The Assessment of Reliability and Validity of Utrecht Gender Dysphoria Scale-Thai Version as a Screening Tool for Gender Dysphoria in Thai Transgender Women

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Background: Gender dysphoria is a psychological distress caused by the incongruence between gender assigned at birth and gender characteristic. This condition is an indication for cross-sex hormone or sex-reassignment surgery. To date, there is no available tool to assess gender dysphoria in Thai language.

Objective: To translate male-to-female Utrecht gender dysphoria scale (UGDS-MTF) into Thai language to create a credible UGDS-MTF-Thai version.

Materials and Methods: The present study was a cross-sectional study in a community base setting. The process of the translation included forward translation, backward translation, and revision with a permission of the original author. The validity and reliability of the questionnaire was analyzed.

Results: Fifty natal males were included in the study, which included 25 transwomen [TGW] and 25 men who had sex with men [MSM]. The average sum score of UGDS-MTF-Thai in TGW was significantly higher than those of MSM at 47.5 and 25.9, respectively. The overall index of item-objective congruence (IOC) was 0.87 and the overall Cronbach's alpha was 0.97. The sensitivity and specificity of the test was 92% and 96%, when the cut point was set at 40.

Conclusion: UGDS-MTF-Thai is a reliable tool to assess gender dysphoria in Thai natal males with gender variations. The scale provides good sensitivity and specificity in detecting gender dysphoria. According to the simplicity of the UGDS-MTF-Thai-scale, it is applicable for both epidemiologic study and in clinical use.

Keywords: Gender dysphoria, Transgender, Transwomen, Utrecht gender dysphoria score, Gender dysphoria measurement

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Transgender woman (TGW) or transwomen is a general term referring to a natal male who has female gender identity. To medically identify this condition, the American Psychiatric Association (APA) has introduced diagnostic criteria in Diagnostic and Statistical Manual of Mental Disorders (DSM). In DSM-IV and DSM IV-TR, the term gender identity disorder (GID) was used. In 2013, the APA has launched a current version of DSM-V and replaced GID with gender dysphoria (GD)[1]. The GD is a term referring to psychological distresses originating from the incongruence between natal gender and one's sense of gender identity, either experienced or expressed gender[1,2]. GD potentially leads to anxiety, depression, and obsessive-compulsive disorder that may induce behavioral, emotional, mental, or physical health problems[1,3-5]. This GD diagnostic criteria focuses mainly on the psychological distress from the discrepancy of assigned gender and gender identity rather than to identify a person's identity[2]. DSM-V criteria for GD includes six items as follows[1]:

• A marked incongruence between one's experienced or expressed gender and primary or secondary gender characteristics.

• A strong desire to be rid of one's primary or secondary gender characteristics because of a marked incongruence with one's experienced or expressed

gender.

• A strong desire for the primary or secondary gender characteristics of the other gender

• A strong desire to be of the other gender.

• A strong desire to be treated as the other gender.

• A strong conviction that one has the typical feelings and reactions of the other gender.

To make a diagnosis, at least two items persisting for more than six months are required. The conditions must cause psychological distress or difficulties in social life or diminishing important daily functions to fulfil the criteria[1,2].

Many assessment tools have been established to measure and evaluate GD. One of the most commonly used questionnaire in Europe is the Utrecht gender dysphoria scale (UGDS), developed in 1997 by Cohen-Kettenis & van Goozen[6]. This questionnaire is composed of 12 items that focus on body appearance, gender role, and identity[6,7]. This tool is short, simple, and practical with excellent discriminate validity and reliability when used with the diagnosis of GID according to DSM-IV-TR[6-8]. For a male to female version, the Cronbach's α value was 0.80, while the sensitivity and specificity of the test was 88.3% and 99.5%, respectively, at the cut-point of 40 in European population[8].

The prevalence of transwomen is estimated to be 6.8 transwomen per 100,000 worldwide[9]. However, the actual prevalence is difficult to estimate according to cultural issues, recruitment method variations, and controversial definitions used for identifying cases[10]. In Thailand the prevalence of transwomen was 1.24% or equal to 311,819 transwomen countrywide in 2019. This number was calculated from a military conscription process, which is mandatory for all adult males older than 18 years old[11,12]. Although, the prevalence of transwomen in Thailand is much greater than the average number worldwide, there is no reliable tool available in Thai language to diagnose and evaluate GD in this particular group. The present study aimed to translate male-to-female Utrecht gender dysphoria scale (UGDS-MTF) into Thai language and to test the reliability of the translated version to create a reliable standard tool for diagnosing, evaluating, and measuring GD in Thai transwomen population.

