

Validity of the Premature Ejaculation Diagnostic Tool in four subgroups of premature ejaculation syndrome: data from the Korean Internet Sexuality Survey – part 1

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Abstract. *Background:* The premature ejaculation diagnostic tool (PEDT) is a brief, multidimensional validated instrument devised for diagnosing premature ejaculation (PE). However, there is insufficient evidence regarding its ability to differentiate subgroups of PE. We assessed the ability of the PEDT to differentiate four subgroups of PE (lifelong, acquired, variable and subjective PE). *Methods:* An internet-based survey was conducted with a population-based sample of males aged 20–59 years. Participants were asked to complete a questionnaire requesting detailed medical and sexual histories. The questionnaire including questions from the PEDT and from the Medical Outcome Study Short-form 36-Item Health Survey (SF-36). Using the PEDT, PE was defined as a cutoff score of ≥ 11 . *Results:* In this study, 443 subjects (mean age 39.3 ± 10.1 years) were included. PEDT-PE prevalence was 14.6%. The proportions of PE subgroups and their mean PEDT scores were: lifelong PE, 2.9% and 15.5; acquired PE, 7.0% and 11.2; variable PE, 7.4% and 10.4; subjective PE, 3.2% and 9.0. PEDT scores were significantly higher in the lifelong PE group than in other the subgroups of PE ($P < 0.001$). The subjective PE group had the lowest PEDT score, and their physical and mental component scores for the SF-36 were similar to those of non-PE subjects. *Conclusions:* This population-based cross-sectional survey has demonstrated that the PEDT is not appropriate for research into four subgroups of PE when used in a general male population study, unless the PEDT is combined with an additional questionnaire with specific questions on the four PE subgroups.

Additional keywords: epidemiology, self-report, sexual dysfunction.

Received 22 October 2013, accepted 8 February 2014, published online 26 March 2014

Introduction

Premature ejaculation (PE) is a highly prevalent disorder in many cultures,^{1–3} and there is a substantial amount of evidence that PE has a considerable negative effect on affected individuals in terms of their mental and social wellbeing.^{4–6} In efforts to properly identify and diagnose subjects with PE, previous studies have used various diagnostic criteria such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) IV Text Revision and the International Society for Sexual Medicine (ISSM) definitions.^{7,8} Furthermore, several questionnaires, such as the Premature Ejaculation Profile (PEP),⁹ the Index of Premature Ejaculation (IPE),¹⁰ the Male Sexual Health Questionnaire Ejaculatory Dysfunction (MSHQ-EJD)¹¹ and the Premature Ejaculation Diagnostic Tool (PEDT),¹² have been validated for the assessment of PE. The PEDT, a brief self-report, is a psychometrically validated measure that can be easily administered to facilitate a diagnosis of PE¹² and it has also been validated in Korea.¹³

However, fewer data have been reported on the PEDT than on the Premature Ejaculation Profile or the Index of Premature Ejaculation,¹⁴ probably because the PEDT was released more recently.

Although guidelines have been suggested for the diagnosis of PE,^{14,15} the aetiology of PE is so poorly understood that no definite, unarguable diagnosis of PE based on self-reported questionnaires has been achieved. However, some researchers made efforts to define PE clearly based on neurobiological and psychological views. Waldinger and Schweitzer proposed a new definition of PE for the upcoming DSM V as a syndrome classifiable into four different categories: lifelong, acquired, natural variable or variable, and premature-like ejaculatory dysfunction or subjective PE.^{16,17} Furthermore, this classification system has been reported to have implications for the treatment of PE.^{14,16} Recently, in two series of studies, Serefoglu *et al.* confirmed the four PE subtypes in a Turkish outpatient urology clinic and in the general male population.^{18,19}

However, the specificity of the PEDT for a diagnosis of PE (50.5%) was much lower than that found in the original validation study (93.1%)^{12,18}. Therefore, more studies are warranted to further investigate the validity of the PEDT for the classification of these four subgroups in other countries.^{19,20} Although Zhang *et al.*²¹ and Gao *et al.*²² investigated the prevalence of the four PE subtypes in China, no study has been reported in Korea.

