Validity of the premature ejaculation diagnostic tool and its association with International Index of Erectile Function - 15 in patients with evidence-based-defined premature ejaculation.

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Abstract

The premature ejaculation diagnostic tool (PEDT) assesses premature ejaculation (PE). However, there is insufficient evidence about its validity in evidence-based- defined PE. The main aim of this study was to assess the validity of PEDT and its association with an international index of erectile function (IIEF-15) in Acquired premature ejaculation (APE) patients. A total of 50 men complaining of APE from Lahore institute of fertility and endocrinology, Hameed Latif Hospital, and 50 healthy control males without PE from a medical center were enrolled in this study. All individuals were asked to complete questionnaires including demographics, sexual history, and PEDT and IIEF- 15. The results of this research indicated men with APE showed higher PEDT scores (13.51 ± 3.04) and lower IIEF- 15 (39.45 ± 6.54) than men without PE (PEDT: 4.89 ± 2.14, IIEF- 15: 51.36 ± 2.36, $P < 0.001$ for both). Results also reported that a score of ≥ 8 indicated PE in Acquired premature ejaculation (APE) individuals by sensitivity and specificity analyses (sensitivity: 0.985; Specificity: 0.891). In APE men IIEF was negatively correlated to PEDT (adjust $r = -0.311$ $P < 0.001$) after adjusting for age. It was concluded that evidence-based- defined PE was diagnosed by PEDT. Moreover, PEDT was negatively related to IIEF-15 in APE men.

Introduction

Premature ejaculation (PE) is the most prevalent dysfunction, and mostly among adult men, 20–40% suffer from this disease [1–3]. It is reasonably more common and has a negative impact on the life of premature ejaculating patients because of low satisfaction levels during sexual intercourse. In addition, these patients face impaired frequent intercourse and other difficulties during intercourse [4–5]. These problems make men lose their confidence and make them feel diminished self-confidence, depression, anxiety, and distress, and this impaired sexual performance can ultimately damage partner relationships [6].

APE is a condition in which a subject has successful coital relationships in the past but experiences premature ejaculation with the current relationship. In the case of acquired ejaculation, basically a decrease in the latency time of about 3 minutes or less and incapability to delay ejaculate virtually on vaginal penetrations [8]. In APE patients, the latency time is reduced mainly due to sexual distress, erectile dysfunction, and psychological problems. Therefore, three major factors must be kept in mind while dealing with PE patients: time, stress, and control, and it can be considered a tridimensional condition. As PE has a destructive effect on marital relations, it is very challenging to identify whether the couple's troubles are the chief reason or the outcome of PE [9].

There is an association between depression and PE, and depressive signs can harm and destroy the sexual functioning of males and the overall relationship of couples. Failure of proper sexual functioning and poor satisfaction will lead to depressive symptoms and disorders [10]. Increased PE was significantly associated with depression [11]. PE and impotence are commonly present in depressed and anxious male patients, so increasing and decreasing sexual desire must be related to depression. Anxiety and depression play a vital role in maintaining and developing sexual dysfunction [12]. Basically, for the PE

analysis, physical examination, medical history, self-assessment of IELT, PEP, index of premature ejaculation (IPE), and PEDT tools play a significant role in the assessment of PE [13]. The International Index of Erectile Function is a self-report multidimensional psychometric tool used to assess ED. In the case of sexual disorders, the validity and reliability of this tool have been confirmed [21]. Anorgasmia, depression, and anxiety are the comorbidities that are frequently related to PE [22].

Basically, diagnostic tests are not available for ED as it is a self-reported condition and makes it difficult for physicians to confirm that condition or diagnose that state. Clinical instruments are used along with the physical examination and patient history to increase the chances for the correct diagnosis of whether a man is affected by ED. High specificity and sensitivity of IIEF can be used for detecting the real treatment in patients with ED. This diagnostic instrument for ED should be able to differentiate well between men with and without ED, and it should also reflect the severity of ED accurately. Men affected by PE perceived a lower level of orgasmic intensity compared to healthy sexual men [23]. This research will support the clinician in investigating the APE patients and further permit determining the ED prevalence in APE patients. This study will also allow the clinician to be aware of the premature ejaculating persons to take essential precautionary measures to prevent the harms of PE and ED.

