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Statistical evaluation of Low Back Pain Patients in Peshawar District

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ABSTRACT
Low Back Pain (LBP) is one of the vastly encountered complaints by physicians all over the world. This study attempts to do statistical evaluation of low back pain patient's data through three questionnaires in Peshawar district. The data was collected from 300 low back pain patients Khyber Teaching Hospital, Peshawar both from male and female as well as patients belonging to rural and urban regions. The data showed that the female patients of low back pain were suffering more than the male patients, and rural area patients were more complaining than the urban patients. The cronbach alpha for RMDQ, ODI and PSEQ were 0.694, 0.920 and0.724 respectively, means the ODI has the highest reliability. From the Rasch analysis of RMDQ, it is clearly observed that the highest estimate of eta (item difficulty) (strong trait of disability) is for the question "stay in bed because of my back pain". The other significant items were: "My appetite is not very good because of my back pain", "I walk more slowly than usual because of my back", "I sleep less well because of my back", "Because of my back pain, I get dressed with help from someone else", "I sit down for most of the day because of my back" and "Because of my back pain, I am more irritable and bad tempered with people than usual".
Keyword: Low Back Pain, Gender, Peshawar, Khyber Teaching Hospital, Rasch analysis

Introduction

Low Back Pain (LBP) is one of the vastly encountered complaints by physicians all over the world. There will be no primary caregiver who would not have treated LBP or referred a case for further assessment at the tertiary level. With the current advancements in the ground of evidence-based medicine, much emphasis is given to outcomes of the health care provision. Most of the population worldwide encounters LBP at some stage in their life. LBP has been most comprehensively defined in the literature as: "Pain limited between the lower margins of the 12th ribs and the gluteal regions"(Louw, Morris & Grimmer-Sommers, 2007).

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There are numerous causes of LBP mentioned in literature. The most common causes are: a) lumbar strain, b) nerve irritation, c) lumbar radiculopathy, d) bony encroachments and e) bone and joint conditions. In females, however, childbirth plays a significant role too.LBP continues to be one of the main problems for which sufferers seek treatment in primary care (Battie, et al ,1994), and is considered worldwide to be associated with enormous costs, both in terms of direct health-care costs and losses in relation to work and disability (Borkan, Tulder& Reiss, 2002). Pain is often expressed by the individual as the main reason for seeking care, even if the goal of the treatment is more often to reduce functional limitations caused by the pain. Uptil now, there is no proper "cure" for LBP, although an active physical approach has been advocated (Airaksinen, 2006).

An important characteristic of Chronic LBP is its impact on the individual's life. It may limit the performance of activities in daily living, work, and leisure time. These limitations in the performances may impact the general health, overall well-being and work ability. Another important characteristic of CLBP is its impact on society. Back pain is one of the most common reasons for health care use, work loss and sickness benefits. It is responsible for a large amount of the consumption of medical resources. Most patients with back pain are limited and restricted in their daily functioning but it is not clear to what extent this is caused by pain rather than actual physical impairment.

To describe the impact of CLBP on patients daily functioning, disability should be described in terms of activity limitations and participation restrictions. Patients are not able to carry out the normal activities for the same duration and frequency as before. Furthermore, CLBP affects quality of life because patients experience restrictions.

LBP has been a problem for mankind throughout history. The oldest surviving text on this subject was written on papyrus about 1500 B.C. It is a series of 48 cases, the last of which was an acute back strain as noted by(Allan and Waddell,1989).The relation between body and mind is fundamental to human existence and was discussed as early as 427 B.C. by Plato. By 1800, physicians were beginning to look for a cause of back pain and suggested that it was 'rheumatic phlegm'. In 1828, it was suggested for the first time that the vertebral column and the nervous system could be the source of back pain, which should be treated with rest (Allan &Waddell, 1989).

Pain is a complex phenomenon associated both with emotional and psychological reactions. In all kinds of pain there are two components: subjective judgments of its intensity, localization and duration, and the emotional, discomfort and distressing experience that it brings. The consensus definition of pain developed by the International Association for the Study of Pain (IASP) as "an un pleasant and emotional experience associated with actual or potential tissue damage, or described in terms of such damage". Low-back pain generally defined, as mentioned in the literature is: "Pain, ache or discomfort, localized below the costal margin and above the inferior gluteal folds (with or) without referred leg pain" (Merskey & Bogduk, 1994).

Measuring the level of disability due to pain is very important to evaluate its functional status. This is done by the use of various disability questionnaires for LBP. The three Questionnaires generally used are: Roland-Morris

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Disability Questionnaire (RMDQ), the Oswestry Disability Index (ODI), the Pain Self-Efficacy Questionnaire (PSEQ). These questionnaires assess disability resulted by LBP of patients who seek medical attention. To assess physical disability caused by LBP these are condition-specific health status measure designed to be completed by patients.

The other questionnaires developed for such purpose are: the Quebec Back Pain Disability level (QBPDL), Waddell Disability Index (WDI), Back Pain Functional Scale (BPFS), Visual Analogue Scale (VAS) and the bodily fitness balance of the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), etc., but they are rarely used with huge modifications according to norms and culture of the community.

The Roland-Morris Disability Questionnaire (RMDQ) was originally derived from Sickness Impact Profile a 36 item piece, which in its own self was a measurement of physical and mental status of the patient (Nachemson, 1992). It was originally made for research purposes but then primarily used in primary care settings in the UK for assessing the disability caused by the low back pain. The first questionnaire was first time used in 1983, to review the severity of LBP on normal actions. To reveal disability level caused by LBP in the activities of the patients like walking, self-care and lying etc., the RMDQ contains 24 statements ranging scores from 0 (no disability) to 24 (severe disability). Patients are required to answer in affirmative or in negative to each statement. Each affirmative answer was assigned one point (Maughan & Lewis, 2010).

Owing to its easy approach and simple understanding for patients, the questionnaire has been adapted and translated in to various different languages with regards to and applying modifications as per the Cultural norms and ethics of the locality. The scale is one of the most widely used outcome measures for patients with low back pain. However, there was no data on how to assess this aspect in Pakistan population. These translations are conceptual equivalents of the original form and monitored by the Messaging Application Program Interface (MAPI) Research Institute, France.

John O'Brien (1976) initiated to develop Oswestry Disability Index (ODI). They interviewed dozens of patients suffering from chronic low back pain in a specialist referral clinic in order to identify the difficulties and disturbance of activities caused by chronic low back pain in daily living of patients. For the purpose an index was prepared for purpose of assessment and outcome as well. Questionnaire can be accomplished in time between 01 and 05 and scored in less than 1 minute(Roland & Fairbank, 2000).

To evaluate the level of pain and interference caused by the pain in different physical activities like social life, traveling, sleeping, sex life and self-care, the ODI is divided in ten portions. Each portion has been given score ranging from 0 to 5 to signify the possible six responses. The patients are asked to mark the most relevant response to them to answer a specific portion. The score of every portion is counted and is divided by the possible sum score (50 in case all portions are accomplished), and resulting score is multiplied by 100 to submit a percentage score with 0% corresponding no disability and 100% meaning by great deal of disability (Maughan & Lewis, 2010).

The Pain Self-Efficacy Questionnaire (PSEQ) is a 10-item questionnaire,

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developed in 1980s by Michael Nicholas to evaluate the confidence of the people, during encountering pain, while carrying on their activities. It covers wide range of activities like household tasks, socializing work as well as coping with pain without medication.

According to this questionnaire, patients are given ten listed activities, by selecting a number on a point scaled list. Wherein, Zero (00) is assigned to "not at all confident" and six (06) to "completely confident". Patients are required to ratethe level of their confidence in the presence of their pain while performing those activities. Scores on PSEQ may vary from 0 to 60, upper scores signifying superior self-efficacy attitude (Maughan& Lewis, 2010).

Low back pain is the most common, but also the most disabling complaint encountered in clinics around the world. Most of the population worldwide encounters LBP at some stage in their life. LBP has been most comprehensively defined by "Pain limited between the lower margins of the 12th ribs and the gluteal regions (Louw, Morris et al; 2007). Measuring the level of disability due to pain is very important to evaluate its functional status. This is done by the use of various disability questionnaires for LBP. The most widely used are: RMDQ, ODI, and PSEC. There is an exhaustive list of studies done to analyze and test these questionnaires for various statistical parameters, for instance, the reliability and validity, and internal correlation etc. The conclusions of some of these studies are mentioned in the next paras.

Roland and Fairbank (2000) studied the LBP with the use of ODI and concluded that ODI should be used for patients who probably have constantly acute disability and RDQ in patients who are expected to have comparatively slight disability. Turner(2003) compared the RMDQ to widely used generic health status measure in a sample of workers with recent work related back injuries in term of validity, reliability, responsiveness to change and floor and ceiling effect and concluded that RMDQ is a suitable measure of physical disability among working folks encountering LBP.

Brouwer (2004) analyzed test-retest reliability and stability of the Dutch language version of the RMDQ on patients suffering from chronic low back pain. The Dutch RMDQ proved to be a reliable tool to evaluate practical situation in CLBP patients. Though, he suggested that the natural variation should be considered while using it clinically. Maaroufi et al, (2007)conducted a study, in which the English RMDQ was adapted and translated in Moroccan language and tested to validate its use for assessing disability of the population. Their results were consistent, the Intra-class correlation coefficient (ICC) was nearly 0.93, and the internal consistency with Cronbach α-coefficient was 0.96. Scharovsky et al.(2008) conducted a study by a translated culturally adapted RMDQ in Argentina, and concluded that as a valid lumber disability measurement tool, Argentinean version of RMDQ is reliable and valid, by an ICC reaching 0.94, while the value of Cronbach's alpha was excellent i.e. 0.9.

Maughan and Lewis (2010) studied to determine the responsiveness of the RMDQ, ODI and PSEQ in pursuance to find out which would best measure clinically significant change in a chronic low back pain (LBP) population. They opined that outcome measures through PSEQ provide useful information in order to determine real change and proof of usefulness of treatment. Moon et

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al, (2011) conducted a study on 221 patients in Korea to develop final version of the Korean RMDQ. They compared the responsiveness between RMDQ and ODI score in patients having low back pain.Their study showed that the Korean RMDQ is reliable and valid in Korean population with chronic low back pain patients and the test retest reliability of the Korean RMDQ was excellent,while the internal consistency assessed by means of Cronbach alpha was similar to the values present in the other studies. It was suggested that the Korean RMDQ is reliable and would be adequate for the follow up assessment of treatment in a busy clinical practice. Asghari (2011) studied the Six hundred chronic back pain patients with Modified version of Roland-Morris Disability Questionnaire (M-RMDQ) in Iran. The ICC of M-RMDQ was greater than 0.85. It was also concluded that M-RMDQ was a 'sound measure' of physical disability associated with chronic pain in the local population of Iran. Yi, et al (2012) conducted a comprehensive study in the Chinese mainland evaluating the different causes of LBP in rural and urban backgrounds. The internal consistency of Simplified Chinese version of RMDQ was high (i.e. Cronbach α value of 0.874 in city patients and 0.883 in countryside patients) and the questionnaire had also good reproducibility values (i.e. ICC value of .952 in inner-city patients and 0.949 in countryside patients).