In the Korean Internet Sexuality Survey, a population-based study, we employed and compared PEDT scores in the four subgroups of PE syndrome suggested by Waldinger in order to evaluate its diagnostic ability and usefulness for the classification of PE. Differences between the conventional dichotomous classification (lifelong v. acquired) and the four subgroup classifications of PE (lifelong, acquired, variable and subjective PE) were also investigated with respect to general characteristics, sexual histories and health-related quality of life status in the study population.

Materials and methods

Study design and participants

The Korean Internet Sexuality Survey was designed to evaluate the general prevalence of sexual dysfunctions, relevant help-seeking behaviours and health-related quality of life in the younger generation (aged 20–59 years). This population-based cross-sectional study was conducted in March 2011 by utilising previously demonstrated methodology and an internet survey devised by Son and Song.^{6,23,24} Subjects were recruited from men enrolled with the INR (an internet research company based in Seoul). The research panel represents a national population-based purposive quota sample of men who agreed to participate in internet surveys. We sent invitational emails to 30 000 men in the research panel aged over 20 years with a request that they visited our web portal. Invitees were asked to participate in this survey if they had been involved in sexual activity more than once per month during the previous 6 months and more than once during the previous 4 weeks. Participants were asked to complete a questionnaire requesting detailed medical and sexual histories, and ejaculation-related self-assessments. Subjects taking medications that might have affected ejaculatory function such as antidepressants (selective serotonin reuptake inhibitors, tricyclic antidepressants) or phosphodiesterase type 5 inhibitors were excluded. To exclude unreliable answers, we discarded incomplete answers and those with a response time of less than 20% of the average response time.^{23,25} Part I of the Korean Internet Sexuality Survey was undertaken to evaluate the diagnostic and classification value of PEDT for PE and its four subgroups, and to characterise the PE population. The study protocol was reviewed by the Institutional Review Board at Seoul National University Boramae Hospital.

Self-administered questionnaires

We structured a series of multiple choice questions for the self-administered questionnaire. Self-assessed PE was evaluated using the question: 'Which category would you place yourself in? [translated from Korean],' to which participants responded by selecting one of the following:

premature, normal or delayed ejaculation. If the subject chose PE, further questions were asked to enable the classification of PE into conventional dichotomous groups (lifelong v. acquired) and into the four groups of PE (lifelong, acquired, variable and subjective PE). The validated Korean versions of the PEDT, the MSHQ-EjD, the International Index of Erectile Function (five-item version (IIEF-5), the Medical Outcome Study Short-form 36-Item Health Survey (SF-36) and additional self-assessment questions were also asked. The scores of each of the questionnaires were compared with the PEDT definitions of PE (PEDT-PE) and non-PE groups, and among the four PE subgroups.

Definitions of PE and other factors

The PEDT cutoff score for diagnosing PE was set at ≥ 11 , as was proposed by Symonds, the inventor of the PEDT.¹² Based on Asian criteria,²⁶ body mass index was classified as normal at $<23 \text{ kg m}^{-2}$, overweight at $23\text{--}25 \text{ kg m}^{-2}$ and obese at $>25 \text{ kg m}^{-2}$. IIEF-5 indices were classified as described by Rosen *et al.*: a score of ≥ 22 was classified as normal, 17–21 as mild erectile dysfunction (ED), 12–16 as mildly moderate ED, 8–11 as moderate ED and 5–7 as severe ED.²⁷ The SF-36 is a widely used health status measure.²⁸ It comprises eight health subscales: physical functioning, role – physical, bodily pain, general health, vitality, social functioning, role – emotional and mental health.²⁹ All questions are scored on a scale from 0 to 100, where 100 represents the highest level of functioning possible. The eight subscales are collapsed in order to create two global components: a physical component score and a mental component score (MCS). In the present study, we adopted the Korean version of the SF-36, which was developed and validated by Han *et al.*³⁰

Statistical analysis

All statistical analyses were performed using SPSS ver. 17.0 (SPSS Inc., Chicago, IL, USA). The χ^2 -test was used to compare categorical data, and the independent *t*-test and one-way ANOVA were used to compare numerical data. Binary logistic regression analysis was used to calculate the odds ratios (ORs) of risk factors. All hypotheses were evaluated in a two-sided manner and *P*-values of <0.05 were considered significant. Values are presented as mean \pm s.d.

