PSYCHOLOGICAL WELLBEING SCALE FOR CANCER PATIENTS: REVISED VERSION

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ABSTRACT

Objective: To revise the psychological well-being scale for cancer patients and development of psychometric properties of revised measure.

Study Design: Cross-sectional study.

Place and Duration of Study: Study was carried out at department of Psychology, University of Gujrat, Pakistan over duration of seven months started from Aug 2017 to Feb 2018. Data collected from three different cancer hospitals of Lahore including Shaukat Khanum Memorial Cancer Hospital and Research Centre and Mayo Hospital Oncology department and Institute of Nuclear Medicine & Oncology. Total 255 cancer patients were included in this phase.

Methodology: Sample was selected through the purposive non-probability sampling. Initially, 53 items scale in Urdu language was qualitatively evaluated by 7 subject experts that turned into 51 items after evaluation. Amended scale of 51 items administered on targeted population. Data was analyzed through the descriptive and inferential statistics. Item total correlation method was used to figure out the most correlated items with the following administration of exploratory factor analysis. Scale reliability was explored through Alpha Reliability measure and through the Split half Reliability.

Results: Exploratory factor analysis was carried out for structure detection and data reduction and resulted in to 37 items with four subscales (Familial Support, Feeling of Worry, Cognitive Functioning, and Learned Helplessness). Further item-total correlation was computed to figure out the internal consistency of scale. Alpha reliability coefficient and split half reliability was 0.90 and 0.70 respectively.

Conclusion: After revision, 53 items psychological wellbeing scale turned into 37 items scale with categorization of mild, moderate and severe level of psychological wellbeing in cancer patients.

Keywords: Alpha reliability split half reliability, Cancer patients, Exploratory factor analysis, Psychological well-being.

INTRODUCTION

Cancer is a serious physical illness that leads toward the serious threat to life that brings quite drastic changes into a person's way of life. Normally, human cells grow and divide to form new cells as the body needs them. When cells grow old or become damaged, they die, and new cells take their place. This orderly process breaks down when individual diagnosed with fatal disease of cancerin which cells become more and more abnormal. In state of cancer old or damaged cells stay in body and damage the formation of new cells as well and cells started to divide without stopping and turned into tumors. Cancerous tumors are in form of malignant, which spread into, or invade, nearby tissues. Cancer can start almost anywhere in the human body[1].

World Health Organization presented a global view of cancer, by giving the etiology and biology aspect of cancer with prevention and cancer control programs[2]. General health and wellbeing of cancer diagnosed patients is not only the affected area of diagnosed patients but cancer diagnosis also disrupts the daily routine and establish peculiar relationship with friends and family. The diagnosed cancer patients passed through theadverse stream of emotions while going through the various stages of cancer. Their perception of interpersonal and family relationship gets also changed while passing through the hardship of disease[3]. These negative effects change the perception of cancer patients with

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marked impact on cancer patient's psychological well-being with later on adverse effect on following different prostate cancer treatment strategies[4].

Cancer diagnosis has adverse effect at the individual's psychological well-being, leading towards the depressive and anxiety provoking symptoms, related to psychological distress[5]. Distress further damage the quality of life of diagnosed cancer patients that also effect the wellbeing of caregivers of cancer patients[6]. In some cases, cancer patients have been proven to experience positive changes in their life after the cancer diagnosis, patients changetheir perception into the positive one with effective treatment and with proper care[7]. This positive tendency brings the hope and develop the positive well being among cancer patients that maintain their quality of life and subjective well being throughout the treatment phases[8]. Some researches highlight the role of spiritual wellbeing and concluded that spiritual well being boost up the level optimism and reduces the hopelessness and give the positive effect on the quality of life of cancer patients[9,10].

These positive changes enhance the psychological wellbeing that isone's positive sense of subjective wellbeing. If a person who thinks positively about himself and about his/her life and report positively, is thought to have positive psychological wellbeing. It has been concluded that despite many individual differences in the cause and expression of subjective wellbeing, it can be defined by three central components including satisfaction with present life, relative presence of positive effect and relative absence of negative effect[11].

Different ways are used to evaluate the life of cancer patients. These assessment measures are used to evaluate the emotional state of cancer patients, their judgments related to the way they live their own lives and particular reactions toward differentlife events ruled out[12].