Lu (2010) conducted a study to investigate the psychometric properties of the ODI in patients with back pain using Rasch analysis. His results showed that the ODI is uni-dimensional questionnaire with high reliability and the ODI can specifically estimate the stage of dysfunctions, while item difficulty of ODI matches the person capability.

Grotle, et al, (2013) evaluated RMDQ versions by using Rasch analysis. They examined the fit of data from 3 different RMDQ versions to a Rasch model when used in a Norwegian sample with chronic LBP; the original 24-item version, the 18-item versions, and the 11-item version of the RMDQ. The main finding of this study was that none of the 3 RMDQ versions are uni-dimensional measures of disability due to LBP when used in this Norwegian sample of patients with chronic LBP. They found that several items performed differently across subgroups of gender, age group, work status and use of pain medication.

Flavia, Pietro and Mark (2014) investigated the scale properties of the PSEQ using Rasch analysis and concluded that individual items of the PSEQ can be accurately summed to present a score of self-efficacy that is robust to age , sex, pain concentration, pain time, and disability. They found that the physically powerful self-efficacypredicts constructive treatment outcomes and accurate prediction, and week self-efficacy predicts long term disability.

Motivation of study

As above three questionnaires are mostly used for assessing the disability of LBP, but many studies revealed that no one is best suitable everywhere. So there was a dire need to measure the level of disability due LBP through these three questionnaires and find out which is best suited for Peshawar district. So, it was required to collect the data from patients (having LBP complaint) on three questionnaires RMDQ, ODI and PESQ, and their reliability and validity should be assessed. Also there was a need to perform deep analysis for various

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groups: like age-specific, gender-wise, urban-rural wise etc. Moreover, few studies that have assessed the RMDQ through Rasch analysis found that there are mis-fitting items in the original 24-item version (Grotle et al; 2013), So in this study Rasch analysis will also be performed.

Objectives of the Study

The objectives of current study are:

(i) To evaluate the reliability of three questionnaire for patients of urban and rural areas of Peshawar district.
(ii) To perform Rasch analysis for RMDQ, ODI and PSEQ for LBP at district Peshawar.
(iii) To find out the association of LBP with different socio-demographic characteristics of the study are analysis group-wise like age-groups, gender-wise, urban-rural wise etc.
(iv) To find out the most significant factor which are badly influence by LBP.

Material and Methods

The three questionnaires RMD, ODIQ and PSEQ were used to collect the data from the patients having low back pain .These questionnaires were all in English language and face to face interviews were conducted to get the relevant information from the LBP patient. These patients (both male and female having age more then25) were selected randomly from the orthopedic department of Khyber Teaching Hospital Peshawar, KP. The study period was started from July to December, 2015.

Sample size

As the preparation of complete sampling frame of patients having low back pain in Peshawar district is not possible, so for determining the sample size, literature was studied to decide about the sample. Forexample, Jirarattanaphochai et al(2005) selected 120 patients for the Thai version of RMDQ for the evaluation of low back pain patients. Similarly, (Beurskenset al 1995) selected 81 patients for the responsiveness of functional status in the low back pain, and performed comparison of different instruments, while Mousavisj et al (2006) studied200 patients for The Owestry Disability Index and the Roland Morries Disability questionnaire Iranian versions. On the basis of these researches, a sample size of **300** patients complaining of low back pain was fixed to en-roll in the study. Patients from both urban and rural regions as well as male and female are considered in the study. No written consent was needed, but oral consent was obtained from patients History and information of each patient was noted and given the questionnaires to mark them according to their pain condition. Patients that were unable to read or write (in case of illiterate or blind), were asked verbally and the questionnaires were marked according to their answers. The data is analyzed via SPSS software (version 20; SPSS, Chicago, Illinois) and R language package "eRm".

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Reliability Analysis

The term reliability in psychological research refers to the consistency of a research study or measuring test. For example, if a person weights themselves during the course of a day they would expect to see a similar reading. Scales which measured weight differently each time would be of little use.

Types of Reliability

There are basically two types of reliability i-e , internal and external reliability. The internal reliability extend to which a measure is consistent within itself. The Split half method measures the extent to which all parts of the test contribute equally to what is being measured.

The external reliability extend to which a measure varies from one to another. The test-retest method assesses the external consistency of a test. Examples of appropriate tests include questionnaires and psychometric tests. It measures the stability of a test over time.

The inter-rater reliability to the degree to which different rates give consistent estimates of the same behavior. This refers to the degree to which different raters give consistent estimates of the same behavior. Inter-rater reliability can be used for interviews.

Internal consistency reliability entails correlation of items in a test. It is used in psychometrics to make certain that entire test items measure alike variable. Internal consistency is considered in Cronbach's alpha coefficients ranging from 0 – 1. Cronbach's alpha measures overall correlation among items within a scale. The higher the coefficient value, the higher the reliability and the lower the standard error of measurement. Reliability is considered acceptable for group comparison when coefficient exceeds Nunnally's criterion 0.7(Nunnally, 1978). It is important that the reliability is good and that repeated measures in individuals remain stable over time, in the absence of treatment. Cronbach's alpha is a statistic. It is normally used as a estimate of internal consistency or reliability of a psychometric tool.

The Cronbach's-alpha test which is used for measurement of internal consistency Initially, Kuder and Richardson (1937) devised Cronbach's-alpha test for dichotomy scored data (0 or 1) which was subsequently generalized by Cronbach for any scoring technique. The theoretical value of alpha varies from 0 to 1, since it is the ratio of two variances. However, depending on the evaluation method used, estimates of alpha can take on any value less than or equal to 1, including negative values, although only positive values make logic Higher Values of alpha are more desirable. Some professionals, as a rule of thumb, require a reliability of 0.70 or high (obtained on a substantial sample) before they will use an instrument.

The alpha value is calculated by the following formula:

$$\alpha = \frac{n}{n-1}\left(1 - \frac{\sum V_i}{V_{test}}\right)$$

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In the above equation 3.2.1, "n" indicates number of questions, V_i indicates variance of scores on each question and V_{test} is for the total variance of overall scores on the whole test.

A commonly accepted rule of thumb for describing internal consistency is if $\alpha \geq 0.9$ then Excellent internal consistency, when $0.9 > \alpha \geq 0.8$ shows Good internal consistency,$0.8 > \alpha \geq 0.7$ shows acceptable consistency and $0.7 > \alpha \geq 0.6$ shows questionable consistency, $0.6 > \alpha \geq 0.5$ shows Poor consistency, and $0.5 > \alpha$ is Unacceptable consistency.

Rasch Analysis

Rasch analysis is a tool which can determine whether a questionnaire measures only a single construct (uni-dimensionality), such as activity limitation whether it contains questions on activities whose difficulty levels are evenly spaced and whether it determines if these properties are constant across age, gender and other clinical variables (referred to as person factors). In Rasch analysis, the item (category) difficulty parameter (eta) with 0.95 confidence intervals and item difficulty parameter Beta with 0.95 confidence interval will be calculated. The estimates of all the items will be calculated with stander error and lower, upper limits. Moreover, the ICC plot for all of the Items of RMDQ, ODQI, and PSQE calculated.

Results and Discussions

This chapter contains the statistical analysis of the primary data regarding patients having low back pain in Peshawar district. Three questionnaires RMDQ, ODI and PSEQ were used to collect the data from the patients having low back pain. Also face to face interviews were conducted to get the relevant information from the LBP patient having age more than25 years. These patients were selected randomly from the orthopedic department of Khyber Teaching Hospital Peshawar, KP during the period July to December, 2015. In statistical analysis different statistical tools like frequency table, graphs, reliability analysis and Rasch analysis were used.

The table-1 shows the age distribution of the patients of LBP. It reveals that out of 300 patients, 15 patients of the LBP in the age group of 30-35 years with the percentage of the 5 respectively. Table showed that number of the patients of LBP increases as the age increases. There of found maximum number of the patients in sample i.e. 51 in the age groups of 55-60 years with the percentage of 17.3. Also, the results showed that maximum patients of the LBP at the age of 65-75 with the frequency of 110 with the cumulative percentage of 36 respectively. The gender wise frequency distribution of 300 LBP patients indicates that out of 300 samples of patients, 114 male and 186female with the percentage of 38 and 62 respectively. The table also infers that the LBP found more in female as compare to male. The table also shows area wise frequency distribution of LBP patients. The table shows that out of 300 patients, 135 patients belonged to urban regions of the province while 165 were from rural areas with the percentages of 45 and 55 respectively.

The information of the patients regarding the feeling of the pain showing that, 68 out of 300 patients showed that they do not feeling low back pain with

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percentage of 22.7 while 232 out of 300 patients showed that they feel low back pain with the percentage of 77.3.

Table 1: Descriptive Statistics

		Frequency	**Percent**
Age group	30-35	15	5
	35-40	11	3.6
	40-45	18	6
	45-50	24	8
	50-55	38	12.7
	55-60	51	17.3
	60-65	33	11.1
	65-70	50	16.3
	70-75	60	19.9
	Total	**300**	**100**
Gender	Male	114	38.0
	Female	186	62.0
	Total	**300**	**100.0**
Area	Urban	135	45.0
	Rural	165	55.0
	Total	**300**	**100.0**
Feeling Pain	No pain	68	22.7
	Pain	232	77.3
	Total	**300**	**100.0**

Table-2 indicates the cross tabulation of the gender with the feeling of the pain of the patients. The table indicates that 20 males and 48 females' patients respectively have no pain while 94 males and 138 females' patients respectively having lower back pain. In order to find the association between the gender of the patients and the information about feeling of the lower back pain, a Chi-square test of the independency was performed.

Table 2: Cross table of Gender & feeling pain

Gender	**feeling pain**		**Total**
	no pain	**pain**	
male	20	94	114
female	48	138	186
Total	**68**	**232**	**300**

The table-3indicates the output of the chi-square test and results showed that, there is no association between the gender of patients and the feeling of the pain in lower back as the p-value is more than 0.05.

Table 3: Chi-Square Tests of Association between Gender &Feeling of pain

	Value	**df**	**Asymptotic Significance (2-sided)**

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Pearson Chi-Square	2.753	1	.097

Also to study the strength of association between gender of patients and the feeling of the low back pain, odds ratio was computed from the sample data, the above table 4 indicates the odds ratio or risk estimates of the feeling pain between the male and female patients.

Table 4: Risk Estimate for Gender of the Patients

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Gender (male / female)	.612	.341	1.097
N of Valid Cases	300		

The table-4 defines the odds ratio for gender of patients (male/females), the results showed that females are more exposure to low back pains as compare to men patients by 0.388 times. Also the 95% confidence interval was computed for OR and the 95% confidence limits obtained as ranging from 0.341 to 1.097.

