Original article

Reliability and validity of the Thai version of the genital appearance satisfaction questionnaire

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Abstract

Background: The genital appearance satisfaction (GAS) questionnaire was constructed to measure women's feelings toward their own genitals in a broader spectrum. The Thai language GAS questionnaire is valuable for clinical and research purposes.

Objectives: This study aimed to assess the reliability and validity of the Thai version of the GAS questionnaire.

Methods: For this study, 90 Thai women attending the gynecologic outpatient clinic at King Chulalongkorn Memorial Hospital between July 2017 and June 2018 were recruited. Ten participants dropped out because they did not answer the second questionnaire. The original English version of the GAS questionnaire was translated into the Thai version and backward translated by another linguist. The questionnaire content was then validated by two urogynecologists. After informed consent was obtained, the participants were asked to complete the Thai version of the GAS questionnaire and the Thai version of the female sexual function index (FSFI) at their first visit and only the Thai version of the GAS questionnaire at a 2-week interval (sent back by mail).

Results: The average age of the participants was 33.9 ± 7.0 years. The mean Thai version of the GAS questionnaire total scores at week 0 and week 2 were 6.0 ± 3.0 and 6.4 ± 2.8, respectively. The total score's internal consistency (Cronbach's alpha) was 0.9, and the intraclass correlation coefficient of the total score was 0.9 (0.8, 0.9).

Conclusion: We found that the Thai version of the GAS questionnaire is reliable and valid. It can be used to evaluate the satisfaction of genitalia in Thai women.

Keywords: Genital appearance satisfaction, questionnaire, Thai.

Over the past few years, female genital cosmetic surgery has dramatically increased in popularity.[1] Many procedures have been proposed for the improvement of genital appearance or performance, including labioplasty, clitoral hood reduction, perineoplasty, vaginoplasty, hymenoplasty, and G-spot augmentation. These procedures may be performed alone or in combination.[2] Labiaplasty is the most common procedure,[3] the main labiaplasty objectives are to remove tissue from the labia minora that hangs below the labia majora,[4] which may also be used to achieve symmetry between both sides of the labia minora.[5] The common reasons given for labioplasty requests are esthetic dissatisfaction, discomfort in clothing, discomfort when taking part in sports, and dyspareunia by the invagination of protuberant tissue.[2]

The Genital Appearance Satisfaction (GAS) scale is a questionnaire designed to describe the satisfaction of genital appearance in both men and women.[6] This questionnaire can measure the differences in women's reported satisfaction with all aspects of their genital appearance. There are few validated instruments for genital appearance available in the Thai version, such as the Thai version of the Female Genital Self-Image Scale.[7] The GAS questionnaire items include questions that evaluate sexual problems due to genital appearance and problems with exercise and wearing underwear, which are not included in the other questionnaires. The GAS questionnaire is an option

for evaluating genital appearance satisfaction among Thai women for research purposes or clinical use.

The purpose of this study was to validate the GAS questionnaire in the Thai language for use among Thai-speaking women. The second purpose was to study the correlation between GAS and the Female Sexual Function Index (FSFI) scores.

Materials and methods

This study was reviewed and approved by the institutional review board (IRB no. 141/60), and conducted at the general gynecology outpatient clinic, Faculty of Medicine, King Chulalongkorn Memorial Hospital, from July 2017 to June 2018.

GAS scale

There are 11 questions about an individual's attitude toward their genital appearance to be rated by the participant in the GAS questionnaire. The scores of each item range between 0 and 3 (from "Never" to "Always", respectively), and the total score ranges from 0 to 33. A higher score represents greater dissatisfaction with their genital appearance.[6]

FSFI

The FSFI is a brief self-report questionnaire,[8] which is a multidimensional tool for assessing the key dimensions of sexual function in women. The questionnaire consists of 19 items that assess sexual function over the past 4 weeks and provides scores in six areas: sexual desire, arousal, lubrication, orgasm, satisfaction, and pain. The Thai language version of FSFI has already been evaluated for validity and reliability after translation.[9]

Translation process

After permission was obtained from the original study's authors, the English version of the GAS questionnaire was forward translated into Thai by a linguist from the Language Institute, Chulalongkorn University, and backward translated by another linguist. The final draft was accomplished after a small group of 10 women was interviewed, and the content was validated by two urogynecologists in our department. All translated questions were assessed for agreement of relevance to the original English version by two urogynecologists (content validity index = 1). The Thai version of the GASS questionnaire was then administered to 90 female participants on a volunteer basis (90 participants with 10 participant dropouts, who did not return the second questionnaire at two weeks). Inclusion criteria were patients in a general gynecology outpatient clinic, aged 18–65 years, sexually active, with the ability to read and write in Thai. The exclusion criteria were women who were pregnant and who could not read and write Thai. The patients were asked to complete the Thai version of the GAS questionnaire and the Thai version of the FSFI at the first visit. At the 2-week interval, only the Thai version of the GAS questionnaire was completed and sent back via mail.

