the DRAM may be more effective as a screening tool in patients with low back pain, due to the higher number of patients identified.

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REFERENCES

1. Hill JC, Dunn KM, Main CJ, Hay EM. Subgrouping low back pain: a comparison of the STarT Back Tool with the Orebro Musculoskeletal Pain Screening Questionnaire. Eur J Pain. 2010;14(1):83-9. doi:10.1016/j.ejpain.2009.01.003.
2. Boersma K, Linton SJ. Screening to identify patients at risk: profiles of psychological risk factors for early intervention. Clin J Pain. 2005; 21(1):38-43; discussion 69-72. Disponível em: http://www.ncbi.nlm.nih.gov/pubmed/15599130.
3. Hall H, McIntosh G, Boyle C. Effectiveness of a low back pain classification system. Spine J. 2009;9(8):648-57. doi:10.1016/j.spinee.2009.04.017.
4. Chou R, Fu R, Carrino JA, Deyo RA. Imaging strategies for low-back pain: systematic review and meta-analysis. Lancet. 2009;373(9662):463-72. doi:10.1016/S0140-6736(09)60172-0.
5. Djurasovic M, Glassman SD, Howard JM, Copay AG, Carreon LY. Health-Related Quality of Life Improvements in Patients Undergoing Lumbar Spinal Fusion as a Revision Surgery. Spine (Phila Pa 1976). 2011;36(4):269-76. doi:10.1097/BRS.0b013e3181cf1091.
6. Apeldoorn AT, Bosselaar H, Ostelo RW, Blom - Luberti T, van der Ploeg T, Fritz JM, et al. Identification of patients with chronic low back pain who might benefit from additional psychological assessment. Clin J Pain. 2012;28(1):23-31. doi:10.1097/AJP.0b013e31822019d0.
7. Amaral V, Marchi L, Oliveira L, Pimenta L. Prevalence and relationship of emotional and clinical factors in patients with degenerative disc disease. Coluna/Columna. 2010;9(2):150-6
8. Main CJ, Sowden G, Hill JC, Watson PJ, Hay EM. Integrating physical and psychological approaches to treatment in low back pain: the development and content of the STarT Back trial's "high-risk" intervention (StarT Back; ISRCTN 37113406). Physiotherapy. 2012;98(2):110-6. doi:10.1016/j.physio.2011.03.003.
9. Hill JC, Dunn KM, Lewis M, Mullis R, Main CJ, Foster NE, et al. A primary care back pain screening tool: identifying patient subgroups for initial treatment. Arthritis Rheum. 2008;59(5):632-41. doi:10.1002/art.23563.
10. Main CJ, Wood PL, Hollis S, Spanswick CC, Waddell G. The Distress and Risk Assessment Method. A simple patient classification to identify distress and evaluate the risk of poor outcome. Spine (Phila Pa 1976). 1992;17(1):42-52. Disponível em: http://www.ncbi.nlm.nih.gov/pubmed/1531554.
11. Abtahi AM, Brodke DS, Lawrence BD, Zhang C, Spiker WR. Association between patient-reported measures of psychological distress and patient satisfaction scores after spine surgery. J Bone Joint Surg Am. 2015;97(10):824-28. doi:10.2106/JBJS.N.00916.
12. Daubs MD, Patel AA, Willick SE, Kendall RW, Hansen P, Petron DJ, et al. Clinical impression versus standardized questionnaire: the spinal surgeon's ability to assess psychological distress. J Bone Joint Surg Am. 2010;92(18):2878-83. doi:10.2106/JBJS.I.01036.
13. Tucci C, Jacob A, Amorim T, Araújo AO, Cristante AF. Tradução, adaptação cultural e confiabilidade da versão em português brasileiro do questionário DRAM (Distress Risk Assessment Method) para avaliação psicométrica em indivíduos com dor lombar. Rev Bras Ortop. 2020;55(1):54-61.
14. Vialle E, Pinto BMO, Vialle LR, Gomez JDC. Evaluation of psychosomatic distress and its influence in the outcomes of lumbar fusion procedures for degenerative disorders of the spine. Eur J Orthop Surg Traumatol. 2015;25(Suppl 1):S25-8. doi:10.1007/s00590-015-1641-2.
15. Bakhsheshian J, Scheer JK, Gum JL, Hostin R, Lafage V, Bess S, et al. Impact of poor mental health in adult spinal deformity patients with poor physical function: A retrospective analysis with a 2-year follow-up. J Neurosurg Spine. 2017;26(1):116-24. doi:10.3171/2016.5.SPINE151428.
16. Daubs MD, Hung M, Adams JR, Patel AA, Lawrence BD, Neese AM, et al. Clinical predictors of psychological distress in patients presenting for evaluation of a spinal disorder. Spine J. 2014;14(9):1978-1983. doi:10.1016/j.spinee.2013.07.487.
17. Pilz B, Vasconcelos RA, Marcondes FB, Lodovichi SS, Mello W, Grossi DB. The Brazilian version of start back screening tool - translation, cross-cultural adaptation and reliability. Brazilian J Phys Ther. 2014;18(5):453-61. doi:10.1590/bjpt-rbf.2014.0028.
18. Mukaka MM. Statistics corner: A guide to appropriate use of correlation coefficient in medical research. Malawi Med J. 2012;24(3):69-71.