

Statistical Comparison Between Interview Questions and Rating Scales in Psychiatry

ABSTRACT

Background: Psychiatric evaluations consist of both qualitative questions and quantitative assessments, sometimes questioning the same issue. The present study attempts to investigate the statistical equivalency of several close-ended questions of a procedural psychiatric examination and rating scales addressing a similar problem.

Methods: The current retrospective analysis included 314 patients who made their first visit to a private psychiatry clinic. Subjects underwent a routine psychiatric examination, including close-ended questions and related clinical scales. Questions included sleep and sexual problems, problems in marriage, parent relationship problems, and childhood abuse. The related psychiatric scales were Jenkins Sleep Scale, Arizona Sexual Experience Scale, Dyadic Adjustment Scale, and Childhood Trauma Questionnaire, respectively. First, receiver operating curve analysis was conducted for each yes/no question and clinical scale. Then, area under curve sensitivity and specificity values were calculated. Multinomial logistic regression analysis was also performed to observe paired predictor variables.

Results: Among clinical questionnaires, the receiver operating curve model provided good area under curve values as prediction criteria for Dyadic Adjustment Scale (0.78; $P < .001$), Childhood Trauma Questionnaire (0.74; $P < .001$), Childhood Trauma Questionnaire—physical abuse (0.826; $P < .001$), Childhood Trauma Questionnaire—sexual abuse (0.828; $P < .001$), Arizona Sexual Experience Scale (0.796; $P < .001$), and Jenkins Sleep Scale (0.920; $P < .001$). Multinomial logistic regression models also revealed good correct classification values for Dyadic Adjustment Scale—Childhood Trauma Questionnaire (61%), Childhood Trauma Questionnaire—Physical abuse—Childhood Trauma Questionnaire—Sexual abuse (87.6%), and Arizona Sexual Experience Scale—Jenkins Sleep Scale (67%).

Conclusion: When the symptoms are investigated in general terms, the present study reveals that an experienced clinician could rely on clinical questions as much as the quantitative scales in both clinical and research domains.

Keywords: Area under curve, medical history taking, psychiatric examination, regression analysis, symptom assessment

Introduction

Making a general framework for psychiatric evaluation is crucial for making an appropriate diagnosis, detecting optimal treatment strategies, and screening the prognosis. International working groups provide practice guidelines for the psychiatric assessment of adults, published in the third edition and consisting of 7 subguidelines.¹ The first guideline covers the examination of psychiatric symptoms. The remaining sub-guidelines cover substance use, suicide risk, aggressive behavior risk, cultural factors, other medical symptoms, the use of quantitative assessments, involvement of the patient in treatment decision-making, and documentation of psychiatric evaluation, respectively.^{1,2}

In the seventh sub-guideline it has been stated that quantitative assessments of disease symptoms, daily functioning, and quality of life should be included for the psychiatric assessment of adults. However, the research evidence supporting this statement has been argued



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to be relatively low.² In those studies, assessments with and without quantitative scales were compared for diagnostic accuracy, and a modest effect was found in favor of quantitative assessments. These results require weighing the pros and cons of using quantitative assessments in addition to clinical interviews. The main advantages of quantitative assessment are measurement-based care,³ consistent and reliable information,⁴ outcome-informed treatment with a more therapeutic alliance,⁵ and standardization of care.⁶

However, these advantages can reverse depending on the type of clinical scales and patient profile. For instance, some patients may find answering the detailed questions tiresome or find quantitative assessment interviews impersonal, impairing therapeutic alliance. Also, quantitative assessments may not be suitable for some clinical settings. Lastly, other experts suspect that clinical scales have adequate efficiency in clinical evaluation that can outweigh the cons of performing the quantitative assessment.²

In research areas, the use of quantitative scales is common, particularly in making diagnoses, measuring the efficacy of treatments, and calculating the response and remission rates.⁷ However, the overreliance on quantitative assessments in clinical research can lead to overlooking the patients and settings when quantitative scales cannot be implemented. Therefore, studies comparing the equivalence of assessments with and without quantitative scales are necessary. By testing the equivalency of several clinical questions with quantitative scales, the present study tries to address the question of using both scales and the relevant psychiatric question is necessary for a clinical examination.