Results

During the 20-day study period, 1206 individuals opened the invitation email and visited the web portal. After excluding responses from 573 participants due to incomplete answers and 190 for too short a response time or for meeting exclusion criteria, 443 subjects were finally included in the analysis – a response rate of 36.7%. The mean participant age was 39.3 ± 10.1 years and the average frequency of sexual intercourse was 5.6 ± 4.5 times per month. The general characteristics of the study population are summarised in Table 1. The prevalence of self-reported PE was 20.5% and this increased with age and was greatest in men in their 50s. Percentages with ED (mildly moderate to severe ED) also increased with age (4.5%, 11.2%, 13.2% and 32.7% in men in their 20s, 30s, 40s and 50s, respectively). The amount of

Table 1. General characteristics of the study population

BMI, body mass index; PE, premature ejaculation

	Total (%)	Self-reported PE, <i>n</i> = 91 (%)	Non-PE, <i>n</i> = 352 (%)	<i>P</i> -value
Age groups (%)				0.019
20–29 years	112 (25.3)	13 (11.6)	99 (88.4)	
30–39 years	116 (26.2)	22 (19.0)	94 (81.0)	
40–49 years	114 (25.7)	28 (24.6)	86 (75.4)	
50–59 years	101 (22.8)	28 (27.7)	73 (72.3)	
BMI groups (%)				0.258
<23	191 (43.1)	43 (22.5)	148 (77.5)	
23–25	123 (27.8)	19 (15.4)	104 (84.6)	
>25	129 (29.1)	29 (22.5)	100 (28.4)	
Educational level (%)				0.034
Middle school graduate	28 (6.3)	1 (3.6)	27 (96.4)	
High school graduate	46 (10.4)	13 (28.3)	33 (71.7)	
Undergraduate	317 (71.6)	70 (22.1)	2447 (77.9)	
Graduate school	52 (11.7)	7 (13.5)	45 (86.5)	
Marital status (%)				0.021
Single	124 (28.0)	15 (12.1)	109 (87.9)	
Married	316 (71.3)	75 (23.7)	241 (76.3)	
Separate or divorced	3 (0.7)	1 (33.3)	2 (66.7)	
Chronic medical conditions (%)				
Hypertension	47 (10.6)	19 (20.8)	28 (7.9)	0.001
Diabetes	4 (0.9)	1 (1.0)	3 (0.8)	0.603
Gastrointestinal disease	61 (13.7)	17 (18.6)	44 (12.5)	0.079
Liver disease	13 (2.9)	2 (2.1)	11 (3.1)	0.480
Pulmonary disease	12 (2.7)	2 (2.1)	10 (2.8)	0.538
Urologic disease	14 (3.1)	6 (6.5)	8 (2.2)	0.047
Others	59 (13.3)	15 (16.5)	44 (12.5)	0.319
Smoking (%)				0.811
Current smoker	219 (49.4)	38 (22.1)	134 (77.9)	
Previous smoker	52 (11.7)	10 (19.2)	42 (80.8)	
Not a smoker	172 (38.8)	43 (19.6)	176 (80.4)	
Drinking (%)				0.448
Yes	358 (80.8)	71 (19.8)	287 (80.2)	
<1 bottle a week	138 (38.8)	21 (15.2)	117 (84.8)	
2–4 bottles a week	168 (47.2)	38 (22.6)	130 (77.4)	
>5 bottles a week	50 (14.0)	12 (24.0)	38 (76.0)	
Missing	2			
No	85 (19.2)	20 (23.5)	65 (76.5)	
Aerobic exercise (%)				0.001
Daily	30 (6.8)	5 (16.7)	25 (83.3)	
2–3 times in a week	114 (25.7)	14 (12.3)	100 (87.7)	
Once in a week	105 (23.7)	17 (16.2)	88 (83.8)	
Once in a month	110 (24.8)	25 (22.7)	85 (77.3)	
Not at all	84 (19.0)	30 (35.7)	54 (64.3)	

aerobic exercise per month was inversely associated with the rate of PE (Table 1). However, by multivariate analysis, ED (OR=2.59, 95% confidence interval: 1.53–4.39; $P<0.001$) and an unmarried status (OR=2.19, 95% confidence interval: 1.17–4.13; $P=0.014$) were the only predictors of self-reported PE. When we selected patients without ED (IIEF-5 score ≥ 22 , $n=207$), there was no association between age and self-reported PE rate (Fisher's exact test, $P=0.772$).