Table 5: Cross tabulation of Area & feeling pain

	feeling pain		
	no pain	pain	Total
Urban	28	107	135
Rural	40	125	165
Total	**68**	**232**	**300**

The above table-5 indicates the cross tabulation of the area of patient with the feeling of the pain of the patients. The table indicates that 28 patients from urban areas Peshawar and 40 patients from the rural areas respectively have no pain while 107 patients from urban and 125 rural patients respectively having lower back pain. In order to find the association between the region of patients and the information about feeling of the lower back pain, a chi-square test of the independency was performed.
The following table-6 indicates the output of the chi-square test and results showed that, there found no association between region of patients and the feeling of the pain in lower back as the p-value is more than 0.05.

Table 6: Chi-Square Tests of Association between area and feeling of pain

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	0.591	1	.471

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Also to study the strength of association between region of patients and the feeling of the low back pain, odds ratio was computed from the sample data, the following table -7 indicates the odds ratio or risk estimates of the feeling pain between the urban and rural patients.

Table 7: Risk Estimate for Gender of the Patients

		95% Confidence Interval	
	Value	**Lower**	**Upper**
Odds Ratio for Area (urban / rural)	.818	.473	1.414
N of Valid Cases	300		

The above table defines the odds ratio for region of patients (urban/rural), the results showed that patients from rural regions are more exposure to low back pains as compare to urban areas patients by 0.188 times. Also, the 95% confidence interval was computed for OR and the 95% confidence limits obtained as ranging from 0.473 to 1.414.

Table 8: Frequency Distribution of sexual life of patients

	Frequency	**Percent**
Normal	71	23.7
normal but causes pain	111	37.0
Nearly Normal	87	29.0
pain prevent	31	10.3
Total	300	100.0

The above table-8 explains the frequency of various aspects of sexual life of low back pain in sample of 300 patients. The table reveals that there were 71 patients out of 300 having “normal sexual life” with the percentage of 23.7. There were 111 patients (37 %) having “normal sexual life but they feel low back pain” while there were 87 patients with the percentage of 29.3 having nearly normal sexual life. Also from the table, it is clear that there were 31 out of 300 patients with the percentage of 10.3 with information that their sexual life being prevented at all.

Table 9: Frequency Distribution of Pain intensity for ODI questionnaire

	Frequency	**Percent**
no pain	68	22.7
mild pain	112	37.3
moderate pain	88	29.3

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	severe pain	32	10.7
	Total	300	100.0

The table-9 explains the frequency of the intensity of low back pain in sample of 300 patients. The table reveals that there were 68 patients out of 300 having “no pain” with the percentage of 22.7. There were 112 patients (37.3 %) having “mild pain” while there were 88 patients with the percentage of 29.3 with the intensity of the “moderate pain”. Also from the table it is clear that there were 32 out of 300 patients with the percentage of 10.7 having severe pain.

The sector diagram-1 indicates the graphical presentation of the intensity of the pain in patients by the ODI questionnaire methods. The larger sector of the pie chart indicates that, in sample there were 37% of the patients with mild pain in their lower back, while 29% of the patients with the moderate level of the pain in their back. The pie chart indicates that 11% of the sample described that they felt severe level of the pain while 23% of the patients indicated that they had no pain in their lower back.

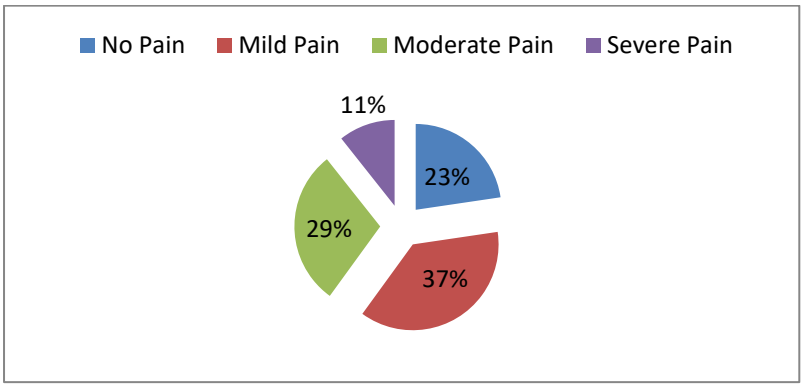

Figure 1: Frequency Distribution of LBP intensity by ODI questionnaire

The above table -10 explains the frequency of various aspects of social life of low back pain in sample of 300 patients. The table reveals that there were 61 patients out of 300 having “normal social life” with the percentage of 20.33. There were 121 patients (40.33%) having “social life but their back pain increasing with” while there were 97 patients with the percentage of 33.0 having restricted social life. Also from the table, it is clear that there were 21 out of 300 patients with the percentage of 6.43 with information that patients have no social life at all.

Table 10: Frequency Distribution of social life of patients

		Frequency	Percent
	Normal Social Life	61	20.33
	Pain increases with social life	121	40.33

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	Restricted My Social Life	97	33.00
	I Have No Social Life	21	6.43
	Total	300	100.0

The table-11 explains the frequency of various aspects of travelling of low back pain in sample of 300 patients. The table reveals that there were 71 patients out of 300 having "can travel anywhere without any pain" with the percentage of 23.7. There were 111 patients (37 %) feel low back pain while travelling" while there were 87 patients with the percentage of 29 showed that patients can walk less than 1 hour with pain. Also from the table, it is clear that there were 31 out of 300 patients with the percentage of 10.3 with information that their travelling being prevented at all.

Table 11: Frequency Distribution of various aspects of travelling

	Frequency	**Percent**
can travel anywhere without any pain	71	23.7
can travel but it gives me pain	111	37.0
pain restricted me to journeys less than one hour	87	29.0
pain prevent me from travelling	31	10.3
Total	**300**	**100**.0

The figure-2 describes the frequency distribution of Low Back Pain while patients are travelling graphically. The chart indicates that maximum of the patients in sample travel with pain while 87 patients can travel less than one hour with pain. Also the 71 patients feel no pain while travel while 31 patients in the sample were restricted to travel due to low back pain.

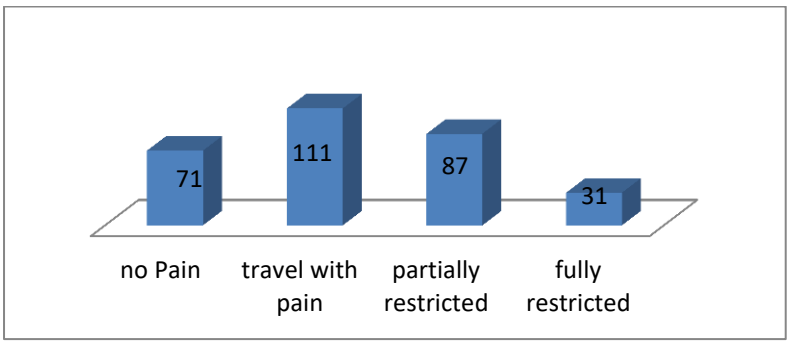

Figure 2: Bar Chart of Low Back Pain while travelling

The above table-12 defines the frequency distribution of stay at home due to Low Back Pain. The tables indicates that out of 300 patients, 85 patients stay at home due to pain while 215 patients do not stay at home even they have low back pain.

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Table 12: Frequency Distribution stay at home due to pain.

	Frequency	Percent
YES	85	28.3
No	215	71.7
Total	300	100.0

Table 13: Cross table of Gender & stay at home

		I stay at home because of my back pain.		
		YES	No	Total
Gender	male	60	54	114
	female	25	161	186
Total		**85**	**215**	**300**

The above table-13 indicates the cross tabulation of the gender with the stay of patients at home due to pain. The table indicates that 60 males and 25 females' patients respectively stay at home due to low back pain while 54 males and 161 females' patients respectively having lower back pain but do not stay at home. In order to find the association between the gender of the patients and their sat at home due to lower back pain, a chi-square test of the independency was performed.

Table 14: Chi-Square Tests of association

	Value	d.f	Asymptotic Significance (2-sided)
Pearson Chi-Square	53.46	1	.000

The above table 14 indicates the output of the chi-square test and results showed that, there found an association between the gender of patients and their stay at home due to pain in lower back as the p-value is less than 0.05.
The table-15 defines the odds ratio for gender of patients (male/females). The results showed that males are more exposure to low back pains as compare to female patients by 6.156 times if they stay at home. Also the 95% confidence interval was computed for OR and the 95% confidence limits obtained as ranging from 4.091 to 12.517.

Table 15: Risk Estimate for gender of patients

		95% Confidence Interval	
	Value	Lower	Upper

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Odds Ratio for Gender (male / female)	7.156	4.091	12.517
N of Valid Cases	300		

Table 16: Cross table of Area and stay at home of patients

Area		I stay at home because of my back pain.		
		Yes	No	Total
	rural	35	101	136
	urban	49	115	164
Total		84	215	300

The table 16 above indicates the cross tabulation of the area of patient with their stay at home. The table indicates that 35 patients from rural areas of Peshawar and 49 patients from the urban areas respectively stay at their home while 101 patients from rural and 115 patients from urban patients respectively do not stay at their home. In order to find the association between the region or area of patients and their stay at home, a chi-square test of the independency was performed.

Table 17: Chi-Square Tests of Independency

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.573	1	.449
N of Valid Cases	299		

The above table-17 indicates the output of the chi-square test and results showed that, there found no association between region of patients and their stay at home having pain in lower back as the p-value is more than 0.05.

Table 18: Risk Estimate Area of Patients

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Area (rural / urban)	.821	.493	1.368
N of Valid Cases	299		

Also to study the strength of association between region of patients and their stay at home having low back pain, odds ratio was computed from the sample data, the above table 4.21 indicates the odds ratio or risk estimates between

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the urban and rural patients having their stay at home. The table defines the odds ratio for region of patients (rural/urban), the results showed that patients from rural regions are less exposure to be at home as compare to urban areas patients by 0.179 times. Also the 95% confidence interval was computed for OR and confidence limits obtained as ranging from 0.493 to 1.368.

Table 19: Nature of walk due to LBP.

	Frequency	Percent
Not Slow	10	3.3
Slow	290	96.7
Total	300	100.0

The table-19 indicates the frequency distribution of nature of walk due to low back pain. The table indicates that there are only 10 patients out of 300 with the percentage of 3.3 do not walk slowly while 290 patients with the percentage of 96.7 walk slowly due to low back pain.