Diagnosis of cancer develop the feeling of loneliness, depression; psychosocial distress, changes in sexuality and body image, feeling of shock, anger, renewed fear of death and dying, spiritual crises, hopelessness and uncertainty over the future. All these experiences can affect the psychological well-being of cancer patients[13].

Cancer is major worldwide problem. Every year nearly six million new cases are diagnosed and more than four million dies, this accounts ten percent of total deaths. Estimated incidents of cancer in developing countries are 180 per 100,000 persons[1]. A research was conducted[14] to explore the psychological effects of cancer on diagnosed cancer patients that tinted the life-threatening psychological problems. Further study revealed the major contribution of medical professionals in cure of cancer patients is the treatment with care and concern that boost up the psychological wellness. On follow ups, professionals investigate the psychological issues and enable their patients to deal with illness in better way[15]. But to move on the part of psychological management there is a need of standardized instruments that could screen out psychological wellness.

A significant research work[16] stressed at the importance of psychological assessment measures. Study concluded that most of cancer patients consult with medical physicians at terminal stage of disease with hopelessness. There is a dire need to screen out the positive aspects of patients as most of instruments that has been developed in Pakistan mainly focused to screen out the level of depression and anxiety. By considering the dire need of assessment measure that could screen out the strength of cancer patients an indigenous scale was developed in 2003 through the literature review and by conducting the interview with cancer patients[17]. Total 53 items scale was established by focusing on content validity that elicited the five domains of Psychological Wellbeing. The developed scale of psychological wellbeing resulted in validation issues. The current study aimed to revise the psychological wellbeing scale and to establish the norms by eliciting the psychometric properties to develop a reliable and valid instrument to

measure the psychological wellbeing of cancer patients. The revised version of psychological wellbeing scale for cancer patients will help the professionals to evaluate the level of psychological wellbeing of cancer patients. Revision took place to understand the current phenomenon of psychological wellbeing and to make the initial scale more reliable and quicker for administration. As in practices it was difficult to administer such lengthy instruments.

Study aimed at the revision of the psychological wellbeing scale for cancer patients and the establishment of psychometric properties of revised version. The revision included rephrasing of items statements and get it evaluated by subject experts.

METHODOLOGY

Cross sectional study was conducted in three hospitals including Shaukat Khanum Memorial cancer hospital and research center and from Mayo Hospital, Oncology department and Institute of Nuclear Medicine and Oncology Lahore (INMOL) situated at Lahore.

Fifty-three itemsscale was given to seven field experts (2=Medical professionals; 5= Psychologist) to evaluate on the basis of items appropriateness. Suggestions regarding the items modification were incorporated that resulted in 51 items pool.

Total 255 cancer patients were included in this phase. Sample with age range from 16-90 years old become the part of study. Sample was selected through purposive sampling technique by using the cross-sectional research design.

- Only diagnosed cancer patients become the part of study.
- Both indoor and outdoor cancer patients were the part of study.
- Patients who visited the oncology department to screen out their illness were not the part of study.
- Individuals below the 16 years of age were excluded from the study.

Cancer patients were approached after the formal approval of high authorities of hospitals. The study purpose was explained to patients and informed consent was taken and confidentiality was assured to the patients. Data analysis was done by using SPSS version 20, Mean ± SD calculated for quantitative variables, frequency and

Table-I: Factor loading of 51 items (n=225).

Item No.	Familial Support	Feeling of Worry	Cognitive Functioning	Learned Helpless-ness
1	-.022	.826	-.002	.138
2	.181	.000	.705	.086
5	.738	-.041	.205	-.031
6	.826	-.029	.171	-.040
7	-.007	.795	-.057	.142
8	-.031	.639	.037	.168
9	.303	-.040	.690	.058
10	.862	-.029	.166	.003
11	.819	-.067	.085	.048
12	.005	.451	.077	.603
13	-.059	.677	.073	.326
14	.072	.677	-.078	.131
15	.456	-.105	.193	-.017
16	-.005	.260	.048	.747
17	-.077	.798	-.162	.263
19	-.078	.635	.003	.087
21	.042	.414	-.127	.622
23	-.017	.134	.225	.627
25	.836	-.001	.212	-.024
26	-.081	.518	.060	.076
28	.832	.049	.228	-.030
29	.879	.042	.295	.054
30	.231	-.083	.856	.090
31	.295	.011	.818	.080
32	.073	.149	.184	.558
33	.099	.288	-.009	.742
34	-.182	.650	-.209	.400
39	.561	-.053	.338	.152
41	.268	.045	.778	.027
42	.329	-.080	.754	.067
44	-.067	.655	.056	.184
45	.836	.096	.230	.056
46	.348	-.071	.520	-.032
47	.063	.360	-.102	.719
49	.238	-.010	.771	-.102
50	.540	-.231	.230	.334
51	.705	-.076	.238	.037