The rate of PE was found to be variable depending on the type of definition used (Fig. 1). Self-reported PE was found to

have the highest rate (20.5%) in all study subjects, although it was similar to that of PE defined by the self-reported intravaginal ejaculation latency time (IELT) 5-min cutoff (18.7%). Regarding the types of self-reported PE, variable PE had the highest rate (7.4%) and lifelong PE the lowest (2.9%). When we applied the self-reported IELT 1-min cutoff, the rate of PE in the study population was only 1.1%.

Applying the PEDT definition, we found a PE rate of 14.6% among all 443 study subjects. MSHQ-EjD and SF-36 domain scores were also significantly different in the PEDT-PE and

non-PE groups (Table 2). The PEDT-PE group had a slightly higher mean age than the non-PE group (41.6 years *v.* 38.9 years, respectively; $P=0.047$) and their self-reported IELT was shorter than that of the non-PE group (4.3 *v.* 13.6 min, respectively; $P<0.001$). A lower percentage of PEDT-PE was noted in men who consumed alcohol than in those who did not drink (6.9 *v.* 17.8%; $P=0.006$), although no dose–response relationship was found between alcohol consumption and PE. When we analysed PE rates after eliminating the acquired PE group from the analysis, almost no difference was found between alcohol consumers and nonconsumers (14.5% and 14.6%; $P=1.00$).

Contrary to a lack of difference in MSHQ-EjD scores, significant differences in PEDT scores were found across the PE subgroups. PEDT scores were significantly higher in the lifelong PE group and lower in the subjective PE group than in the other subgroups of PE (Table 3, Fig. 2). In the variable and

subjective PE groups, although the PEDT mean was higher than that in the total population, mean scores were lower than 11, the cutoff score used for the PEDT-PE definition.

We examined the diagnostic power of PEDT for the detection of self-reported lifelong PE using receiver operating characteristic curve analysis. Sensitivity and specificity were 91.3% and 93.8%, respectively, using a PEDT cutoff score of 11, and were 91.3% and 80.5%, respectively, using a PEDT cutoff score of 9 (Fig. 3). Using the PEDT-PE definition, we found a significant difference between the two subgroups in the conventional dichotomous (lifelong or acquired) classification and among Waldinger's four subgroups of PE by cross-table analysis (Fisher's exact test, $P<0.001$ and 0.002, respectively). However, a PEDT cutoff score of 9 was not found to be useful for classifying PE dichotomously (lifelong or acquired) or for classification into Waldinger's four subgroups by cross-table analysis (Fisher's exact test, $P=0.53$ and 0.55, respectively).

All SF-36 domain scores were significantly different between the PEDT-PE and non-PE groups (Tables 2, 3). However, no differences in domain scores were found across the PE subgroups except for the physical function domain (Table 3).

Personal attitude towards sexual activity and relationship between the subject and his partner were evaluated using two self-assessment questions. Of the four subgroups of Waldinger's PE, subjects in the subjective PE group talked to their partners about their problems about sex more often than those in the lifelong PE group ($P=0.048$, ANOVA with Tukey's *post hoc* analysis). Furthermore, the subjective PE group showed a more positive attitude towards sexual activity than the other subgroups ($P=0.035$, ANOVA with Tukey's *post hoc* analysis).

By multiple logistic regression analysis, ED, not consuming alcohol and a low physical component score remained significant predictors of PEDT-PE (Table 4).