Material and Methods

Participants

This retrospective study screened the psychiatric medical records of the patients who conducted the first visit to the private psychiatry clinic in İstanbul, Turkey. Patients signed a written informed consent, and the Üsküdar University Non-Interventional Research Ethics Board (Decision No: 61351342/JANUARY 2023-31) approved the study.

A total of 314 patients (142 female and 172 male), aged between 17 and 78 years, were included. All the patients underwent a detailed semi-structured psychiatric examination in accordance with APA practice guidelines for the psychiatric evaluation of adults, third edition.² Patients who had answered the following yes/no clinical questions and who answered the following scales were included in the analysis:

MAIN POINTS

- The classification model was constructed between rating scales and qualitative questions.
- All the associated quantitative scales and qualitative questions have good area under curve values.
- Multinomial logistic regression analysis was performed for paired scales and clinical questions.
- Odds ratios and CIs were in the expected direction of the total scores of all scales.
- The scales and interview questions can be interchangeably used in clinical/research areas.

1. Sleep problem: yes/no
2. Libido problem: yes/no
3. Relationship problem in marriage: yes/no
4. Physical abuse in childhood: yes/no
5. Sexual abuse in childhood: yes/no
6. Parents' relationship problems with each other: yes/no
7. Jenkins Sleep Scale
8. Arizona Sexual Experience Scale
9. Dyadic Adjustment Scale
10. Childhood Trauma Questionnaire
 - a. Childhood physical abuse
 - b. Childhood sexual abuse

Patients who did not answer the clinical questions or did not have scores on the clinical scales were excluded.

Measures

Jenkins Sleep Scale: The scale developed by Jenkins and his team to measure the frequency and severity of sleep problems⁸ is a 4-item Likert-type scale including difficulties in falling asleep, maintaining sleep, and feeling tired after sleep. The person applying the scale asks how often the questions asked during the past month are experienced daily. Scores range from 0 to 5. If the problem was not experienced at all, 0 points were given; 1-3 days experienced 1 point; 4-7 days experienced 2 points; 8-14 days experienced 3 points; 15-21 days experienced 4 points; and 22-31 days experienced 5 points. The team that developed the scale conducted a reliability and validity study and found Cronbach's α to be 0.63-0.79. The internal consistency of the Turkish version, which is translated by Duruöz et al,⁹ provided good internal consistency: Cronbach's α : 0.809.⁹

Arizona Sexual Experience Scale: In order to evaluate the sexual dysfunctions of men and women, the authors developed a 5-point Likert-type scale evaluating sexual desire and sexual arousal, vaginal lubrication/penile erection, and reaching orgasm and satisfaction from orgasm.¹⁰ The scale has 2 versions, each comprising 6 items, scored from 1 to 5.¹⁰ The scale is also adapted to Turkish by Soykan and colleagues.¹¹ The original and Turkish versions provided good internal consistency, i.e., Cronbach's α values were 0.9010 and 0.8911, respectively.^{10,11}

Dyadic Adjustment Scale: Dyadic Adjustment Scale was designed by Spanier and colleagues as 32 Likert-type items.¹² In the scale, the agreed or disagreed items between the couples are given. The person to whom the scale is applied is asked to mark how much he agrees with his partner about the listed topics. Scoring is as follows: 5 (always agree), 4 (almost always agree), 3 (sometimes disagree), 2 (frequently disagree), and 1 (always disagree). The scale was revised and reduced to 14 items by Busby and colleagues.¹³ In both versions, Cronbach's α was calculated as 0.88.^{12,13} The Turkish adaptation of the revised scale was carried out by Bayraktaroğlu and Çakıcı,¹⁴ and similar internal consistency (Cronbach's α : 0.87) was found.