Extraction Method: Principle Component Analysis, Rotation Method: Varimax with Kaiser Normalization, Rotation Converged in 17 iterations.

percentage were calculated for qualitative variable, factor analysis was done by using principle component method.

RESULTS

A total of 255 cancer patients encompassed at both male (135, 53%) and female (120, 47%) patients with age range of 16-90 years old with mean and SD 40.7 ± 9.7. From sample 17 (7%) patients were unmarried, while, 236 (93%) were married and 2 (0.78%) were divorced. Large proportion of 255 diagnosed cancer patients received no formal education (102, 40% patients), while the educational level of (101, 39.6%) patients was below matric and 52 (20.39%) patients received the education above the matric.

Table-II: Item total correlation of first factor (Familial support) (n=225)

S. No.	Item No.	Correlation With Total Scores
1	5	.756**
2	6	.827**
3	10	.856**
4	11	.793**
5	15	.550**
6	25	.855**
7	28	.849**
8	29	.921**
9	39	.659**
10	45	.849**
11	50	.660**
12	51	.761**

p<0.01**

Table-III: Item total correlation of second factor (Feeling of worry) (n=225).

S. No.	Item No.	Correlation With Total Scores
1	1	.788**
2	7	.797**
3	8	.696**
4	13	.749**
5	14	.704**
6	17	.876**
7	19	.690**
8	26	.622**
9	34	.814**
10	44	.726**

p<0.01**

Factor Analysis

Exploratory Factor Analysis was carried out by using the Principle Component Method.

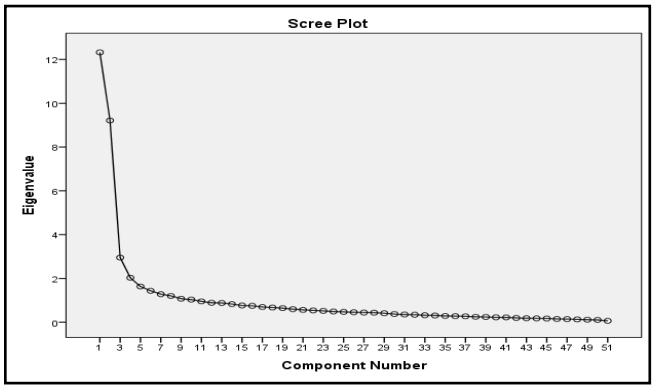

Figure: Scree Plot.

Scree Plot

Above figure indicated the dimensions of extracted factors that represented by the elbow shape. Scree plot represented the eigen values on the Y-Axis (Eigenvalue ≥1) and the number of extracted factors on X-Axis. Four factors before the slope of the curve clearly leveling off the

Table-IV: Item total correlation of third factor (Cognitive functioning) (n=225).

S. No.	Items No.	Correlation with total scores
1	2	.774**
2	9	.786**
3	30	.897**
4	31	.878**
5	41	.797**
6	42	.790**
7	46	.696**
8	49	.780**

p<0.01**

Table-V: Item total correlation of Fourth Factor (Learned Helplessness) (n=225).

S. No.	Item No.	Correlation With Total Score
1	12	.710**
2	16	.786**
3	21	.753**
4	23	.645**
5	32	.676**
6	33	.804**
7	47	.802**

p<0.01**

elbow that represent the separate categories of psychological wellbeing afterwards the label was assigned by looking into the content of extracted items.

Reliability of Psychological Wellbeing Scale of Cancer Patients: Revised version.

Reliability of scale was measured through the reliability measure of Item total correlation, Alpha Reliability (table-VI) and through Split half reliability[18] (table-VII).

Table-VI: Alpha reliability coefficients of four subscales (n=225).