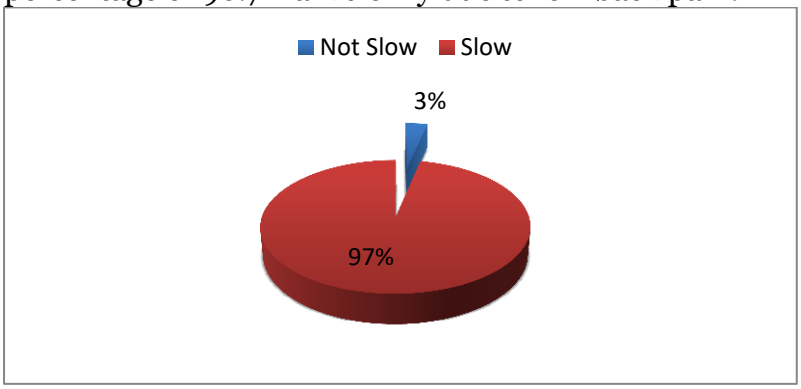

Figure 3: Sector diagram or Pie chart of walk nature due to LBP

The above pie chart is the sector diagram of the nature of walk of patients due to low back pain. The larger sector of the diagram indicates that most of the sample patients walk slowly due to low back pain with a percentage of 96.7 while only 3.3 percent of the patients walk not slowly due to low back pain.

Table 20: Not routine work due to LBP

	Frequency	Percent
No	77	25.7
Yes	223	74.3
Total	300	100.0

The table-20 describes the frequency distribution of doing work due to low back pain. The tables explains that 77 out of 300 patients performed routine

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work due to low back pain while 223 patients do not perform their routine work due to low back pain with the percentage of 74.3.
The following table 20 indicates the cross table of the patients' stay at home due to pain and performing the routine works. The table defines that there were 18 patients and performed not routine activities while there were 67 patients performed no activities respectively while their stay at home. The table also reveals that 58 patients performed no routine job due to low back pain while 157 patients not performed any routine activity having not stayed at home.

Table 21: Cross table of stay at home and not performing routine job

		Not Performing routine job		
		No	**Yes**	**Total**
Stay at home due to LBP	Yes	18	67	85
	No	58	157	215
Total		76	224	300

	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	.981	1	.322
N of Valid Cases	300		

In order to find the association between the stay at home and performing no routine job, a chi-square test of independence was performed. The table 4.25 shows the results of the chi-square test and the analysis showed that the null hypothesis is rejected as the p-value is more than 0.05 and concluded that there is no significance association between staying at home and performing routine jobs.
In order to study the strength of association between the two factors, the risk estimates or odds ratio was computed.

Table 22: Risk Estimate or Odds Ratio

	Value	**95% Confidence Interval**	
		Lower	**Upper**
Odds Ratio for i stay at home due to LBP (Yes / No)	.738	.404	1.348
N of Valid Cases	300		

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The table-22 indicates the results of the risk estimates and the results showed that those patients staying at home are less exposure to perform routine jobs by 0.26 times as compare to those patients no a stay at home. Also 95% confidence interval was computed for the odds ratio and the confidence limits obtained as ranging from 0.404 to 1.348.
In order to find the strength of association between the gender and the stay of patient in the bed due to LBP, the odds ratio was computed.

Table 23: Risk Estimates/Odds ratio

		95% Confidence Interval	
	Value	**Lower**	**Upper**
Odds Ratio for Gender (male / female)	.948	.594	1.513
N of Valid Cases	300		

The above table-23 indicates the results of odds ratio and the table reveals that male patients stay less in the bed due to low back pain as compare to female by the 0.064 times. The 95% confidence interval limits ranging from 0.594 to 1.153.

Reliability Analysis

In order to check the appropriateness of three questionnaires, reliability analysis was performed to each instrument. The reliability statistic calculated from the three questionnaires i.e. RMDQ, ODI and PSEQ. The following table indicates the results of the Cronbach's Alpha, the reliability statistic for each instrument respectively

Table 24: Reliability Statistics of the three questionnaires

Instrument	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
RMDQ	.694	.727
ODI	.920	.920
PSEQ	.724	.734

The table-24 shows the reliability statistics for three instruments. The reliability statistics of RMDQ is 0.694 with total number of items are 24. The value of the statistic indicates that 69.4% of the items of the instrument are valid for measuring the required concept. The reliability statistics for ODI found as 0.920 with the 31 items in instrument, which means that 92% of the items in ODI found valid for the measuring the concept and the instrument is highly reliable whereas for PSEQ cronbach alpha found as 0.724.

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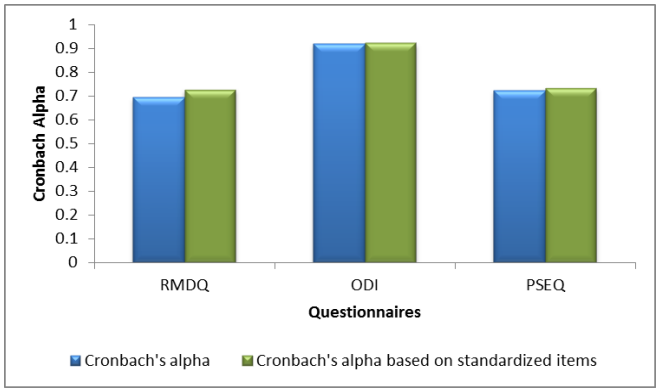

Figure 4: Reliability statistics of the three questionnaires

The figure 4 reveals that the ODI has the high value or maximum reliability i.e. 0.920 which is consider as a best reliability. The RMDQ has the low internal consistency i.e. 0.695 and is consider as acceptable reliability.

Gender-wise Reliability Analysis

In order to study the reliability of the instruments gender wise, Cronbach's Alpha statistics were calculated for both genders from three questionnaire i.e. RMDQ, ODI, and PSEQ the results are discussed as follow:

Table 25: Gender wise Reliability Statistics of LBP patients

Questionnaires	Gender	Cronbach's Alpha
RMDQ	Male	.67
	Female	.69
ODI	Male	.910
	Female	.923
PSEQ	Male	.700
	Female	.752

In the above table 25, the reliability statistics were calculated gender wise for three questionnaires and reliability statistics of ODI found maximum among three instruments for both male and female as compared to RMDQ and PSEQ. The reliability Statistics of male is 0.910 and female is 0.923 respectively. The reliability statistics of PSEQ is 0.700 for male and 0.752 of female. The reliability of RMDQ found for male and female as 0.67 and 0.69 respectively.

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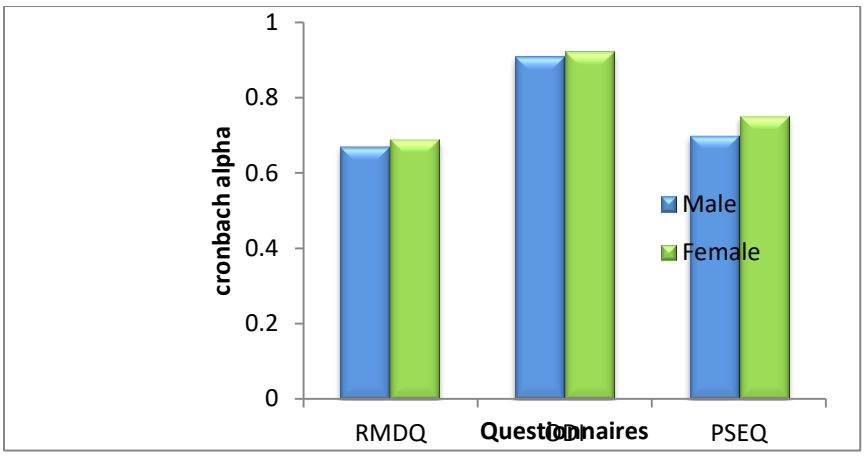

Figure 5: Gender wise reliability Statistics of LBP patients

Figure 5 shows that the reliability of ODI is high and in gender wise reliability the female reliability is more than the male reliability. In the figure 4.9 it is clear that the RMDQ reliability is less for male and female both. From the figure we can conclude that the female reliabity is good as compared to male reliability.

Area-wise Reliability Analysis

The reliability statistics were also calculated different region/areas of patients. The reliability statistics were calculatedfor three questionnairesi.e.RMDQ, ODI and PSEQ area-wise and the results are discussed in the following table respectively

Table 26 Area wise Reliability Statistics for three questionnaires

Questionnaires	Area	Cronbach's Alpha
RMDQ	urban	0.66
	rural	0.715
ODI	Urban	0.893
	rural	0.937
PSEQ	urban	0.772
	rural	0.759

The table-26 shows the results of the reliability statistics for urban and rural areas of patients' for three questionnaires and the cronbach alpha value of ODI found as 0.893 of urban and 0.937 of rural respectively. The reliability statistic for RMDQ found as 0.66 of urban area and 0.715 of rural area respectively. Also for PSEQ, the value of the statistic found as 0.772 and 0.759 for urban and rural areas respectively.

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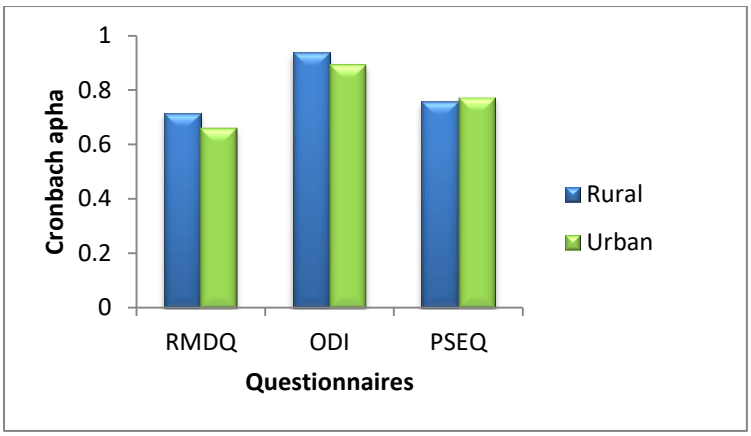

Figure 6 : Area wise Reliabilty Statistics of LBP patients by three questionnaires

The figure 6 shows that the results of area wise reliability statistics of three questionnaires. It is clear from the figure that the ODI cronbach alpha value is maximum and best for both rural and urban area as compared to RMDQ and PSEQ.

The Intra-class correlation coefficient

The intra-class correlation coefficients are also calculated from the three questionnaires RMDQ, ODI and PSEQ. In the intra-class correlation table the 95% confidence interval and F- test is also calculated and values are given in the table-27 below:

Table: 27: Intra-class correlation with F-test of three questionnaires

Questionnaires		Intra class Correlation	95% Confidence Interval		F Test with True Value 0			
			Lower Bound	Upper Bound	Value	df1	df2	Sig
RMDQ	Single Measures	.026	.017	.038	1.647	290	6670	.000
	Average Measures	.393	.288	.489	1.647	290	6670	.000
ODI	Single Measures	.535	.491	.582	12.515	299	2700	.000
	Average Measures	.920	.906	.933	12.515	299	2700	.000
PSEQ	Single Measures	.208	.202	.213	3.619	15485	139365	.000
	Average Measures	.724	.717	.730	3.619	15485	139365	.000

The table-27 shows the intra-class correlation of the three questionnaires and the RMDQ has the single measure 0. 026 and the average measure is 0.393·Same as the ODI has the intra-class correlation for single measure is

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0.535 and intra-class correlation for average measure is 0.920. The intra-class correlation of the third questionnaire i.e. PSEQ is 208for single measure and .724 for average measure.
All the three intra class correlation shows that the ODI results are better than the RMDQ and PSEQ.95% confidence interval is calculated for the three questionnaires in the table 4.9 and also F-test with true value 0 is calculated.