Materials and Methods
Patients

The present study was a cross sectional study of 50 natal males, twenty-five were TGW and twenty-five were men who have sex with men (MSM).

All participants were recruited from a military conscription in April 2019 in Chiang Mai province. TGW and MSM individuals that attended the military conscription were invited to visit the Mplus Foundation Clinic for health check-up and sexual transmitted infection screening. During the visit, demographic data and UGDS were obtained as a part of a standard care. Data from medical records were used for the analyses in the present study.

In Thailand, natal males with obvious female expression may be omitted from military recruitment. A medical certificate with a diagnosis of "Gender Dysphoria" according to DSM-V is required in such a circumstance. The valid medical certificate must be issued by a certified psychiatrist from medical centers approved by the Thai military. Participants with the medical certificate of GD who had female gender identity regardless of medical or surgical transition status and sexual orientation would be allocated to the TGW group. In the MSM group, participants who had male gender identity but were attracted to males or both males and females were included. The present study was evaluated by the Ethical Committee of Faculty of Medicine, Chiang Mai University (number 7344/2020).

The sample size was calculated based on a formula for Cronbach's alpha estimation proposed by Bonett[13] with expected Cronbach's alpha coefficient of 12 items at 0.80 according to a previous study in transwomen[8], with a probability of type I error (α) at 0.05, 10% precision rate and a level of significance of 0.05. According to the calculation, the required sample size was 40 participants. Fifty participants were included to cover a 20% dropout rate.

Utrecht gender dysphoria scale-Thai version

The UGDS-MTF-Thai contained 12 statements. Answers were a five-rating scale indicating the level of agreement. For the male to female version, scoring system was similar in all statements, which were agree completely=5, agree somewhat=4, neutral=3, disagree somewhat=2, and disagree completely=1. Higher final scores indicated higher intensity of GD[6,8]. The UGDS was translated from English into Thai language with permission from the original author of this scale.

Translation process consisted of forward translation, backward translation, and the test for reliability. The primary forward translation process was performed by two independent translators who were medical personnel in the field of transgender care to ensure the correct meaning of all medical terms. The two sets of questionnaires from the

ผลกระทบของเพศสภาพต่อชีวิต (UGDS-MTF-Thai)

<u>คำอธิบาย</u> กรุณาทำเครื่องหมาย ✔ ในช่องที่ตรงกับความเป็นจริงของท่านมากที่สุด

	เห็นด้วยอย่างยิ่ง	ค่อนข้างเห็นด้วย	กลางๆ	ค่อนข้างไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
(1) ชีวิตฉันจะไร้ความหมาย ถ้าฉันต้องใช้ชีวิตแบบผู้ชาย					
(2) ฉันรู้สึกเจ็บปวดทุกครั้ง เวลามีคนปฏิบัติกับฉันเหมือนฉันเป็นผู้ชาย					
(3) ฉันรู้สึกแย่ทุกครั้ง เวลามีคนเรียกฉันด้วย นาย หรือคุณผู้ชาย					
(4) ฉันรู้สึกไม่มีความสุขเพราะฉันมีรูปร่างแบบผู้ชาย					
(5) ความคิดที่ว่าฉันจะต้องเป็นผู้ชายตลอดไปทำให้ฉันรู้สึกอับจนหนทาง					
(6) ฉันเกลียดตัวเองที่เป็นผู้ชาย					
(7) ฉันรู้สึกไม่ดีเลยที่ต้องแสดงออกแบบผู้ชาย ไม่ว่าจะเป็นที่ไหนหรือเมื่อไหร่					
(8) การได้เป็นผู้หญิง จะทำให้ชีวิตฉันมีค่ามีความหมาย					
(9) ฉันไม่ชอบการยืนปัสสาวะ					
(10) ฉันไม่ชอบที่หนวดขึ้น เพราะมันทำให้ฉันดูเป็นผู้ชาย					
(11) ฉันไม่ชอบเวลาที่อวัยวะเพศแข็งตัว					
(12) ถ้าต้องใช้ชีวิตแบบผู้ชาย ฉันเลือกไม่อยู่เลยดีกว่า					

<u>สำหรับเจ้าหน้าที่</u>

UGDS Score = _____

Figure 1. Utrecht gender dysphoria scale (UGDS) for male to female transgender in Thai language.