Subscale	No. of Items	Alpha Reliability Coefficient	Significance value
Familial support	12	.93	.9 < α = Excellent
Feeling of worry	10	.91	.9 < α = Excellent
Cognitive functioning	8	.91	.9 < α = Excellent
Learned helplessness	7	.86	.8 ≤ α >.9 = Good

p<0.01

Table-VII: Split half reliability coefficient for four subscales (n=225).

Subscale	No. of Items	Split Half Reliability Coefficient	Significance value
Familial support	12	.849	.8 ≤ α >.9 = Good
Feeling of worry	10	.816	.8 ≤ α >.9 = Good
Cognitive functioning	8	.812	.8 ≤ α >.9 = Good
Learned helplessness	7	.749	.7 ≤ α >.8 = Acceptable

p<0.01

Item Total Correlation

Table-III indicated the internal consistency of scale with particular to the domain of feeling of worry. Generated items represent the acceptable (0.7≤α>0.8), good (0.8≤α>0.9) and excellent (.9<α) range of internal consistency[18]. Items number 8, 19 & 26 become the part of factor through the content validation of this domain.

Table-IV indicated the internal consistency of scale with particular to the domain of cognitive functioning. Generated items represent the acceptable (0.7≤ α >0.8), good (0.8 ≤ α >0.9) and excellent (0.9<α) range of internal consistency[18]. Value of internal consistency of items number 46 is 0.696 which is closer to the acceptable range of internal consistency further it was retained due to the content validity.

Table-V indicated the internal consistency of scale with particular to the domain of learned helplessness. Generated items represent the acceptable (0.7≤ α >0.8), good (0.8≤ α >0.9) and excellent (0.9<α) range of internal consistency[18]. Items number 23 & 32 become the part of factor as the content of both items were valid with particular to the domain of learned helplessness.

Alpha Reliability Measure

Table-VI indicated the reliability

Split Half Reliability Measure

Split half reliability has been mentioned in table-IV.

Cut-off Scores for the final Psychological Well-being Scale

Percentile norms were calculated to determine the cut off scores for low, moderate and high scores on the Psychological Well-being Scale so cancer patients could be screen out who has adequate psychological wellbeing (table-VIII).

Table-VIII: Interpretation of R-PWSC scores.

Category	Raw scores on PWS-R
Low range of Psychological Wellbeing	<111
Moderate range of Psychological Wellbeing	111-139
High range of Psychological Wellbeing	>139

DISCUSSION

Exploratory Factor Analysis was carried out by using the Principle Component Method.

For structure detection and data reduction exploratory factor analysis was carried out by using principle component method.

Initially, the factorability of the 51 items scale was examined. Different well documented crite-

ria for the factorability of a correlation were used. The communalities were all above .3, verifying that each item shared some common variance with other items. Bartlett test of sphericity is a statistical test for the existence of correlation among variables. It provides the statistical significance that correlation matrix has significant correlation among at least some of the variables. Another measure to quantify the degree of intercorrelation among variables and the appropriateness of factor analysis is the Measure of sampling adequacy (MSA). This index ranges from 0 to 1, reaching 1 when each variable is perfectly predicted without error by the other variable. Its value below .5 is unacceptable[11]. In current study Kaiser-Meyer-Olkin measure of sampling adequacy resulted in the good range of .904 which represented that the data was adequate and study results are applicable to the specific population[18]. Further the normality of data was screen out by using the normality estimates of Skewness and kurtosis. These were applied to assess either the results of analysis beyond the sample collected could be generalize[18]. Skewness and kurtosis were found out to estimate the data normality. Value for skewness was between -1 to +1 and kurtosis was within the limit of -3 to + 3, that revealed the true representation of selected sample.

Exploratory factor analysis was used on data of 225 diagnosed cancer patients. Analysis categorized the responses in 10 factors by explaining total 66.9% of variance. Factors were explored through the method of varimax rotation. From analysis four factor solution, which explained 51.9% of the variance, was retained because remaining factor explained only 1 or 2 items. Besides the items which havefactor loading less than .5 were discarded as they did not meet the standard criteria to retain the items[17-19]. In this way, 14 items were discarded and 37 item scale was retained having four factors (table-I).