Childhood Trauma Questionnaire: This was first developed by Bernstein and colleagues in 1994. The first version of the scale consisted of 70 questions on a 5-point Likert type.¹⁵ Later, it was shortened to 28 items by the author.¹⁶ Three of the questions are items measuring the minimization of trauma. Patients were asked to rate each item from never true to very accurate. With this scale, the

Table 1. The Difference of Mean Scale Scores Between Groups Categorized by the Answers to the Clinical Questions

Clinical Scale	Clinical Question	Value	n	Mean ± SD	P ^a
CTQ—total	Relationship problem of parents	0: No	203	34.17 ± 10.57	<.001
		1: Yes	111	46.94 ± 18.41	
DAS—total	Relationship problems with marriage partner	0: No	97	60.87 ± 10.33	<.001
		1: Yes	32	47.88 ± 17.53	
CTQ—sexual abuse	Sexual abuse at childhood	0: No	287	5.40 ± 2.22	<.001
		1: Yes	27	10.22 ± 5.64	
CTQ—physical abuse	Physical abuse in childhood	0: No	280	5.84 ± 3.12	<.001
		1: Yes	34	13.91 ± 7.97	
JSS—total	Sleep problem	0: No y	186	1.35 ± 2.68	<.001
		1: Yes	128	10.28 ± 6	
ASEX—total	Sexual desire problem	0: No	202	7.82 ± 5.49	<.001
		1: Yes	98	16.05 ± 9.01	

ASEX, Arizona Sexual Experience Scale; CTQ, Childhood Trauma Questionnaire; DAS, Dyadic Adjustment Scale; JSS, Jenkins Sleep Scale. ^a p < 0.0001

sub-scores on childhood sexual, physical abuse, and physical neglect and a total score were obtained. In addition, adequate internal consistency of the long (Cronbach’s α : 0.74-0.94) version¹⁵ and sufficient criterion-related validity of the short version were reported.¹⁶ Şar and his colleagues¹⁷ did the adaptation of the scale to Turkish. This version also reported sufficient internal consistency (Cronbach’s α : 0.93).¹⁷

Statistical Analysis

First, the mean values of the group with the related problem and the non-existent group were compared. Since each group’s mean and SDs corresponded to the normal distribution according to the Kolmogorov–Smirnov test, the independent sample t-test was used in this comparison.

In the second step, receiver operating curve (ROC) analysis and area under curve (AUC) values, z-test, and sensitivity and specificity values were calculated for each scale. According to the Youden index, cutoff values were also revealed to contribute to the diagnostic validity of this discrimination.

Since the 6 basic clinical questions and their corresponding scales were conceptually meaningful in pairs, i.e., Childhood Trauma Questionnaire (CTQ) and Dyadic Adjustment Scale (DAS), CTQ—physical abuse and CTQ—sexual abuse, Jenkins Sleep Scale (JSS), and

Arizona Sexual Experience Scale (ASEX), paired scales were analyzed together with 2 clinical questions using multivariate multinomial logistic regression analysis. The titles of the clinical interview questions known to be related to each other, i.e., “no problem, one is there, and both,” are re-evaluated as dependent variables. Multinomial logistic regression analyses were performed for the multivariate predictor of their scales. In the multinomial logistic regression analyses, odds ratios (OR) and their CIs were obtained for all scales. The statistical analyses were evaluated with Statistical Package for the Social Sciences version 25.0 (IBM SPSS Corp.; Armonk, NY, USA) program. The significance level was accepted as $\alpha = 0.05$ in all tests.

Results

Descriptive Statistics

As expected, the independent sample t-test revealed that the mean scores of clinical scales, i.e., CTQ, DAS, CTQ—sexual abuse, CTQ—physical abuse, JSS, and ASEX scores, are significantly different between patients who were categorized based on their answers to the close-ended clinical questions related with the clinical scales ($P < .001$) (Table 1).

Receiver Operating Curve Analysis

When the relevant JSS was applied to the sleep problem question in patients who said they had the problem, the classification of the

Table 2. ROC Analysis Results for the Clinical Questions and Their Relevant Scales

Clinical Question	Clinical Scale	AUC	Standard		P	Cutoff	Sensitivity	Specificity
			Error	95% CI				
Sleep problem	JSS—total	0.920	0.016	0.884-0.947	<.001	>4	78.91	89.25
Sexual desire problem	ASEX—total	0.796	0.027	0.745-0.840	<.001	>14	53.06	88.61
Relationship with marriage partner	DAS—total	0.780	0.052	0.697-0.849	<.001	≤ 63	86.21	58.76
Sexual abuse at childhood	CTQ—sexual abuse	0.828	0.041	0.782-0.869	<.001	>7	66.67	96.17
Physical abuse at childhood	CTQ—physical abuse	0.826	0.047	0.779-0.866	<.001	>11	55.88	95.36
Relationship of parents	CTQ—total	0.740	0.030	0.688-0.788	<.001	>37	63.96	78.82

ASEX, Arizona Sexual Experience Scale; AUC, area under curve; CTQ, Childhood Trauma Questionnaire; DAS, Dyadic Adjustment Scale; JSS, Jenkins Sleep Scale; ROC, receiver operating curve.

scale for the presence of the question measured by ROC analysis value was found to be very significant and to have a high AUC value [AUC=0.920; $P < .001$; 95% CI (0.884, 0.947)] (Table 2).