Rasch Analysis of RMDQ
The Rasch analysis is applied on the data sets of three questionnaires i.e. on RMDQ, ODI and PSEQ separately. To identify the level of challenge for a patients performing the activities that were designed from RMDQ, ODI and PSEQ, the item difficulty were examined. In table 28the item (category) difficulty parameters (eta) with 95% confidence interval are tabulated for each item of RMDQ.

Table-28:Rasch analysis for dataset of RMDQ

Item (Category) Difficulty Parameters (eta) with 0.95 CI				
Item	**Estimate**	**Std. Error**	**lower CI**	**upper CI**
Change_ position	-1.122	0.229	-1.570	-0.674
walk_slowly	-1.863	0.313	-2.476	-1.249
No_job	0.496	0.138	0.226	0.766
Handrail	-3.506	0.682	-4.842	-2.170
Lie_down	-0.342	0.172	-0.678	-0.005
Hold_on	-0.794	0.201	-1.188	-0.401
Other_people	0.671	0.133	0.410	0.932
Dressing	0.325	0.143	0.046	0.605
stand_up	-1.863	0.313	-2.476	-1.249
Blending	-1.126	0.228	-1.574	-0.678
get_out	0.422	0.140	0.148	0.696
pain_all_time	0.851	0.130	0.597	1.105
turn_over	-0.714	0.195	-1.096	-0.332
Appetite	1.511	0.123	1.270	1.753
Trouble	0.722	0.132	0.463	0.981
Walk	1.021	0.127	0.773	1.270
Sleep	1.111	0.126	0.864	1.357
dressed_with_help	1.036	0.127	0.788	1.285
sit_down	1.427	0.123	1.185	1.669
Avoid	-0.121	0.160	-0.436	0.193
Irritable	1.299	0.124	1.056	1.543
go_upstairs	-1.863	0.313	-2.476	-1.249
stay_in_bed	1.791	0.124	1.549	2.034

From table 28, it is clear that the highest estimate of eta (item difficulty) (strong trait of disability) is for the question "stay in bed because of my back pain", which is 1.791 with standard error 0.124. The upper and lower confidence limits of this item are 1.549 and 2.034 respectively, which does not

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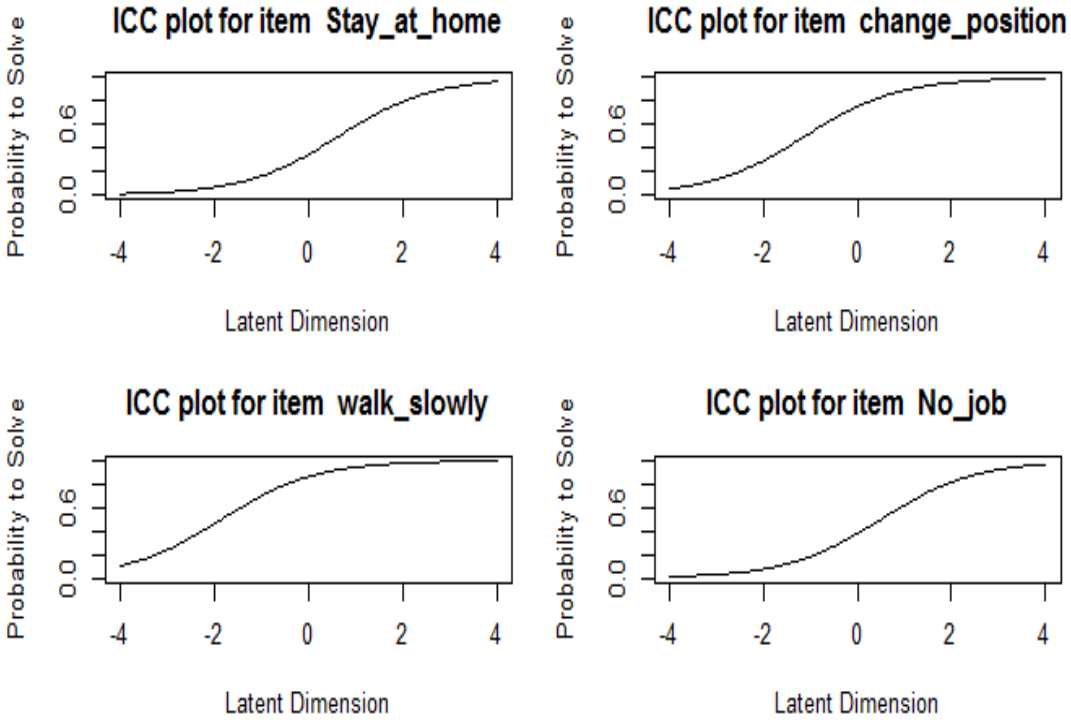
include zero. Similarly, the "My appetite is not very good because of my back pain", "I walk more slowly than usual because of my back", "I sleep less well because of my back", "Because of my back pain, I get dressed with help from someone else", "I sit down for most of the day because of my back" and "Because of my back pain, I am more irritable and bad tempered with people than usual" all have estimates of values greater than one, and their confidence interval do not contain zero, which means these are significant and the patients who have low back pain feels greater difficulty in doing these tasks.



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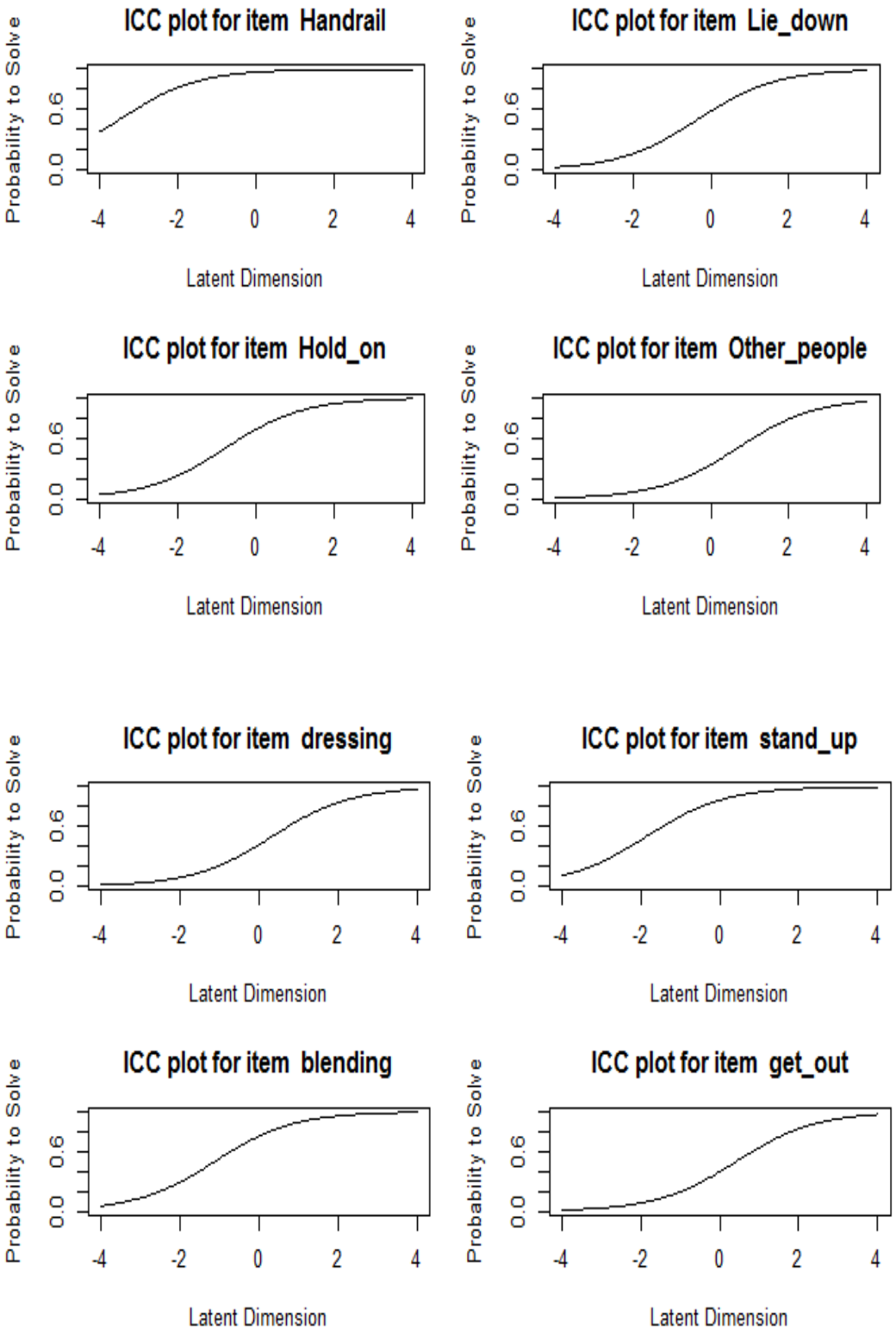

Figure 7: The ICC plot for all of the RMDQ items (Contd)