Four factors of Psychological Wellbeing were interpreted. Factors were assigned label through the expert's recommendation after evaluating the content of explored items within same factor. First factor with 12 items represent the domain of Familial support; the second factor highlighted the feature of feeling of worry with 10 items. Third factor with 08 items was representation of cognitive functioning and the last factor with 07 items was labeled as learned helplessness by considering the content of items.

In following table description of factor loading is presented that highlight the significance value of retained items as well as the factor loading of discarded items respectively.

Exploratory factor analysis reduces the 51 items scale into 37 items by retaining the items who have value greater than .5 to follow the standardized criteria for practical and statistical significance of factor loading[18], that further fixed into four factors by explaining the complex concept of Psychological wellbeing into four factors including familial support, feeling of worry, cognitive functioning and learned helplessness. In domain of familial support items were related to the family support received by the cancer patients from their biological and extended family members, second domain of feeling of worry represented the anxious feelings resulted in response of the fatal disease, third domain of cognitive functioning included the set pattern of thoughts generated in response of the cycle of worry, further cognitive domain screen out the current level of cognitive functioning of cancer patients, and the fourth domain targeted the spectrum of learned helplessness that occurs when cancer patients endures repeatedly painful incidents produced by the chronic illness and patients consider themselves unable to escape or avoid from the aversive stimuli.

Table II indicated the internal consistency of scale with particular to the domain of familial support. Generated items represent the acceptable ($.7 \leq \alpha > .8$), good ($.8 \leq \alpha > .9$) and excellent ($.9 < \alpha$) range of internal consistency[18]. Items number 15, 39 & 50 become the part of factor as the content of these three factors were directly related to the familial support.

Table III indicated the internal consistency of scale with particular to the domain of feeling of worry. Generated items represent the acceptable (.7≤ α >.8), good (.8≤ α >.9) and excellent (.9<α) range of internal consistency[18]. Items number 8, 19 & 26 become the part of factor through the content validation of this domain.

Table-IV indicated the internal consistency of scale with particular to the domain of Cognitive functioning. Generated items represent the acceptable (.7 ≤ α >.8), good (.8 ≤ α >.9) and excellent (.9<α) range of internal consistency[18]. Value of internal consistency of items number 46 is .696 which is closer to the acceptable range of internal consistency further it was retained due to the content validity.

Table V indicated the internal consistency of scale with particular to the domain of learned helplessness. Generated items represent the acceptable (.7≤ α >.8), good (.8≤ α >.9) and excellent (.9<α) range of internal consistency[18]. Items number 23&32 become the part of factor as the content of both items were valid with particular to the domain of learned helplessness.

Cronbach's alpha is a function of the number of items in a test of average covariance between item-pairs, and the variance of the total score[18]. By keeping this method in view the average correlation of all set of items that pertain the Psychological wellbeing was computed. Alpha reliability coefficient for 37 item was 0.90 that resulted in high indices of scale reliability

Table VI indicated that newly developed scale has high reliability, first three domains of psychological wellbeing scale including familial support, feeling of worry and cognitive functioning fall under the excellent range of internal consistency (.9<α)[18], whereas, the forth factor of learned helpless categorize in good range of internal consistency (.8≤ α >.9)[18].

Split half reliability is a consistency method where a test is split in two halves and the scores for each half of the test is compared with one another. If the test is consistent it leads the experimenter to believe that it is most likely measuring the same thing[18]. Split half reliability coefficient for all subscales of revised psychological wellbeing scale was computed and mentioned in table-VII.

The split half reliability coefficient range was from .749 - .849 that indicated the good range of split half reliability.

Percentile norms were calculated to determine the cut off scores for low, moderate and high scores on the Psychological Well-being Scale so cancer patients could be screen out who has adequate psychological wellbeing (table-VIII).

The range of obtained score is between 5th and 95th percentile with values range of 77 to 166, which shows a wide dispersion of score (166-77=88). Score of 124 against 50th percentile is cut off score of psychological well-being scale. Thus, the score of 124 and above may be taken as indicative of positive psychological well-being whereas below 124 will be the indication of negative psychological wellbeing. The later patients will be in greater need of familial support and will be feeling worry. They will have impaired cognitive functioning with feeling of helplessness.

LIMITATION OF STUDY

Sample size was small and was only selected from Lahore City. No specific proportion of type of cancer patients was determined. During data collection distractions in form of noise, hot weather condition and unavailability of proper setting for scale administration was inevitable which might disturb the concentration of respondent. To make the scale more generalized it should be administered to a large representative sample.