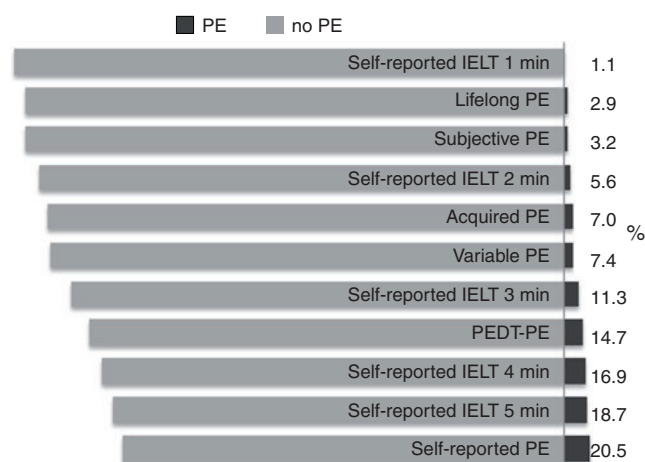


Fig. 1. Prevalence of premature ejaculation (PE) according to various diagnostic methods. IELT, intravaginal ejaculation latency time; PEDT, the Premature Ejaculation Diagnostic Tool. Lifelong PE, acquired PE, variable PE and subjective PE are the subgroups of PE suggested by Waldinger *et al.*¹⁶

Table 2. Premature Ejaculation Diagnostic Tool (PEDT), Male Sexual Health Questionnaire Ejaculatory Function Domain (MSHQ-EjD) and Medical Outcome Study Short-form 36-Item Health Survey (SF-36) domain scores according to the PEDT-defined status of PE

Values in the table indicate the mean \pm s.d. MCS, mental component score; PCS, physical component score

	PEDT-defined PE	Non-PE	P-value
PEDT	13.45 \pm 2.48	5.49 \pm 2.92	<0.001
MSHQ-EjD	30.00 \pm 4.63	33.33 \pm 4.49	<0.001
SF-36			
Physical function	82.53 \pm 19.72	89.08 \pm 16.03	0.013
Role – physical	37.68 \pm 43.55	64.81 \pm 42.99	<0.001
Role – emotional	39.48 \pm 63.31	63.31 \pm 44.77	<0.001
Vitality	47.53 \pm 55.67	55.67 \pm 12.41	0.001
Mental health	53.35 \pm 17.15	59.20 \pm 12.50	0.010
Social function	65.57 \pm 22.42	78.27 \pm 18.86	<0.001
Bodily pain	71.07 \pm 24.99	83.16 \pm 18.70	<0.001
General health	44.07 \pm 19.80	59.81 \pm 15.29	<0.001
PCS	58.84 \pm 21.90	74.22 \pm 18.69	<0.001
MCS	51.48 \pm 21.59	64.11 \pm 17.98	<0.001

Discussion

This is the first cross-sectional study to compare PEDT scores with Waldinger's four subgroups of PE (lifelong, acquired, variable and subjective PE) to assess the ability of PEDT scores to differentiate subgroups of PE. Lifelong PE is a chronic ejaculatory dysfunction characterised by symptom clusters as follows: ejaculation occurs too early at nearly every intercourse, with nearly every woman, from about the first sexual encounters onwards, within 30–60s in the majority of cases or 1–2 min, and remains rapid during life.^{7,31} Acquired PE is characterised by the following symptoms: early ejaculation occurs at some point in a man's life, the man has usually had normal ejaculation experiences before the start of complaints and there is a sudden or gradual onset.³¹ Men with variable PE only experience early ejaculation coincidentally and situationally. Variable PE should not be regarded as a symptom or manifestation of true pathology but of normal variation in sexual performance.³¹ In subjective PE, men experience or complain of PE although the ejaculation time is in the normal range (i.e. ~3–6 min) and may even be of very long duration (i.e. 5–25 min). Subjective PE should not be regarded as a symptom or manifestation of true medical pathology. Psychological or relationship problems may underlie the complaints.³¹

Table 3. Premature Ejaculation Diagnostic Tool (PEDT), Male Sexual Health Questionnaire ejaculatory function domain (MSHQ-EjD), International Index of Erectile Function (five-item version) (IIEF-5) and Medical Outcome Study Short-form 36-Item Health Survey (SF-36) domain scores in each premature ejaculation (PE) group
Max, maximum; MCS, mental component score; Min, minimum; PCS, physical component score