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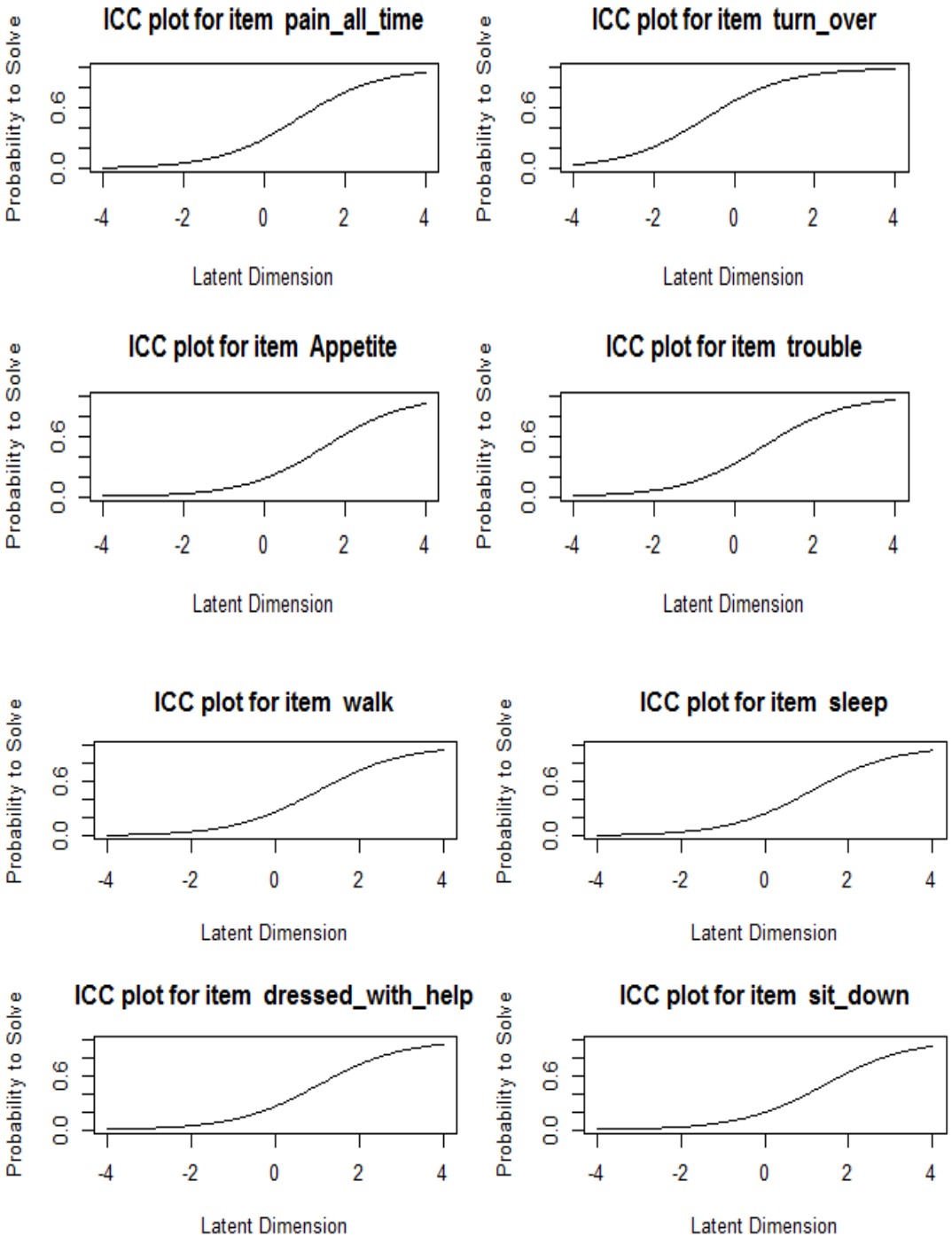

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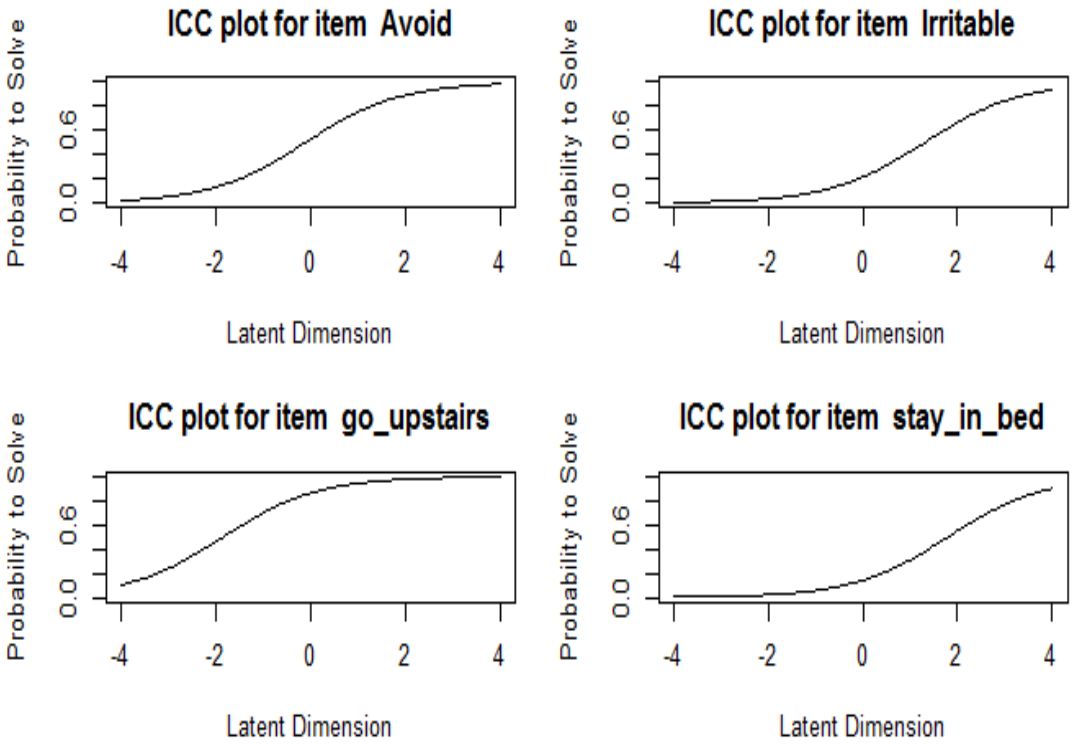

Figure 8: The ICC plot for all of the RMDQ items

The ICCs (Item Characteristic Curves) are plotted for each item of RMDQ in Figure 7. The ICC shows the probability of a correct response as a function of the ability of persons in doing a work. ICC indicates the change in probability of a successful response for a person with ability location at zero. The person is likely to respond correctly to the easiest item (with location to the left and higher curves) and unlikely to respond correctly to difficult items (locations to the right and lowest curves). The leftmost ICCs in Figure 8 are the easiest items; while the rightmost items in the same figure are the most difficult items. The same conclusions can be drawn.

Rasch Analysis of Owstry Disability Index (ODI)

The Rasch analysis is applied on the data set ODI. To identify the level of challenge for a patient performing the activities that were designed from ODI, the item difficulty were examined. In table 29, the item (category) difficulty parameters (eta) with 95% confidence interval are tabulated for each item of ODI.

Table 29:The ODI estimates of eta by Rasch analysis

Item (Category) Difficulty Parameters (eta) with 0.95 CI				
Items	**Estimate**	**Std. Error**	**lower CI**	**upper CI**
Pain_Intensity.c2	-0.699	0.214	-1.118	-0.281
Pain_Intensity.c3	1.844	0.289	1.278	2.411
Personal_care.c1	-1.373	0.187	-1.739	-1.008
Personal_care.c2	-0.650	0.213	-1.068	-0.233
Personal_care.c3	1.886	0.289	1.320	2.452
Lifting.c1	-1.368	0.187	-1.734	1.001
Lifting.c2	-0.669	0.213	-1.086	-0.253

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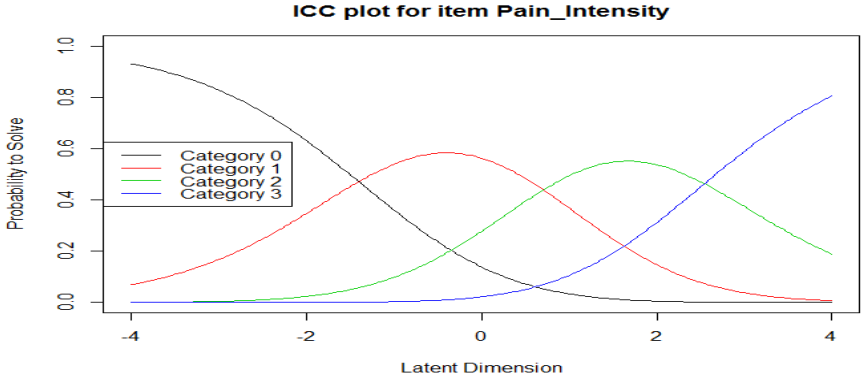
Lifting.c3	1.875	0.289	1.310	2.441
Walking.c1	-1.338	0.186	-1.702	-0.974
Walking.c2	-0.621	0.212	-1.036	-0.205
Walking.c3	1.916	0.288	1.352	2.481
Sitting.c1	-1.343	0.185	-1.707	-0.980
Sitting.c2	-0.609	0.212	-1.05	-0.194
Sitting.c3	1.974	0.290	1.405	2.543
Standing.c1	-1.308	0.185	-1.670	-0.946
Standing.c2	-0.580	0.211	-0.994	-0.166
Standing.c3	2.004	0.290	1.435	2.572
Sleeping.c1	-1.308	0.185	-1.670	-0.946
Sleeping.c2	-0.580	0.211	-0.994	-0.166
Sleeping.c3	2.004	0.290	1.435	2.572
Sex_life.c1	-1.308	0.185	-1.670	-0.946
Sex_life.c2	-0.580	0.211	-0.994	-0.166
Sex_life.c3	2.004	0.290	1.435	2.572
Social_life.c1	-1.308	0.185	-1.670	-0.946
Social_life.c2	-0.580	0.211	-0.994	-0.166
Social_life.c3	2.004	0.290	1.435	2.572
Travelling.c1	-1.308	0.185	1.670	-0.946
Travelling.c2	-0.580	0.211	-0.994	-0.166
Travelling.c3	2.004	0.290	1.435	2.572

From table 29, it is clear that the highest estimate of eta (item difficulty) (strong trait of disability) are for the questions "standing.c3", "Sleeping.c3", "Sex_life.c3", "Social_life.c3", and "Travelling.c3", which is 2.004with standard error 0.290. The upper and lower confidence limits of the these item are 1.435 and 2.572 respectively, which does not include zero. Similarly, the item "Pain_Intensity.c3", "Personal_care.c3", "Lifting.c3", "Walking.c3" and "Sitting.c3" all have estimates of values greater than one, and their confidence interval do not contain zero, which means these are significant and the patients who have low back pain feels greater difficulty in doing these tasks.