The basic focus of this research is to investigate the association between PEDT and IIEF in men with evidence-based premature ejaculation. There is an association between depression and PE, and depressive symptoms can harm and destroy the male sexual functioning and the overall relationship of couples. Therefore, failure of proper sexual functioning and poor satisfaction will lead to depressive symptoms and disorders. This research will be helpful for the clinician to investigate the APE and further allow to determine the Prevalence of ED in APE patients. This will enable the clinician to be aware of the premature ejaculating persons and take necessary precautionary measures to prevent ED.

Materials And Methods

Study design: The current study design was a cross-sectional analytical study. It was carried out at Lahore Institute of Fertility and Endocrinology (LIFE), Hameed Latif Hospital Lahore.

Participants

A total of 100 patients diagnosed as APE and without APE (control) were enrolled in this study. After taking written informed consent, individuals were required to fill out questionnaires based on demographics like age, BMI, marital status, sexual history, past medical history, PEDT, and IIEF. Before the survey study was approved by the Ethical Committee of Hameed Latif Hospital Lahore.

Inclusion criteria:

This study included men with APE having stable sexual relationships with the same female at least for six months, doing intercourse once or more per week, and experiencing morning stiffness without any serotonin inhibitor.

Exclusion criteria

This study excluded men with Major somatic or psychiatric disorder, distress, frustration, taking any drug that affects sexual function, suffering from any mental illness, and alcohol addiction.

PE assessment:

PE was assessed by PEDT, which will be valid in detecting the PE among Punjabi men. Essentially it includes five questions related to sexual stimulation, ejaculation, frustration, sexual satisfaction, and overall score determined by taking all items together. The questions in the PEDT assessment areas:

How problematic is it for you to delay ejaculating? Do you ejaculate before you wish?

Do you ejaculate with significantly less stimulation?

Do you feel upset because of ejaculating before you want?

How anxious are you that your time of ejaculation leaves your partner sexually unsatisfied?

Each question has a zero to fourscore, and the overall PEDT score determines by considering all questions together.

ED assessment

IIEF-15 is essential to determine the ED and several other parameters, including sexual desires, orgasmic function, and overall satisfaction. It comprises fifteen questions, and the overall score will be determined by considering all items together and these domains as follows: Erectile function (question 1-5, 15), Intercourse fulfillment (6-8), Orgasmic function (9, 10), Sexual desires (11, 12), Overall satisfaction (13, 14), and IIEF-15 was scored by taking all questions together.

Relationship between depression and PE

There is an association between depression and PE, and depressive signs can harm and destroy the sexual functioning of males and the overall relationship of couples. Failure of proper sexual functioning and poor satisfaction will lead to depressive symptoms and disorders [10]. Increased PE was significantly associated with depression [11]. PE and impotence are commonly present in depressed and anxious male patients, so increasing and decreasing sexual desire must be related to depression. Anxiety and depression play a vital role in maintaining and developing sexual dysfunction [12].

Association between ED and depression

ED prevalence varies between 31.9 and 70%. It increases with age, and it is the leading risk factor for ED and other risk factors, including hypertension, urinary tract symptoms, smoking, drinking, and psychological factors. So, erectile dysfunction is considerably related to ED.

Statistical Analysis:

The Statistical Package for Social Sciences (SPSS) was used for statistical analysis. A comparison of proportions and quantitative data (as mean ±S. D) was performed by a two-tailed unpaired t-test and chi-square test. Association between PEDT and IIEF-15 was determined by using the Pearson correlation method. Receiver operating characteristics (ROC) analysis was performed to determine the specificity and sensitivity of PEDT. For all results, a p-value less than 0.05 was considered statistically significant.

Results

A total of 100 males, out of which 50 were diagnosed with APE and 50 without APE (control) were taken from Lahore Institute of Fertility and Endocrinology (LIFE) Hamid Latif Hospital and enrolled in this research. This study was conducted to determine the association between PEDT and IIEF-15. So, information was collected, statistical analysis was carried out, and the outcomes were as follows:

Physical parameters

Age of participants

Demographic information, including the age of APE and without APE (control group), was analyzed. The mean ± SD of APE was 39.14 ± 10.36, and the control was 36.45 ± 6.31. No statistical difference was found between the age of both groups.