	Total, <i>n</i> = 443	Non-PE, <i>n</i> = 352	Lifelong PE, <i>n</i> = 13	Acquired PE, <i>n</i> = 31	Variable PE, <i>n</i> = 33	Subjective PE, <i>n</i> = 14	<i>P</i> -value
PEDT score							<0.001
Mean \pm s.d.	6.65 \pm 4.017	5.47 \pm 3.12	15.54 \pm 3.40	11.26 \pm 3.65	10.45 \pm 3.11	9.07 \pm 2.92	
Range (Min–Max)	20 (0–20)	14 (0–14)	12 (8–20)	14 (6–20)	13 (4–17)	10 (4–14)	
Median	6	6	16	12	11	8	
MSHQ-EjD score							0.133
Mean \pm s.d.	32.84 \pm 34.00	33.18 \pm 4.69	32.23 \pm 3.74	31.19 \pm 4.40	16.88 \pm 4.57	33.64 \pm 3.5	
Range (Min–Max)	37 (3–40)	37 (3–40)	12 (26–38)	15 (23–38)	16 (9–25)	10 (27–37)	
Median	34	35	32	32	17	34	
IIEF-5 score							0.014
Mean \pm s.d.	20.42 \pm 3.62	21.05 \pm 3.09	16.38 \pm 3.88	18.61 \pm 4.23	16.88 \pm 4.57	20.86 \pm 3.73	
Range (Min–Max)	19 (6–25)	13 (12–25)	12 (11–23)	19 (6–25)	16 (9–25)	9 (16–25)	
Median	21	22	16	20	17	22	
SF-36 (Mean \pm s.d.)							
Physical function	88.12 \pm 16.76	89.34 \pm 16.72	69.61 \pm 21.16	87.90 \pm 11.23	87.42 \pm 11.66	76.78 \pm 20.99	0.001
Role-physical	60.83 \pm 44.09	65.48 \pm 42.72	42.30 \pm 48.28	35.48 \pm 43.19	46.96 \pm 43.19	50.00 \pm 51.88	0.696
Role-emotional	59.81 \pm 45.74	63.82 \pm 44.63	38.46 \pm 50.63	36.55 \pm 45.01	52.52 \pm 46.42	47.61 \pm 50.15	0.552
Vitality	54.48 \pm 13.68	56.22 \pm 12.24	52.30 \pm 20.47	51.61 \pm 15.88	44.69 \pm 14.35	42.14 \pm 18.05	0.147
Mental health	58.34 \pm 13.42	59.35 \pm 12.67	56.00 \pm 21.03	55.22 \pm 15.67	54.18 \pm 14.03	52.00 \pm 13.85	0.907
Social function	76.41 \pm 19.91	78.08 \pm 18.81	62.50 \pm 28.86	68.14 \pm 20.87	74.24 \pm 19.99	70.53 \pm 26.22	0.430
Bodily pain	81.39 \pm 20.18	83.01 \pm 19.03	74.61 \pm 29.94	77.01 \pm 24.11	77.57 \pm 16.74	65.71 \pm 27.16	0.414
General health	57.50 \pm 16.94	60.79 \pm 15.05	36.92 \pm 28.90	44.19 \pm 17.51	47.12 \pm 12.12	47.85 \pm 17.17	0.323
PCS	71.96 \pm 19.93	74.65 \pm 18.81	55.86 \pm 27.18	61.14 \pm 19.13	64.77 \pm 16.77	60.08 \pm 26.75	0.613
MCS	62.26 \pm 19.06	64.37 \pm 17.98	52.31 \pm 22.85	52.31 \pm 22.85	56.41 \pm 20.04	53.07 \pm 25.25	0.892

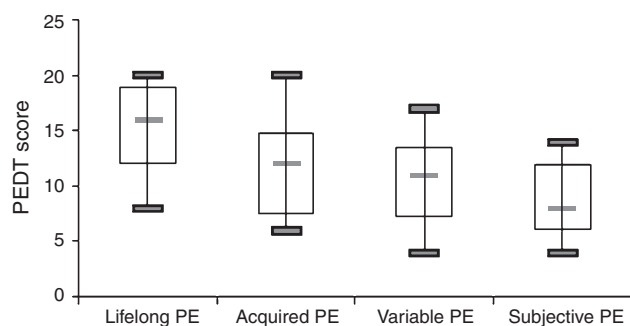


Fig. 2. Box plot of premature ejaculation diagnostic tool (PEDT) scores in the four subgroups of premature ejaculation (PE). Lifelong PE, acquired PE, variable PE and subjective PE are the subgroups of PE suggested by Waldinger *et al.*¹⁶