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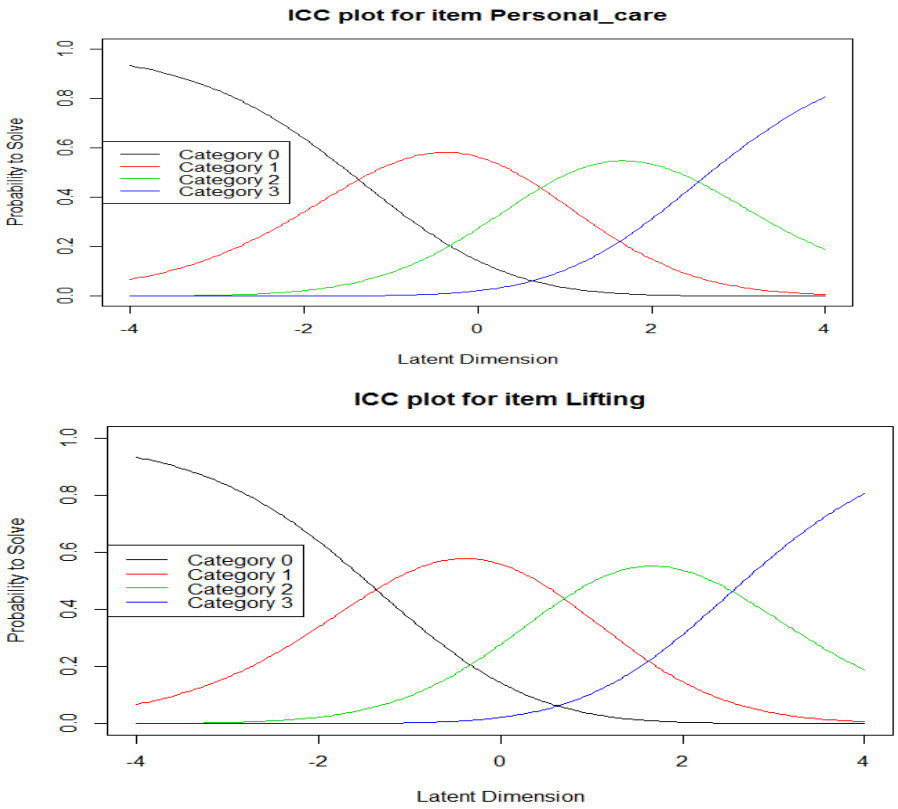
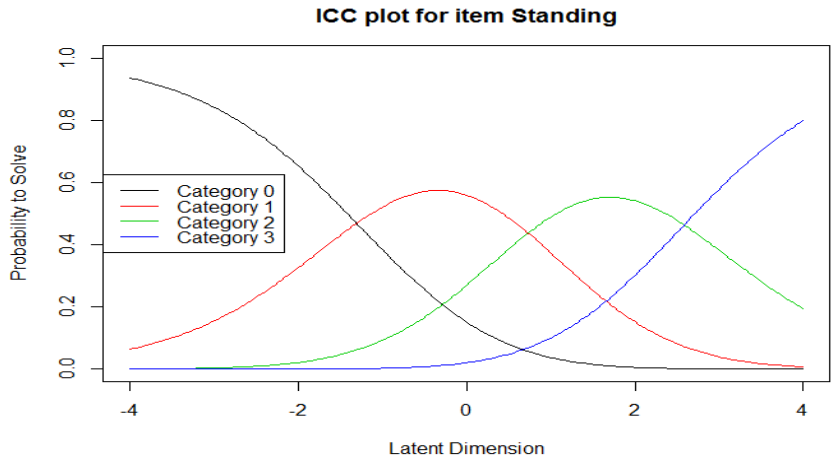


Figure 9 : The ICC Plot of ODI items by Rasch Analysis (Contd.)



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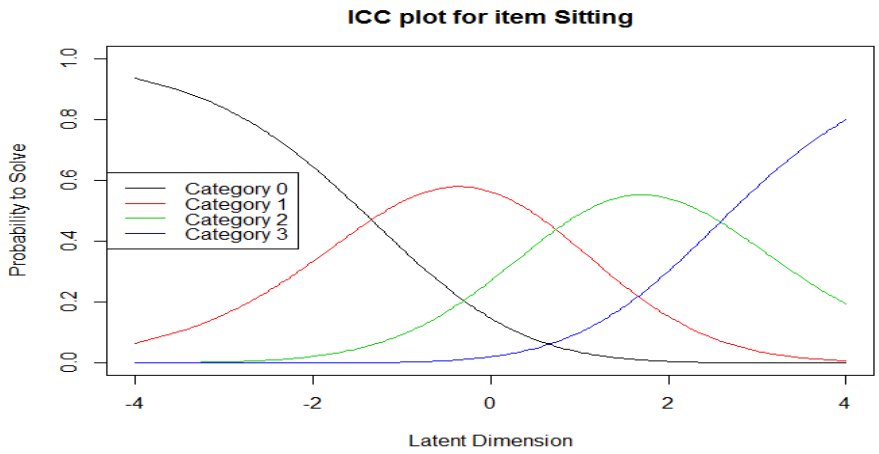

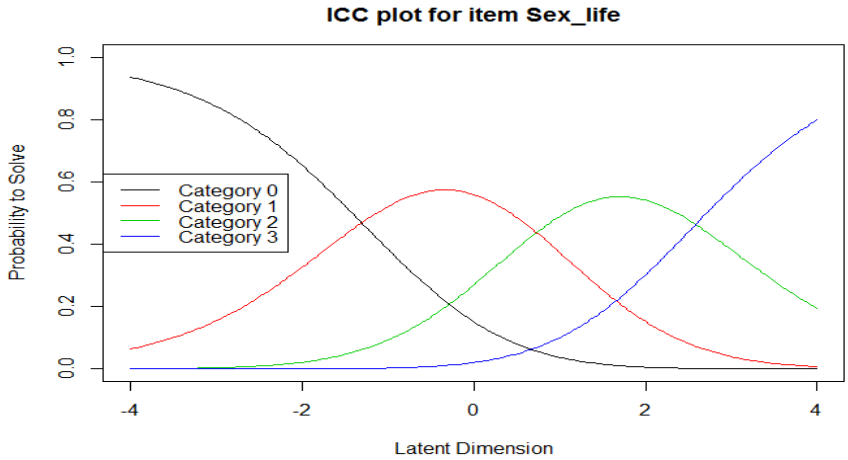

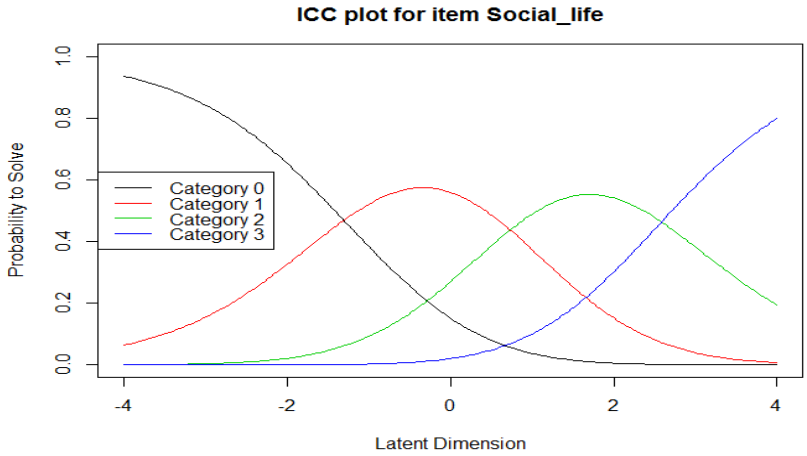

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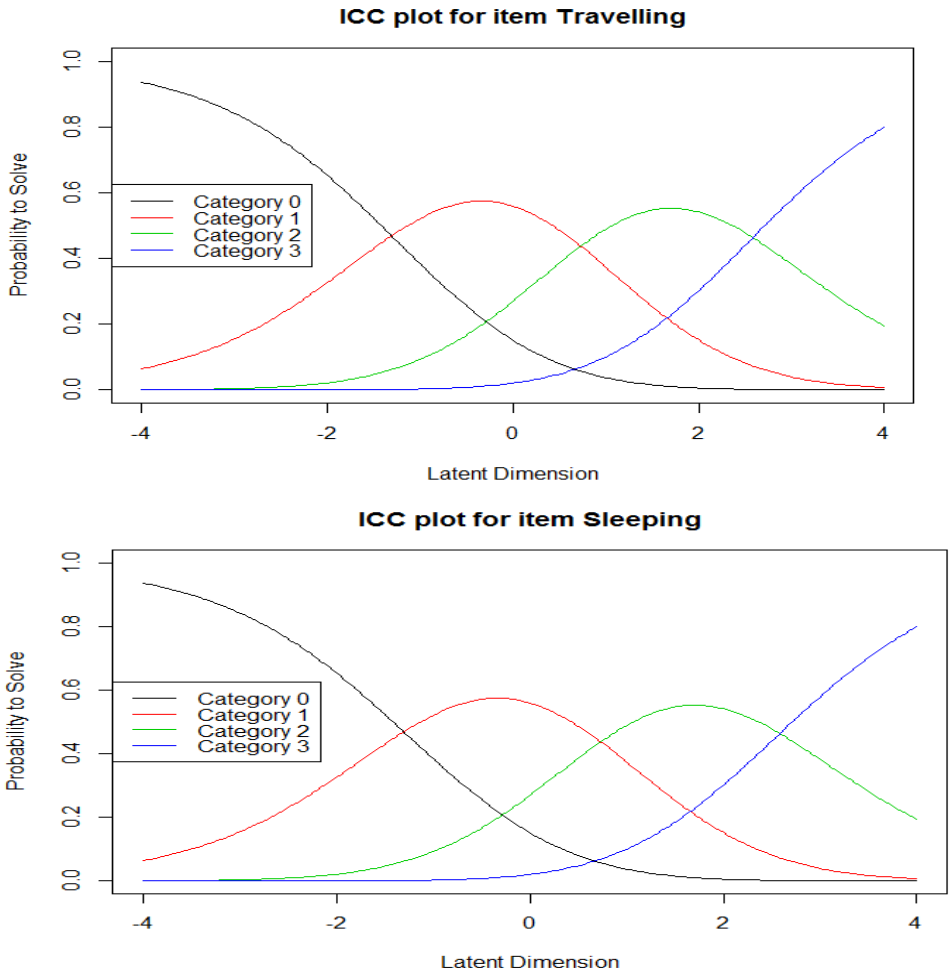

Figure 10:The ICC Plot of ODI items by Rasch Analysis

The ICC (Item Characteristic Curves) are plotted for each item of ODI in Figure 9. The ODI having 10 items and the every item having 4 categories as shown in the ICC plots.The ICC shows the probability of a correct response as a function of the ability of persons in doing a work. ICC indicates the change in probability of a successful response for a person with ability location at zero. The person is likely to respond correctly to the easiest item (with location to the left and higher curves) and unlikely to respond correctly to difficult items (locations to the right and lowest curves). The left most ICCs in Figure 10 are the easiest items, while the rightmost items in the same figure are the most difficult items. The same conclusions can be drawn.

Rasch analysis on the Pain Self Efficacy Questionnaire

The Rasch analysis is applied on the data set PSEQ. To identify the level of challenge for a patient performing the activities that were designed from PSEQ, the item difficulty were examined. In table 30,the item (category) difficulty parameters (eta) with 95% confidence interval are tabulated for each item of PSEQ.

Table 30: The PSEQ estimates of eta by Rasch Analysis

Item (Category) Difficulty Parameters (eta) with 0.95 CI

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Item	Estimate	Std. Error	lower CI	upper CI
HH chores	0.954	0.122	0.715	1.193
Socialize	-1.268	0.190	-1.641	-0.896
Cope	0.495	0.123	0.254	0.737
Some_work	-0.329	0.141	0.604	-0.053
Many_of_things	-0.264	0.138	-0.535	0.008
Without_medication	0.479	0.123	0.238	0.721
Accomplish	0.447	0.124	0.205	0.689
Normal_lifestyle	-0.752	0.159	-1.063	-0.441
Active	0.703	0.122	0.464	0.942

From table 30, it is clear that the highest estimate of eta (item difficulty) (strong trait of disability) is for the question "doing HH chores", which is 0.954with standard error 0.122. The upper and lower confidence limits of the these item are 0.715 and 1.193 respectively, which does not include zero. Similarly, the item "can cope with my pain without medication", "Accomplish most of the works", and "gradually become more active" all have estimates of values greater than zero, and their confidence interval do not contain zero, which means these are significant and the patients who have low back pain feels greater difficulty in doing these tasks.