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CONCLUSION

After revision, 53 items psychological wellbeing scale turned into 37 items scale with

categorization of mild, moderate and severe level of psychological wellbeing in cancer patients.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

REFERENCES

1. Rajanandh MG, Manicavasagam, Krupa MD. Effect of cancer treatment on cognitive function in patients receiving chemotherapy: A prospective study. J Cancer Sci Res 2018; 5(2): 1-5.
2. Stewart BW, Wild CP. International agency for research on cancer. WHO (2014) World Cancer Report 2014 [Online]. Available from: http://publichealthwell.ie/node/725845
3. Henselmans I, Helgeson VS, Seltman H, Vries J, Sanderman R, Ranchor AV. Identification and prediction of distress trajectories in the first year after a breast cancer diagnosis. Health Psychol 2010; 29(2): 160-68.
4. Lehto US, Tenhola H, Taari K, Aromaa A. Patients' perceptions of the negative effects following different prostate cancer treatments and the impact on psychological well-being: a nation wide survey. Br J Cancer 2017; 116(7): 864-73.
5. Ruini C, Vescovelli F. Post-traumatic growth in breast cancer survivors: new insights into its relationships with well-being and distress. J Clin Psychol Med Settings 2013; 20(3): 383-91.
6. Litzelman K, Kent EE, Mollica M, Rowland JH. How Does Caregiver Well-Being relate to perceived quality of care in patients with cancer? Exploring Associations and Pathways. J Clini Oncol 2016; 67(1): 1-6.
7. Casellas-Grau A, Vives J, Font A, Ochoa C. Positive psychological functioning in breast cancer: an integrative review. Breast 2016; 27(1): 136-68.
8. Tessier P, Blanchin M, Sébille V. Does the relationship between health-related quality of life and subjective well-being change over time? An exploratory study among breast cancer patients. Social Sci Med 2017; 17(4): 96-103.
9. Wang YC, Lin CC. Spiritual Well-being may reduce the negative impacts of cancer symptoms on the quality of life and the desire for hastened death in terminally ill cancer patients. Cancer Nurs 2016; 39(4): 43-50.
10. Pérez, John E, Smith R, Amy. Intrinsic religiousness and well-being among cancer patients: the mediating role of control-related religious coping and self-efficacy for coping with cancer. J Behavior Med 2015; 38(2): 183-93.
11. Folkman S, Greer S. Promoting psychological well-being in the face of serious illness: when theory, research and practice inform each other. Psych Oncology 2000; 9(1): 9-11.
12. Schubart JR, Emerich M, Farnan M, Smith JS, Kauffman GL, Kass RB. Screening for psychological distress in surgical breast cancer patients. Ann Surg Oncol 2014; 21(10): 48-53.
13. Beckjord EB, Reynolds KA, Rechis R. Psychological factors and survivorship: a focus on post-treatment cancer survivors. In: Carr BI, Steel J (eds) Psychological aspects of cancer: a guide to emotional and psychological consequences of cancer, their causes and their management. Boston 2013; 1(1): 327-46.
14. McDonough MH, Sabiston CM, Wrosch C. Predicting changes in posttraumatic growth and subjective well-being among breast cancer survivors: the role of social support and stress. Psychooncol 2014; 23(1): 114–20.
15. Holtmaat K, Van-der-Spek N, Lissenberg-Witte BI, Cuijpers P, Verdonck-de Leeuw IM. Positive mental health among cancer survivors: overlap in psychological well-being, personal meaning, and posttraumatic growth. Support Care Cancer 2019; 27(2): 443-50.
16. Riaz S. Psychological wellbeing and depression in cancer patients. Un published M.Phil Thesis. department of psychology. Quaid Azam University, Islamabad 2003.
17. Hair JF, Black WC, Babin BJ, Anderson RE. Multivariate Data Analysis. 7th Edition, Pearson, New York; 2010.
18. Taherdoost H. Exploratory factor analysis; concepts and theory. Adv Appl Pure Math 2014; 382(1): 375-84.
19. Everitt BS, Dunn G. Applied multivariate data analysis. London: Arnold 2001. 2nd Edition, https://www.worldcat.org/title/applied-multivariate-data-analysis/oclc/44694442