We sought to determine the characteristics of PEDT-PE in Korea. Several earlier studies have reported the prevalence and characteristics of PE patients in Korea, but these studies did not apply a detailed classification of PE.^{3,6,13,23} In the present study, we found that mean PEDT scores were significantly higher in lifelong PE and lower in the subjective PE group than the cutoff value for PE definition. Such differences across PE subgroups support the recently suggested four-subtype classification of

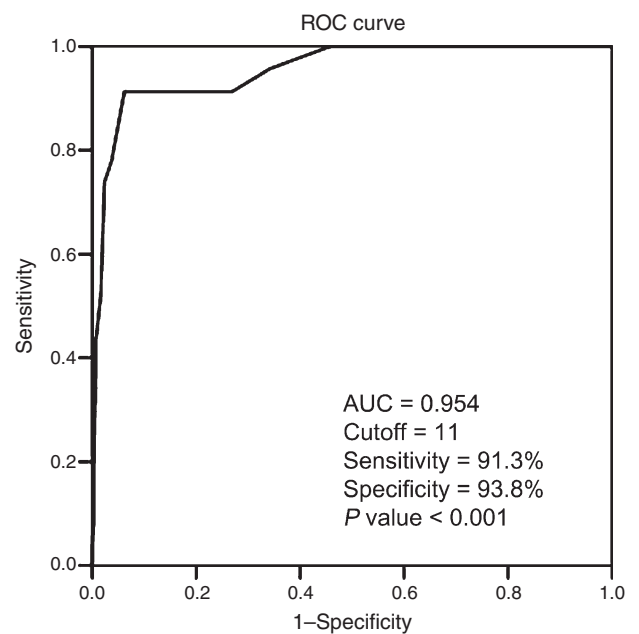


Fig. 3. Receiver operating characteristic curve analysis calculated for premature ejaculation diagnostic tool (PEDT) scores. The area under the curve (AUC) (\pm s.d.) is 95.4 \pm 2.1%.

Table 4. Risk factors for Premature Ejaculation Diagnostic Tool-defined premature ejaculation in logistic regression analysis

CI, confidence interval; OR, odds ratio; PCS, physical component score

	OR	95% CI for OR		<i>P</i> -value
		Lower	Upper	
Erectile dysfunction	2.306	1.116	4.765	0.024
Alcohol nonconsumer	1.992	1.040	3.817	0.038
PCS	0.801	0.732	0.878	<0.001

Waldinger³² and the treatment strategy of the ISSM.¹⁴ Use of the PEDT may enable clinicians to easily differentiate PE patients who need pharmacotherapy rather than behavioural therapy or psychotherapy (i.e. between those with lifelong or acquired PE, and those with variable PE or subjective PE).

In variable PE, men only occasionally suffer from early ejaculation.^{32–34} Variable PE should be regarded as part of the normal variability of ejaculatory performance and not a symptom of pathology.

The PEDT was developed to capture the essence of the DSM-IV-TR by incorporating five questions that measure control, frequency, minimal stimulation, distress and interpersonal difficulties relevant to ejaculation. In other words, it does not directly reflect IELT. However, the recent definition of PE suggested by the ISSM adopted an IELT cutoff of 1 min.⁷ Furthermore, it was recommended that 'self-estimation by the patient and partner of ejaculatory latency be accepted as the method for determining IELT in clinical practice'.¹⁴ The IELT cutoff of 1 min is expected to be included in the upcoming version of the DSM (DSM-V), as was proposed by Waldinger.¹⁶ Therefore, the PEDT alone might be inadequate for diagnosing the time-related characteristics of PE.

We administered the PEDT to diagnose PE in our study population using a cutoff score of 11. This cutoff score was suggested by the inventor of the PEDT and was also validated in Korean PE cohorts^{12,13}. The authors of both studies recommended that a PEDT score of 9 and 10 be classified as 'probable PE,' based on sensitivity and specificity analysis. The value of this diagnostic grey zone was also non-negligible in the present study, because we found identical sensitivity and slightly lower, but still considerable, specificity for cutoff scores of 9, 10 and 11 for defining PE by ROC curve analysis (Fig. 1). Nevertheless, this 'probable PE' definition was not valuable for classifying PE. Therefore, we consider that a PEDT cutoff score of ≥ 11 provides clinicians more information than a cutoff score of ≥ 9 does for classifying PE.