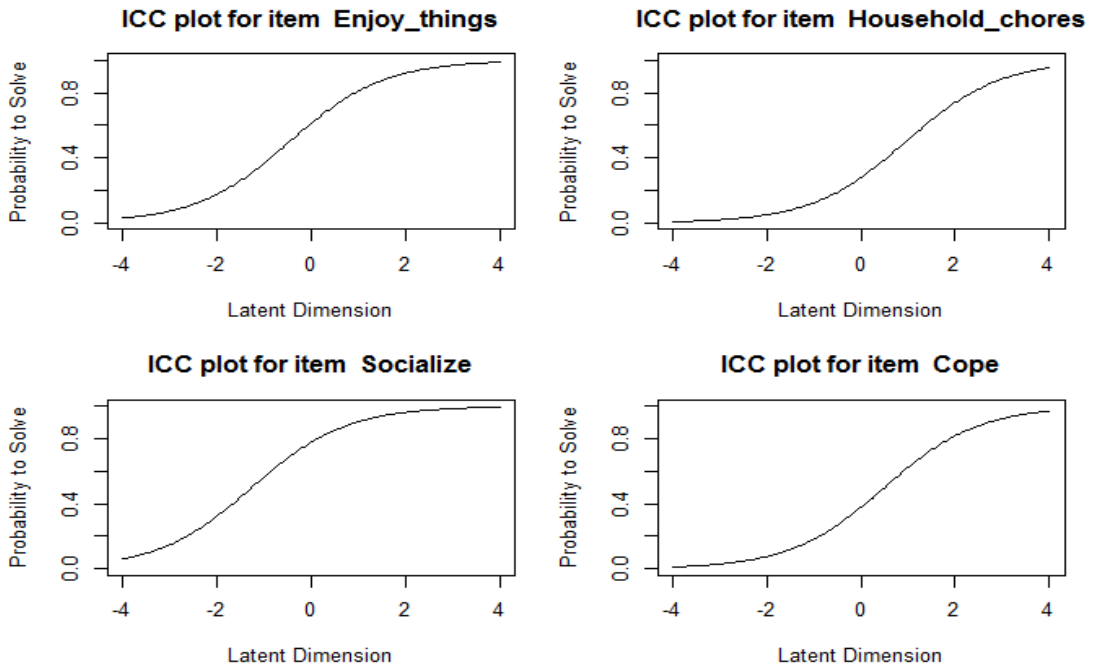

Figure 11: The ICC Plot of all the items of PSEQ by Rasch Analysis (Contd.)

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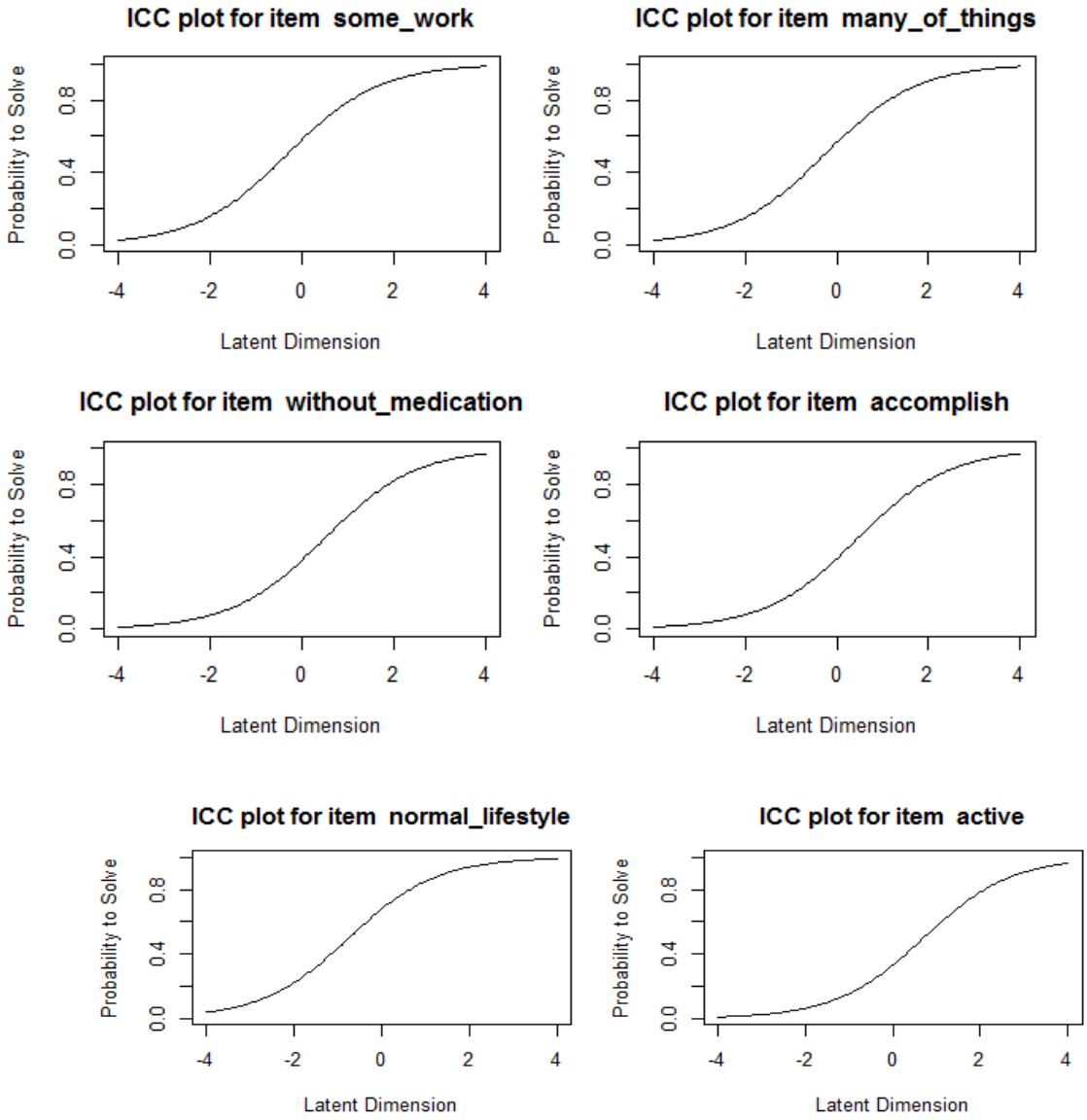

Figure 12: The ICC Plot of all the items of PSEQ by Rasch Analysis

The ICCs (Item Characteristic Curves) are plotted for each item of PSEQ in Figure 11. The ICC shows the probability of a correct response as a function of the ability of persons in doing a work. ICC indicates the change in probability of a successful response for a person with ability location at zero. The person is likely to respond correctly to the easiest item (with location to the left and higher curves) and unlikely to respond correctly to difficult items (locations to the right and lowest curves). The leftmost ICCs in Figure 12 are the easiest items; while the rightmost items in the same figure are the most difficult items. The same conclusions can be drawn.

Summary and Conclusion

Low Back Pain (LBP) is one of the vastly encountered complaints by

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physicians all over the world. There will be no primary caregiver who would not have treated LBP or referred a case for further assessment at the tertiary level. With the current advancements in the ground of evidence-based medicine, much emphasis is given to outcomes of the health care provision. Most of the population worldwide encounters LBP at some stage in their life.

Different types of questionnaires have introduced by researchers with different time related to low back pain. This study attempts to do statistical evaluation of low back pain patient's data through various questionnaires in KP. For this purpose the three types of questionnaires were selected i.e. The Roland Morries Disability Questionnaire, the Oswestry Disability Index and pain self efficacy Questionnaire, used for the testing of the Reliability.

The survey was conducted to different Government hospitals for study about the low back pain patients and finally the Khyber Teaching Hospital was selected because in this Hospital every kind of People or patients visits e,g., the patients of different Areas, the patients of different ages and also gender wise patients were visits in KTH.

The data was collected from 300 low back pain patients and the three questionnaires were filled by every patient, in which 114 were male and 186 were female patients of low back pain. Also out of these 300 patients, 135 were urban and 165 were rural patients of low back pain. The data was collected through three well known Questionnaires.

Descriptive analysis was done by using the bar chart, pie chart and multiple bar charts. The analysis showed that the female patients of low back pain were more than the male patients. The analysis also showed that the rural area patients were more than the urban patients of low back pain and during the study it was noted that this is because of work load and no proper facilities available to the rural area population as compared to urban area population which is the main reason that male and female of rural area are very suffering by low back pain.

The Odd Ratio for Gender of patients, Cross tabulation of Area & feeling pain, the Cross tabulation of Gender & pain , the odd ratio of Area and patients and the chi-square test of association between area, patients gender and feeling pain is calculated.

The Cronbach Alpha test was applied to all the three questionnaires and the calculated reliability statistics of the RMDQ was 0.694, the reliability statistics of ODI was 0.920 and the reliability statistics of the PSEQ was 0.724. The results showed that the ODI has the best reliability then the PSEQ and RMDQ. Similarly, gender wise reliability was also calculated for all the three questionnaires and the reliability of RMDQ male patients was 0.67 and for female patients was 0.69,reliability of ODI for male was 0.910 and for female was 0.923, and the gender wise reliability of third and last questionnaire i.e. PSEQ for male was 0.700 and for female was 0.752. All the gender wise reliabilities of females are greater than the male reliabilities of RMDQ, ODI, and PSEQ. And in the gender wise comparison of three questionnaires the reliability statistics of ODI was excellent than RMDQ and PSEQ.

The Rasch Analysis also applied for the three questionnaires. The estimates of eta statistics were calculated for every item of the questionnaires, their standard errors, 95% confidence interval and the results of Rasch analysis

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were also presented by the ICC plot of each item of the three questionnaires.
From the Rasch analysis of RMDQ, it is clear that the highest estimate of eta (item difficulty) (strong trait of disability) is for the question "stay in bed because of my back pain", which observed 1.791 with standard error 0.124. The upper and lower confidence limits of this item were 1.549 and 2.034 respectively, which does not include zero. Similarly, the "My appetite is not very good because of my back pain", "I walk more slowly than usual because of my back", "I sleep less well because of my back", "Because of my back pain, I get dressed with help from someone else", "I sit down for most of the day because of my back" and "Because of my back pain, I am more irritable and bad tempered with people than usual" all have estimates of values greater than one, and their confidence interval do not contain zero, which means these are significant and the patients who have low back pain feels greater difficulty in doing these tasks.
Also in this study a comparison of three questionnaires were made in the comparison of three questionnaires i-e RMDQ, ODI and PSEQ the ODI give excellent results for all the cases of low back pain patients i-e for age wise , gender wise and area wise. We can say that the ODI is observed as more reliable questionnaire than the RMDQ and PSEQ.

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