Table 1: Age distribution of males with APE complaints and control.

	APE	Control	t/x2	P*
Age (Years)	39.14 ± 10.36	36.45 ± 6.31	4.36	0.45

Acquired premature ejaculation was assessed by t-test or Chi-square test t/x2; p*: Kruskal Wallis $p < 0.05$

The age of APE and control groups is almost the same, so the age difference did not affect the results. Furthermore, the age difference between the two groups was not significantly different, with a p-value of 0.45 greater than 0.05, as shown in table 1.

BMI of the participants

BMI (body mass index) of APE and without APE (control group) were analyzed. BMI calculator provides weight status for adults 20 years and older. The mean ± SD of APE was 25.36 ± 2.01, and the control was 24.36 ± 3.14. To remove bias, the BMI of both groups is almost the same.

Table 2: Distribution of BMI of males with acquired premature ejaculation complaints and without Acquired premature ejaculation

	APE	Control x2	t/x2	P*
BMI (kg/m2)	25.36 ± 2.01	24.36 ± 3.14	0.32	0.52

Acquired premature ejaculation was assessed by t-test or Chi-square test t/x2; p*: Kruskal Wallis p < 0.05; APE: acquired premature ejaculation; BMI: Body mass index.

After analyzing the BMI, no statistical difference was found between the BMI of both groups. Therefore, the BMI differences between the two groups were not different, with a p-value of 0.52 greater than 0.05, as shown in table 2.

Sexual Assessment

Validation of PEDT in men with APE

100 males out of 50 diagnosed as APE and 50 without APE were enrolled for verification and evaluation. ROC (Receiver Operating Characteristic) curve is created by plotting the true positive against the false positive rate at different threshold settings.

Two criteria were set in the ROC curve: the minimum value of (sensitivity + specificity) and maximum value of (1-Sensitivity) +(1-Specificity); by following these criteria cutoff was found to be 8, and it also showed the maximum specificity and sensitivity as well. The cutoff value is shown in table 3 and figure 1.

Table 3: Diagnostic cutoff point of premature ejaculation diagnostic tool among men with APE.

	Cut off point	Sensitivity	Specificity	Criteria 1 Sensitivity + specificity	Criteria 2 (1-Sensitivity) +(1-Specificity)
APE	8.00	0.985	0.891	1.80	0.052
	9.00	0.967	0.821	1.87	0.043
	10.00	0.913	0.811	1.84	0.0023

APE: acquired premature ejaculation

PEDT score in APE and without APE (control) men

There were significant differences in PEDT scores between men with APE and without PE. APE cases had significantly higher PEDT scores 13.51± 3.05 than men without PE 4.89 ± 2.14 as high PEDT scores

indicated severe PE. P-value also suggested that the score difference between the two groups was highly significant. PEDT score along with p-value is shown in table 4.

Table 4: **PEDT score according to the presence of acquired premature ejaculation complaints**

	APE	Control	t/x2	P*
PEDT	13.51 ± 3.04	4.89 ± 2.14	22.36	<0.001

PEDT: premature ejaculation diagnostic tool

IIEF score in APE and without APE (control) men:

The mean IIEF-15 score in APE men was 39.45 ± 6.54, significantly lower than the control group, 51.36 ± 2.36, as a low IIEF-15 score showed severe ED and a higher score of IIEF-15 indicated mild ED. P-value also suggested that the score difference between the two groups was highly significant. IIEF score along with p-value is shown in table 5.

Table 5: IIEF scores according to the presence of acquired premature ejaculation complaints

	APE	Control	t/x2	P*
IIEF-15	39.45 ± 6.54	51.36 ± 2.36	11.36	<0.001

IIEF-15: international index of erectile function-15.