In epidemiological studies, PE has been found to be the most common sexual complaint in males and to affect ~20–30% of males in all age groups.^{1,2,35} Such a high prevalence of PE presumably represents the high percentage of men with 'complaints' of PE.³¹ Similarly a high prevalence of self-reported PE was also observed in the Korean population in two surveys^{23,36} and in the present study. However, the prevalence of PE depended on the definition of PE used, as shown in Fig. 1. These results concur with those of previous reports, namely that the use of IELT alone to define PE do not fully capture the subjective aspects of the disorder.^{9,23} The prevalence rates of PE have already been predicted to be

different whether a general male population is investigated or whether a clinical population is investigated, as suggested by Waldinger and confirmed by Serofoglu and the Chinese investigators.^{16,19,21,22} Nevertheless, it is noteworthy that the rate of PE using a 1-min cutoff of self-reported IELT was the lowest and close to that of self-reported lifelong PE. Thus we speculate that self-reported IELT could be useful for determining lifelong PE, although not all subjects that complain of PE are likely to be included.

The SF-36 has been proven to be useful for comparing general and specific populations, for estimating the relative burdens of different diseases, for differentiating the health benefits produced by a wide range of different treatments and for screening individual patients.³⁷ Using this validated questionnaire, we found that all domains, mental and physical, were significantly different in the PE and non-PE groups, regardless of whether we applied the self-reported definition or the PEDT definition. This result concurs with previous studies on the psychological burden of PE.^{4–6} Notably, self-assessed physical function scores were lower in PE groups, and these men had significantly lower levels of physical activity, especially aerobic exercise. Although we could not find a causal relationship between the amount of physical activity and physical function scores, we did find a suggestion of a correlation between low levels of physical activity and self-awareness of poor physical health status in terms of PE. Thus, further objective studies on physical function could confirm any relationships between physical function and physical activity in both PE and non-PE subjects.

One interesting aspect of sexual attitudes was noted during our analysis: no differences were observed between the four PE groups in terms of overall health-related quality of life as assessed by the physical component score and the mental component score in SF-36. However, subjects in the subjective PE group were found to talk to their partners about sexually related problems more often than those in the lifelong PE group. Furthermore, this group of subjects showed more positive attitudes towards sexual activity than others. In other words, they seemed to adopt franker and more assertive standpoints regarding sexual matters. In addition to this social and psychological activeness, their physical status was also comparatively higher in that they were better able to control ejaculation. Overall, subjects in the subjective PE group considered themselves PE sufferers despite their physical and mental adequacies.

This study has several limitations. First, there are concerns of selection bias in terms of choosing the study population. For example, because this study was based on an internet survey, our cohort may have been biased towards users with higher educational and socioeconomic profiles. In addition, the low response rate (36.7%) also raises the issue of predisposition to selection bias, although this level of response rate was not unexpected and was similar to those of other internet survey-based studies.^{6,23} Furthermore, the prevalence of PE (PEDT-PE) found in the present study is similar to previously reported values.^{1,2,35} Second, we divided subjects into subgroups according to Waldinger's classification system, which is based exclusively on self-assessment. Thus, in order to classify subjects more reliably, a further study incorporating a

face-to-face interview is warranted. Finally, the number of respondents in each of the subgroups might be insufficient to be representative of each PE syndrome. However, we believe that our result scan strengthen the knowledge about PE as it provides some population-based data on PE.

Conclusions

This population-based cross-sectional survey investigated the validity of the PEDT as a diagnostic tool for the differentiation of subgroups of PE. The current study has demonstrated that the PEDT is not appropriate to capture all men with subjective PE when used in an epidemiological general male population study. The PEDT alone is therefore not suitable for research of Waldinger's four PE subtypes, unless the PEDT is combined with an additional questionnaire with specific questions on the four PE subtypes, as has been performed in the current study.

Conflicts of interest

None declared.

Acknowledgements

All statistical analyses were carried out under consultation with medical statisticians at the Medical Research Collaborating Center at Seoul National University College of Medicine.

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