two translators were then compared and discussed item by item to create a draft of UGDS-MTF-Thai version. The document was then re-evaluated by two independent transwomen doctors to identify inappropriate or offensive words yet retained the precise meaning to create a final UGDS-MTF-Thai version. The content of the final questionnaire was validated by five specialists who were familiar in transgender care, which were four gynecologists and one psychiatrist. A backward translation from the final UGDS-MTF-Thai version to English was performed by a linguistician who was not in a field of medicine and had never been exposed to the original version of UGDS. The backward-translated-version was then compared to the original English version to confirm the accuracy of the translation. This version was also reviewed by the original developer to ensure the preciseness of all statements (UGDS-MTF-Thai was provided in Figure 1).

Statistical analysis

Characteristics of participants were described using frequencies and percentages for categorical variables. Medians and interquartile ranges (IQRs) were used for continuous variables. Demographics between MSM and TGW were compared using Wilcoxon rank-sum test for continuous variables and Fisher's exact test for categorical variables. The index of item-objective congruence (IOC) was used to evaluate the content validity. Reliabilities of UGDS-MTF-Thai questionnaire items were examined using Cronbach's alpha coefficient.

The UGDS total scores were compared by characteristics of participants for all participants, TGW and MSM using Wilcoxon rank-sum test for dichotomous variables, and Kruskal-Wallis test for polychotomous variables. All statistical analysis were performed using R Statistical Software (version 3.6.1; R Foundation for Statistical Computing, Vienna,

Table 1. Demographic data (n=50)

Characteristics	Total, 50 (100); n (%)	TGW, 25 (50.0); n (%)	MSM, 25 (50.0); n (%)	p-value
Age (year); median (IQR)	23 (20 to 29)	23 (20 to 28)	24 (21 to 29)	0.593[a]
Career				0.087[b]
Full-time employment	21 (42)	14 (56)	7 (28)	
Part-time employment	5 (10)	3 (12)	2 (8)	
Training	6 (12)	1 (4)	5 (20)	
Other	18 (36)	7 (28)	11 (44)	
Financial status				0.058[b]
Very good	5 (10)	3 (12)	2 (8)	
Good	9 (18)	8 (32)	1 (4)	
Fair	30 (60)	12 (48)	18 (72)	
Poor	6 (12)	2 (8)	4 (16)	
Marital Status				0.407[b]
Stable relationship	13 (26)	5 (20)	8 (32)	
Unstable relationship	6 (12)	2 (8)	4 (16)	
Single	31 (62)	18 (72)	13 (52)	
Family's attitude toward participants' gender or sexual orientation				0.024[b]
Accepted/supportive	17 (34)	13 (52)	4 (16)	
Unaccepted/not supportive	2 (4)	1 (4)	1 (4)	
Unaware	28 (56)	10 (40)	18 (72)	
Other	3 (6)	1 (4)	2 (8)	
Gender identity*				<0.001[b]
Female	20 (40)	19 (76)	1 (4)	
More female	10 (20)	6 (24)	4 (16)	
More male	5 (10)	0 (0)	5 (20)	
Male	10 (20)	0 (0)	10 (40)	
Other	5 (10)	0 (0)	5 (20)	
Gender expression**				<0.001[b]
Always dress as a female	19 (38)	19 (76)	0 (0)	
More female	7 (14)	6 (24)	1 (4)	
More male	4 (8)	0 (0)	4 (16)	
Always dress as a male	17 (34)	0 (0)	17 (68)	
Other	3 (6)	0 (0)	3 (12)	
Wish to have female secondary sex characteristics				<0.001[b]
Yes	25 (50)	24 (96)	1 (4)	
No	21 (42)	0 (0)	21 (84)	
Uncertain	4 (8)	1 (4)	3 (12)	
Hormonal use				<0.001[b]
Current or past use	17 (34)	17 (68)	0 (0)	
Plan to use in the future	8 (16)	7 (28)	1 (4)	
Never want to use	24 (48)	1 (4)	23 (92)	
Other	1 (2)	0 (0)	1 (4)	

TGW=transgender woman; MSM=men who had sex with men; IQR=interquartile range

[a] Wilcoxon rank-sum test, [b] Fisher's exact test

* Gender identity is defined as a person's intrinsic sense of being male (a boy or a man), female (a girl or woman), or an alternative gender[14]

** Gender expression is defined as a characteristic in personality, appearance, and behavior that in a given culture and historical period are designated as masculine or feminine[14]

Austria).