The outcome of PEDT and IIEF-15 in men with APE and without PE

There were significant differences in PEDT and IIEF-15 between men with APE and without PE. APE cases had a significantly higher PEDT score of 13.51± 3.05 than men without PE, 4.89 ± 2.14, as a high PEDT score indicated severe PE. Moreover, the mean IIEF-15 score in APE men was 39.45 ± 6.54, significantly lower than the control group, 51.36 ± 2.36, as a low IIEF-15 score showed severe ED and a higher score of IIEF-15 indicated mild ED. (Table 6)

Erectile function (EF)

The erectile function was assessed in APE and control individuals, and it was found that the EF score in the APE group was 17.32 ± 4.36 and in the control group was 25.31 ± 2.31; this score showed that APE individuals had mild ED while the control had no ED. The difference between the two groups was significant, with a p-value of 0.001. Detailed data are shown in table 6.

Intercourse satisfaction (IS)

Intercourse satisfaction of APE and control individuals was assessed by IIEF-15 and found that the APE score was 4.3 ± 1.36 and control score was 7.014 ± 1.36, and the p-value was less than 0.001 showing

significant differences in both groups. Similar results were found in all other domains of IIEF-15, and the p value was less than 0.001, which indicated that the difference was highly significant, as shown in table 6.

Correlation of PEDT and IIEF-15 domains in APE men

Partial correlation was used to determine the association between PEDT and IIEF-15 in APE men. In APE men, a moderate positive correlation was found with erectile function (r = 0.321), and a p-value less than 0.001 showed significant results. PEDT showed weak correlation with intercourse satisfaction (r = -0.18) and orgasmic function (r = -0.056). A weak correlation was found between PEDT and sexual desire, and a p-value less than 0.001 also showed significant results, while PEDT indicated a powerful positive correlation (r= 0.713) with overall satisfaction, and a p-value less than 0.001 is highly significant. IIEF-15 was negatively related to PEDT in men with APE (Table 7).

Table 6: Comparison of PEDT and IIEF- 15 according to the presence of APE complaints

	APE	Control	t/x^2	P*
PEDT	13.51 ± 3.04	4.89 ± 2.14	22.36	<0.001
IIEF-15	39.45 ± 6.54	51.36 ± 2.36	11.36	<0.001
Erectile function	17.32 ± 4.36	25.31 ± 2.31	8.96	<0.001
Intercourse satisfaction	4.3 ± 1.36	7.014 ± 1.36	9.01	<0.001
Orgasmic function	7.23 ± 2.31	8.7 ± 1.02	7.02	<0.001
Sexual desire	6.31 ± 1.52	7.53 ± 1.36	5.01	<0.001
Overall satisfaction	4.12	7.631	4.03	<0.001

Acquired premature ejaculation was assessed by t-test or Chi-square test t/x2; ; p*: Krustal-wallis p < 0.05; APE: acquired premature ejaculation; PEDT: premature ejaculation diagnostic tool; IIEF-15: international index of erectile function-15.

Sexual desire

Sexual desire, a domain of IIEF-15, was assessed in both groups and found that the APE score and control score was 6.31 ± 1.52 and 7.53 ± 1.36, respectively, and lower sexual desire score in APE men indicated poor sexual desire. The p-value was less than 0.001, which showed significant results. (Table 6)

Orgasmic function (OS):

A domain of IIEF and assessed using this tool, and the difference between APE and the control group was found. The mean score of OS in APE men was 7.23 ± 2.31, while in control men was 8.7 ± 1.02, and the difference in score indicated that APE individuals have a poor orgasmic function, as shown in the table

Association between PEDT and IIEF-15 in men with APE

Considering that age might be related to male sexual function and eliminating this factor's influence, partial correlation is used to determine the association between PEDT and IIEF. It was found that PEDT showed a moderate negative correlation with total IIEF-15 (r= -0.311, P < 0.001) and some domains of IIEF, including intercourse satisfaction and orgasmic function in men with PE. The apparent correlation is shown in table 7.