Similarly, high AUC values were also found for the ASEX scale with the sexual desire problem [AUC=0.796, $P < .001$, 95% CI (0.740, 0.840)]; for the DAS scale with the relationship with marriage partner [AUC=0.780, $P < .001$, 95% CI (0.697, 0.849)]; for the CTQ scale with the relationship of parents [AUC=0.740, $P < .001$, 95% CI (0.688, 0.788)]; for the CTQ—sexual abuse with the presence of sexual abuse in childhood [AUC=0.828, $P < .001$, 95% CI (0.782, 0.869)]; and for the CTQ—physical abuse scale with physical childhood abuse [AUC=0.826, $P < .001$, 95% CI (0.779, 0.866)] (Table 2).

Thus, significant and high discrimination AUC values were obtained with the scales we made together with these questions about the relationship of parents, the presence of sleep or sexual problem, or the sexual and physical abuse questions. In addition, in all ROC analyses, significant cutoff values and high sensitivity and specificity values were obtained (Table 2).

Multinomial Logistic Regression

In the first pair, the CTQ and DAS scales were taken as dependent variables for these outcome variables—having none of these problems: “0,” having only 1 of these problems: “1,” or having both problems: “2” —based on the questions on parental relationship and spousal relationship. While at least 1 of the scales was found to be significant, the percentage of discrimination was found to be 61.2% (Table 3).

In relation to the questions on physical or sexual trauma in childhood, CTQ—sexual abuse and CTQ—physical abuse scales were taken as the dependent variables for the outcome variables “0,” “1,” and “2” relating to none, only 1, and both, respectively. While both scales were significant, the percentage of discrimination was 87.6% (Table 3).

In relation to the questions on sleep or sexual problems, JSS and ASEX scales were taken as the dependent variables for the outcome variables “0,” “1,” and “2” relating to none, only 1, and both, respectively. While both scales were significant, the discrimination percentage was 67% (Table 3).

Finally, the ORs and CIs were in the expected direction of the total scores of all scales (Table 3).

Discussion

The present study aimed to answer whether the interested clinical scales and questions are equivalent. Most of the findings affirmed our hypothesis. For example, among clinical interview questions, the absence/presence of sleep problems, sexual problems, relationship problems in marriage, parents’ relationship problems in childhood, physical abuse, and sexual abuse in childhood are equivalent to the cutoff scores in Jenkins Sleep Questionnaire, ASEX, DAS, CTQ, CTQ—physical abuse and CTQ—sexual abuse, respectively.

According to these findings, the studied clinical interview questions have enough sensitivity and specificity of the quantitative scales do have. Thus, we propose that using both questions and quantitative

assessments is redundant in case the interviewer is an experienced psychiatrist. This attitude would be less costly and time-consuming and provide a more personalized therapeutic relationship. As for the research area, we propose that conducting statistical analyses with those qualitative questions could be as strong as the ones with clinical scales. This perspective would bring more patients from various centers in research studies.

One of the limitations that should be addressed is that the clinical questions and the related clinical scales constitute a small portion of the psychiatric interview. On the other hand, sleep problems are a common problem underlying psychiatric and neurological diseases. Libidinal problems are also common symptoms of many psychiatric diseases, such as schizophrenia, depressive disorders, anxiety disorders, eating disorders, and personality disorders,¹⁸ which can result in relationship problems with a partner. Finally, relationship issues between parents and the presence of childhood abuse cover a big part of the psychosocial examination; however, future studies could also test the equivalence of the presence/absence of other symptoms such as cognitive and mood symptoms with their relevant clinical scales. In that case, those measurements would necessitate more specific patient populations, such as patients with depressive disorders for mood symptoms, anxiety disorders for anxious symptoms, or neurological samples for cognitive symptoms. The sensitivity and specificity of our measured questions scales did not depend on the diagnosis of patients; hence, they can be used for most psychiatric patients. On the other hand, the reliability of the yes/no psychiatric questions is questionable, yet structured psychiatric examinations provide good reliability, which includes these questions.