Results
Demographic data

Of the 50 participants, which included 25 MSMs and 25 TGW, the median age was 23 (IQR 20 to 29) years. Most participants (76%) reported their families knew their gender identities, but only a third said their gender identities or sexual orientation was accepted and supported by their family. Transgender group gained a higher family support ratio than MSM group at 52% versus 16% (p=0.024). Most participants were single (62%), working full-time (42%), with fair to good economic status (60%) (Table 1). Regarding the transwomen group, almost all (96%) had a strong desire to transform their body to a female body. Sixty-eight percent of the group were currently or previously on hormonal treatment and another 28% had a plan to start hormonal treatment in the future. Gender reassignment surgery had been done in 24% of TGW group where another 52% plan to do so in the future.

Validity and reliability analysis

The overall IOC was 0.87 and the score of each item was at least 0.6, which represented the good validity of the content. The overall Cronbach's alpha was 0.97, which represented high reliability of the UGDS-MTF-Thai. Correlations of all items ranged from 0.79 to 0.92, which indicated good stability and internal consistency. The Cronbach's alpha showed that deleting any item could not raise the reliability (Table 2).

Comparison of UGDS scores

Regarding the score, results of UGDS scores in TGW was significantly higher than those of MSM [median (IQR), 48 (44 to 51) versus 27 (15 to 36), p<0.001]. There was no difference in UGDS score between groups of characteristics among all participants. However, the authors found that the UGDS scores were different between MSM with single, unstable relationship, and stable relationship status [27 (15 to 35), 14 (13 to 15), and 36 (32 to 36), respectively, p=0.042) (Table 3). If the cut point was set at score 40 according to a previous study[8], sensitivity of the test would be 92% and specificity would be 96%.

Discussion

The main objective of the present study was to test the validity and reliability of the UGDS-MTF-Thai version to create a credible tool to evaluate GD

Table 2. Utrecht gender dysphoria scale content validation and reliability test (n=50)

Item	IOC	Cronbach's alpha		
		Mean (SD)	Corrected item-total correlation	Cronbach's alpha if item deleted
Item 1	1.0	3.2 (1.4)	0.79	0.97
Item 2	1.0	3.4 (1.3)	0.90	0.97
Item 3	1.0	3.3 (1.4)	0.91	0.97
Item 4	1.0	3.2 (1.2)	0.92	0.97
Item 5	0.8	3.0 (1.2)	0.87	0.97
Item 6	1.0	2.8 (1.3)	0.87	0.97
Item 7	0.8	3.1 (1.4)	0.86	0.97
Item 8	0.8	3.2 (1.4)	0.90	0.97
Item 9	1.0	2.9 (1.3)	0.87	0.97
Item 10	0.8	3.1 (1.4)	0.83	0.97
Item 11	0.6	2.9 (1.4)	0.87	0.97
Item 12	0.6	2.6 (1.3)	0.84	0.97
Overall	0.87	36.7 (14.1)	NA	0.97

IOC=item-objective congruence; SD=standard deviation; NA=not available

in Thailand. The findings of the present study have affirmed that UGDS-MTF-Thai version is a reliable tool with good sensitivity and specificity to detect and evaluate GD in Thai transwomen population.

Using DSM-V as a diagnostic criterion is one of the strong points of the present study. The DSM-V is a diagnostic criterion launched in 2013 by the American Psychiatric Society and has been widely used. In the past, the diagnosis was focused on one's gender identity rather than the distress caused by the incongruence[2]. These different concepts in diagnosis might affect the efficacy of the tool to use as a diagnostic aid. In 2013, the validity and reliability of the UGDS were examined compared to DSM-IV-TR "gender identity disorder" by Steensma et al. Their result confirmed the validity and reliability of UGDS with Item-total correlation of 0.81 to 0.94 and Cronbach's alpha of 0.98[8]. The present study is the first study to test the UGDS compared with a current DSM-V "gender dysphoria". The authors' results yielded similar level of reliability with the previous study[8]. This confirms the integrity of UGDS in current situations where DSM-V is endorsed. Furthermore, high sensitivity and specificity of 92% and 96% were identified in the present study, which agreed with a previous study when the cut point was set at 40[8]. This finding implies the potential of UGDS as a screening tool to detect GD in both European and Asian populations where the social climates are different. Another strength of the present study was

Table 3. Comparison of UGDS total score (n=50)