Table 7: Correlations between PEDT and IIEF- 15 in men with APE after adjusting for age

PEDT	IIEF-15		Erectile function		Intercourse satisfaction		Orgasmic function		Sexual desire		Overall satisfaction	
	Adjustr	P*	Adjustr	P*	Adjustr	P*	Adjustr	P*	Adjustr	P*	Adjustr	P*
APE	-0.311	< 0.001	0.321	< 0.001	-0.183	< 0.001	-0.056	< 0.001	0.061	< 0.001	0.713	< 0.001

*Partial correlation was used to assess the correlations between PEDT and IIEF-15 in men with acquired premature ejaculation after adjusting for age. PEDT: premature ejaculation diagnostic tool; IIEF-15: international index of erectile function-15; APE: acquired premature ejaculation

Discussion

This study showed that PEDT was highly valid in screening the presence of evidence-based defined premature ejaculation. PE is reasonably more common and has a negative impact on the life of premature ejaculating patients because of low satisfaction levels during sexual intercourse. Impaired frequent intercourse and other difficulties during intercourse are also faced by these patients [4–5]. These difficulties make men lose their confidence and feel diminished self-confidence, distress, and impaired

sexual performance can ultimately damage partner relationships [6]. Anxiety and depression both play a vital role in maintaining and developing sexual dysfunction [12]. According to a survey by Son et al. (2010), anxiety and depression were highly prevalent in PE patients related to non-PE. Premature ejaculation is also associated with distress and erectile dysfunction. 1,010 men were selected and P-value for ED, anxiety and depression as shown an ED (97.9% vs. 86.5%, $p < 0.001$), Anxiety (82.0% vs. 69.5%, $p < 0.001$), Depression (74.6% vs. 61.3%, $p < 0.001$) rate [24].

Zhang et al. (2013) investigated and showed that various other factors were also related to PE and other comorbidities associated with PE and ED. He found that PE men had higher PEDT and lower IIEF than normal men without PE. Population and culture differences accounted for the different relationship between ED and PE. Various other assessment methods for PE and ED alter the results [25].

This study found that men with PE reported higher PEDT and lower IIEF-15 than those without PE. Moreover, PEDT was negatively related to IIEF-15, which varies according to population and culture.

Although PE and ED may be comorbid conditions in some men, the underlying mechanism of association between PE and ED remains unclear. Previously studies explored the negative psychological distress that ultimately affects premature ejaculation. One of the observational studies conducted by Patrick et al. reported that premature ejaculating persons showed a higher stress level of 64% than non-premature ejaculating persons, whose percentage is almost 4% [30]. Nearly 334 Korean men showed an association between premature ejaculation and depression and reported that PE patients suffer from a psychological disorders, bother, low self-esteem, and low satisfaction level [31].]. In the current study, IIEF was used to determine the ED and its association with PEDT, as PEDT showed a higher score in APE individuals than in control, and IIEF showed lower scores in APE individuals compared to control individuals. A higher PEDT score indicated severe PE, a lower IIEF score specified tough ED, and PEDT and IIEF negatively correlated.

Rosen et al. revealed the importance of IIEF-5, which was used as a diagnostic tool for detecting the severity and presence of ED. For this purpose, 1152 men were enrolled in this study and distributed into two groups, one group of 1036 with Erectile Dysfunction and 116 controls. As IIEF-5 is a preferable tool for the diagnosis of Erectile Dysfunction. ED can be classified according to severity, ranging from none (22 ± 25) to severe (5 ± 7). All these data indicated that IIEF-5 is a vital tool for detecting the prevalence of ED [36].

In current study PEDT showed moderate negative correlation with total IIEF-15 ($r= -0.311$, $P < 0.001$) and some domains of IIEF. Intercourse satisfaction of APE and control individuals was assessed by IIEF-15 and found that the APE score was ± 1.36 and the control score was 7.014 ± 1.36, and the p-value was less than 0.001 showing significant differences in both groups. Similar results were found in all other domains of IIEF-15, and the p-value was less than 0.001, which indicated the difference was highly significant. Furthermore, a negative correlation was found between PEDT and IIEF-15. Furthermore, the negative personal consequences arising from poor sexual performance may give rise to other sexual

problems, including PE and ED [22]. This study found that APE individuals had lower IIEF-15 scores that indicated severe erectile dysfunction and a higher PEDT score that specified severe PE.