It should also be noted that the yes/no psychiatric interview questions included in this study investigate the presence or absence of relative symptoms rather than measuring the severity of the problem, where the related scales have an advantage. Therefore, the statistical equivalence of interview questions and associated rating scales can be discussed only in the investigation of the problem in general terms rather than the detailed investigation of the problem, such as severity, e.g., severity of childhood abuse, or the specific complaint in the issue, e.g., insomnia among sleep problems. Nevertheless, it could be suggested that the statistically equivalent interview questions can be used in the first step of the examination to investigate which problems exist, and then the relevant scales can be used for measuring the severity or the specific complaints in the existing problems.

In conclusion, it was seen that the quantitative scale equivalents of the qualitative questions could be met in our clinic’s data, with the scales that were asked clinically and that could be associated with each other. An experienced psychiatrist, who conducts psychiatric examination according to the practice guidelines,² could apply the investigated clinical questions or relevant clinical scales reported in this study to the general psychiatric population irrespective of diagnosis. In clinical questions, it would be better to elaborate more abstract ones with examples and ask in close-ended ways to reach high sensitivity and specificity. The clinical question attitude would benefit the clinical setting and the research area. Future studies could replicate these results and test other psychiatric symptoms’ equivalence with their relevant clinical scales in specific diagnoses.

Table 3. Multinomial Logistic Regression Models for Three Paired Variables

Multinomial Logistic Regressions		Model's Correct Classification (%)		n	%	Reference	Scales	B	P ^b	OR	95% CI for OR	
Dependent variable categories	P ^a	None (0)	Only 1 (1)									
Relationship of parents	CTQ—total P = .341	None (0)	61.2	70	22.3	1 vs. 0	Intercept	1.054	.373			
		Only 1 (1)		160	51.0		CTQ—total	0.021	.154	1.021	0.992	1.050
Relationship with marriage partner	DAS—total P < .001	Both (2)		84	26.8	2 vs. 0	Intercept	2.549	.160			
		None (0)					CTQ—total	0.020	.483	1.021	0.964	1.081
Physical abuse at childhood	CTQ—physical abuse P < .001	None (0)	87.6	261	83.1	1 vs. 0	Intercept	-6.228	<.001			
		Only 1 (1)		45	14.3		CTQ—sexual abuse	0.523	<.001	1.687	1.345	2.115
Sexual abuse at childhood	CTQ—sexual abuse P < .001	Both (2)		8	2.5	2 vs. 0	Intercept	-8.802	<.001			
		None (0)					CTQ—physical abuse	0.178	<.001	1.194	1.120	1.273
Sleep problem	JSS—total P < .001	None (0)	67	150	47.8	1 vs. 0	Intercept	-2.355	<.001			
		Only 1 (1)		96	30.6		CTQ—sexual abuse	0.560	<.001	1.750	1.365	2.243
Libido problem	ASEX—total P < .001	Both (2)		68	21.7	2 vs. 0	Intercept	-4.960	<.001			
		None (0)					CTQ—physical abuse	0.219	<.001	1.245	1.125	1.378
Libido problem	ASEX—total P < .001	None (0)					Intercept	0.409	<.001	1.506	1.333	1.700
		Only 1 (1)					JSS—total	0.089	.002	1.093	1.033	1.156
Libido problem	ASEX—total P < .001	Both (2)					Intercept	0.562	<.001	1.754	1.534	2.006
		None (0)					JSS—total	0.149	<.001	1.161	1.089	1.239

ASEX, Arizona Sexual Experience Scale; CTQ, Childhood Trauma Questionnaire; DAS, Dyadic Adjustment Scale; JSS, Jenkins Sleep Scale; OR, odds ratio.

^aModel fitting significance. ^bBold values represent the p < 0.05.

Ethics Committee Approval: This study was approved by Ethics committee of Üsküdar University (Approval No: 61351342, Date: January 31, 2023).

Informed Consent: Verbal and written informed consent was obtained from the patients/patient who agreed to take part in the study.

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