Characteristics	Overall; median (IQR)	p-value	TGW; median (IQR)	p-value	MSM; median (IQR)	p-value
UGDS total score[a]	38 (28 to 48)	-	48 (44 to 51)	-	27 (15 to 36)	<0.001
Age group		0.844[b]		0.701[b]		0.616[b]
<23 years (n=21)	37 (32 to 48)		48 (44 to 51)		33 (16 to 36)	
≥23 years (n=29)	39 (24 to 49)		50 (44 to 51)		24 (13 to 36)	
Career		0.141[c]		0.479[c]		0.485[c]
Full-time employment (n=21)	45 (35 to 50)		50 (45 to 52)		18 (12 to 32)	
Part-time employment (n=5)	37 (31 to 50)		50 (40 to 55)		34 (33 to 36)	
Trainee (n=6)	36 (23 to 38)		42 (NA)		36 (19 to 36)	
Other (n=18)	37 (29 to 47)		47 (44 to 48)		29 (20 to 35)	
Financial status		0.375[c]		0.574[c]		0.609[c]
Very good (n=5)	41 (24 to 50)		50 (46 to 51)		22 (20 to 23)	
Good (n=9)	45 (42 to 47)		46 (44 to 48)		31 (NA)	
Fair (n=30)	36 (28 to 48)		50 (48 to 51)		33 (16 to 36)	
Poor (n=6)	28 (12 to 44)		51 (47 to 56)		13 (12 to 21)	
Family's attitude toward participants' gender or sexual orientation		0.159[c]		0.707[c]		0.636[c]
Accepted/Supported (n=17)	46 (36 to 51)		48 (42 to 52)		26 (18 to 53)	
Unaccepted/Not supported (n=2)	34 (26 to 42)		50 (NA)		18 (NA)	
Unaware (n=28)	36 (20 to 45)		48 (45 to 50)		28 (13 to 36)	
Other (n=3)	42 (35 to 44)		42 (NA)		36 (32 to 41)	
Marital status		0.053[c]		0.223[c]		0.042[c]
Single (n=31)	42 (32 to 49)		48 (45 to 52)		27 (15 to 35)	
Unstable relationship (n=6)	17 (14 to 27)		38 (34 to 41)		14 (13 to 16)	
Stable relationship (n=13)	37 (36 to 49)		50 (49 to 51)		36 (32 to 36)	

UGDS=Utrecht gender dysphoria scale; TGW=transgender women; MSM=men who have sex with men

[a] Median UGDS scores were different between TGW and MSM (p<0.001), independent t-test, [b] Wilcoxon rank-sum test, [c] Kruskal-Wallis test

the recruitment process that enrolled participants from a military conscription. The event was mandatory for all Thai natal males, over 18 years old, and they must be present at the venue. This method of recruitment would positively represent the genuine population. This method also depicted the efficacy of the tool in field work with a general population.

The UGDS-MTF-Thai questionnaire is simple and user-friendly, yet accurate to assess GD in natal males. It contains 12 short statements that are easy to comprehend. Therefore, this tool is useful in both field research and clinical use. This questionnaire may help identify GD patients that need a referral in primary health care setting. As the sum score of the tool provides information about intensity of GD, it can be used as a reliable modality to measure the severity of dysphoria in clinical use. Regarding the fact that there is no valid GD assessment tool in Thai language, this questionnaire may serve as a reliable tool to improve the quality of transgender care in Thailand.

Since the present study used a medical certificate as evidence of GD, the variability of each doctor in diagnostic process was a point of concern. This inconsistency might potentially cause misinterpretation of the results. However, the medical certificate accepted in the present study must be issued by certified psychiatrists from specific medical centers designated by the Thai military. Moreover, DSM-V was the only standard guideline used in making a diagnosis. This helped minimize the ambiguity of the diagnosis process in the present study. Another limitation was that the control group in the present study was natal males who have variations in sexual orientation. Therefore, the present study did not provide information about the UGDS score in cis-males or in gender non-binary people. The next limitation was the level of representativeness as recruiting participants from military conscription contributes to a highly confined sample. The present study's participants mostly lived in Chiang Mai and were of young age. Furthermore, the number of participants was limited. Thus, the results cannot

represent the whole country or continent since the social climate in gender issues might vary considerably. The other noteworthy point was that GD was a condition that must be diagnosed by a trained physician. Therefore, this scale was to be used as a measurement tool rather than a diagnostic tool.