Conclusion

The present study concluded that age and BMI do not correlate with PE and ED, but PEDT was highly valid in screening the presence of APE by evidence-based defined premature ejaculation. Men reported with APE had worse PEDT and IIEF-15 scores than men without PE. Moreover, PEDT was negatively related to IIEF-15 in men with APE. As the PEDT score increases, the IIEF-15 score decreases, leading to severe PE and ED in APE individuals. Further studies should be needed to determine the underlying mechanism and relationship between PE and ED.

Declarations

Ethics approval and consent to participate:

The study was approved by the Institutional Ethical Committee (IEC) by Helsinki Declarations. Informed consent was obtained from all subjects before research and publishing the study results.

Consent for Publication:

Not applicable

Availability of data and materials:

The data set used and/or analyzed during the current study is available from the corresponding author on reasonable request.

Competing interests:

The authors declared that they have no competing interests.

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Author's contributions:

HLK editing and reviewing, SA and SB substantial contribution to conception and design of the research, wrote and critically revised the manuscript.

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Figures

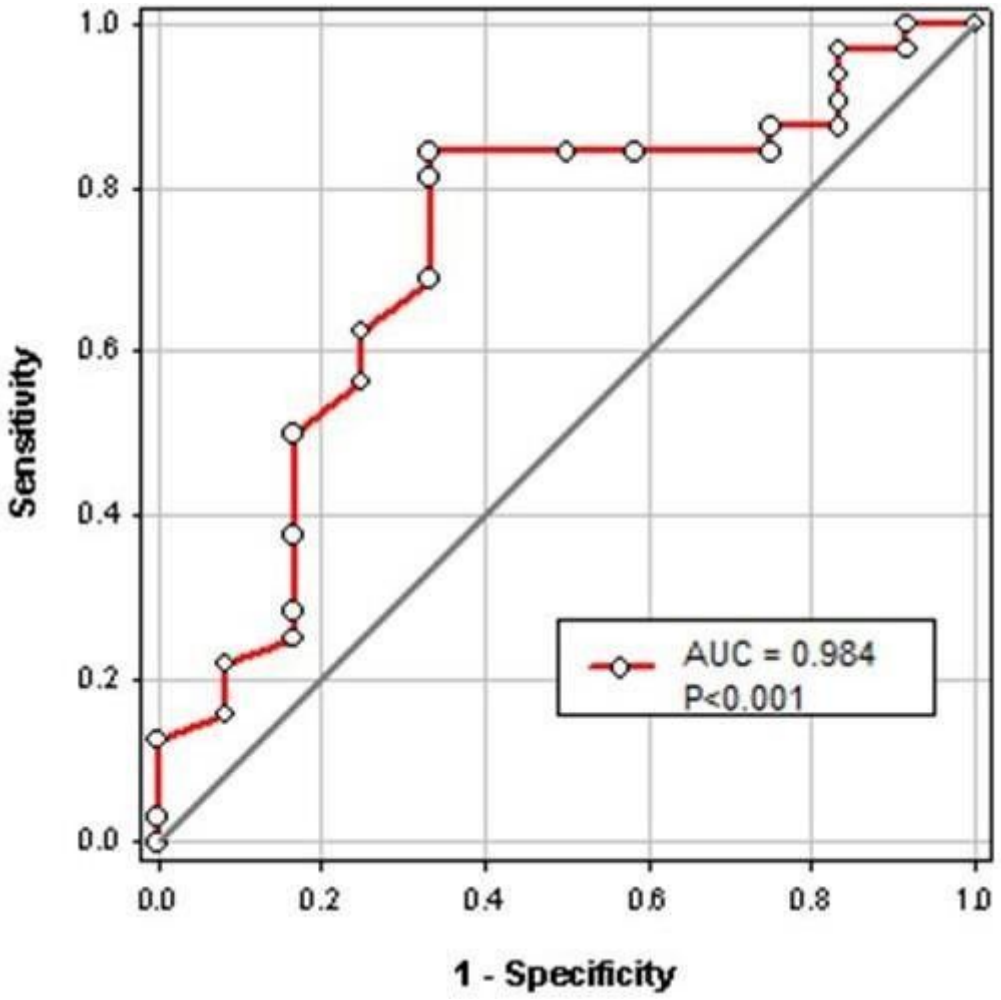

Figure 1

Receiver operative characteristics curve analysis of PEDT scores for the APE classifier.