Future research

Although the original version of UDGS had been intensively tested for reliability and validity[6,8] and the present study showed a good content validity and reliability of the UGDS-MTF-Thai version, further validation such as a construct discriminate validity, criterion predictive validity, and criterion concurrent validity should be further investigated to ensure the validity of the UGDS-MTF-Thai version. As the study group did not include other gender variation people than transwomen, further validation study in a wider group of gender dysphoric people is of value. Apart from this version of UGDS, UGDS-MTF is yet to be translated and validated to deliver better care for gender variation people in the future.

Conclusion

The UGDS-MTF-Thai is a credible tool to assess gender dysphoria in Thai natal males with gender variation. The scale provides good sensitivity and specificity in detecting gender dysphoria. According to the simplicity of the UGDS-MTF-Thai scale, it is suitable for both epidemiologic study and in clinical use.

What is already known on this topic?

Gender dysphoria is a psychological distress caused by the incongruence between natal gender and gender characteristics. This can be diagnosed using the standard criteria of the American Psychiatric Association (APA). UGDS is a reliable tool for gender dysphoria assessment that has been widely used in western countries. To date there is no available tool to evaluate gender dysphoria in Thai language.

What this study adds?

The authors believe that the findings represent the validity and reliability in of UGDS-MTF-Thai as a tool to assess gender dysphoria in Thai transgender people. This study could also be a good reference for other researchers to use this scale in future research regarding gender study. This tool can potentially be the first standard scale in Thai language for health care providers to objectively assess gender dysphoria in Thai transgender people in a clinical setting.

References

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington: American Psychiatric Association; 2013. p. 451-9.
2. Zucker KJ. The DSM-5 diagnostic criteria for gender dysphoria. In: Trombetta C, Liguori G, Bertolotto M, editors. Management of gender dysphoria: A multidisciplinary approach. Milano: Springer; 2015. p. 33-7.
3. Connolly MD, Zervos MJ, Barone CJ 2nd, Johnson CC, Joseph CL. The mental health of transgender youth: advances in understanding. J Adolesc Health 2016;59:489-95.
4. Chodzen G, Hidalgo MA, Chen D, Garofalo R. Minority stress factors associated with depression and anxiety among transgender and gender-nonconforming youth. J Adolesc Health 2019;64:467-71.
5. Valentine SE, Shipherd JC. A systematic review of social stress and mental health among transgender and gender non-conforming people in the United States. Clin Psychol Rev 2018;66:24-38.
6. Cohen-Kettenis PT, van Goozen SH. Sex reassignment of adolescent transsexuals: a follow-up study. J Am Acad Child Adolesc Psychiatry 1997;36:263-71.
7. Schneider C, Cerwenka S, Nieder TO, Briken P, Cohen-Kettenis PT, De Cuypere G, et al. Measuring gender dysphoria: A multicenter examination and comparison of the utrecht gender dysphoria scale and the gender identity/gender dysphoria questionnaire for adolescents and adults. Arch Sex Behav 2016;45:551-8.
8. Steensma TD, Kreukels BPC, Jürgensen M, Thyen U, de Vries ALC, Cohen-Kettenis PT. Chapter 3. The utrecht gender dysphoria scale: A validation study. In: Steensma TD, editor. From gender variance to gender dysphoria. Alblasserdam, Netherlands: Ridderprint

BV; 2013. p. 41-56.

9. Arcelus J, Bouman WP, Van Den Noortgate W, Claes L, Witcomb G, Fernandez-Aranda F. Systematic review and meta-analysis of prevalence studies in transsexualism. Eur Psychiatry 2015;30:807-15.

10. Collin L, Reisner SL, Tangpricha V, Goodman M. Prevalence of transgender depends on the "Case" definition: a systematic review. J Sex Med 2016;13:613-26.

11. Seekaew P, Pengnonyang S, Jantarapakde J, Sungsing T, Rodbumrung P, Trachunthong D, et al. Characteristics and HIV epidemiologic profiles of men who have sex with men and transgender women in key population-led test and treat cohorts in Thailand. PLoS One 2018;13:e0203294.

12. Bureau of Epidemiology and Thailand MOPH and US CDC Collaboration. Estimates of the size of key population at risk for HIV infection. Nonthaburi: Bureau of Epidemiology; 2016.

13. Bonett DG. Sample size requirements for testing and estimating coefficient alpha. J Educ Behav Stat 2002;27:335-40.

14. Coleman E, Bockting W, Botzer M, Cohen-Kettenis P, Cuypere G, Feldman J, et al. Standards of care for the health of transsexual, transgender, and gender-nonconforming people, Version 7. Int J Transgend 2012;13:165-232.