Statistical analysis

For descriptive statistics, the mean, standard deviation (SD), median, interquartile range (IQR), and 95% confidence interval (CI) were used. The reliability and validity of the Thai version of the GAS questionnaire were determined using weighted kappa, test–retest reliability, and Cronbach's alpha with statistical significance at $P < 0.05$. The statistical software IBM SPSS Statistics for Windows (version 22.0) was used for statistical analysis. The correlations of the GAS total score with the FSFI score were evaluated using Pearson's test for correlation. A correlation coefficient of <0.3 was classified as "weak," 0.3–0.5 as "moderate," and >0.5 as "large."[10]

Sample size estimation was calculated from the formula for sample size requirements for estimating the intraclass correlations with desired precision, as developed by Bonett DG, et al.[11]

"$n = 8z_{(alpha/2)}^2 \times [(1 - pI)^2(1 + (k - 1)pI)^2]/k(k - 1)w^2 + 1$,"

where alpha = 0.05, pI (intraclass correlation from a pilot study in 10 volunteers) = 0.7, k (rater) = 2, and w (desired precision) = 0.2. Thus, the number of participants needed to complete the questionnaire was:

$8(2.0^2) \times [(0.3)^2(1 + (2 - 1)\,0.7)^2]/2(2 - 1)0.2^2 + 1 = 82.5 \sim 82.0$ participants.

Eight cases (10.0% of 82 cases) were added to account for any dropouts. Therefore, the total number of participants required in this study was 90.

Results

Ninety participants were enrolled in this study, of which ten participants only completed the questionnaire on the first visit. The demographic characteristics of the participants are presented in **Table 1**. The mean age

Table 1. Patient's characteristics (n = 80).

	Mean ± SD	n (%)
Age (years)	33.9 ± 7.0	-
BMI (kg/m²)	21.4 ± 3.3	-
Profession		
Housewife	-	14 (17.5)
Government officer	-	1 (1.3)
Private business	-	10 (12.5)
Company employee	-	54 (67.4)
Others	-	1 (1.3)
Education		
Primary school	-	2 (2.5)
Secondary school	-	9 (11.2)
Vocational certificate	-	30 (37.5)
Bachelor's Degree	-	37 (46.3)
Master's or Doctoral Degree	-	2 (2.5)
Number of children		
0	-	41 (51.2)
1	-	17 (21.3)
2	-	18 (22.5)
3	-	4 (5.0)
Route of delivery		
Vaginal route	-	29 (36.3)
Cesarean section	-	10 (12.5)

BMI, body mass index.

of the participants was 33.9 ± 7.0 years, the mean body mass index (BMI) was 21.4 ± 3.3 kg/m², and most women were company employees **(Table 1)**.

The item response of the Thai version of the GAS questionnaire score is shown in **Table 2**, and the mean of the total score at week 0 and week 2 was 6.0 ± 3.0 and 6.4 ± 2.8, respectively **(Table 2)**. The weighted kappa of each item ranged from 0.8 (Q4) to 1.0 (Q2 and Q10) **(Table 2)**. The internal consistency (Cronbach's alpha) of the total score was 0.94, and the intraclass correlation coefficient (95% CI) of the total score was 0.9 (0.8, 0.9) **(Table 2)**. The total scores of the Thai GAS questionnaire and Thai FSFI questionnaire were moderately correlated with a Pearson's correlation coefficient of 0.5 **(Table 3)**. The correlation of the total GAS score to each domain score of FSFI ranged from 0.3 to 0.5 **(Table 3)**.

Discussion

In this study, we found that the Thai version of the GAS exhibited good reliability as well as good internal consistency (Cronbach's alpha coefficient = 0.9) when compared to the original questionnaire (0.73).[6] This

can be explained by the simplicity of the questionnaire after translation into the Thai language. These findings were similar to other reports on female cosmetic surgery in the United Kingdom.[12] They reported testing the GAS questionnaire in English women undergoing female cosmetic surgery (labiaplasty) and found a similar high internal consistency when compared to the original study.[12] There is also a report of an Arabic translation of the GAS questionnaire for Arabic women who underwent female cosmetic surgery.[13] Even though there was no report on the reliability and validity of the Arabic version, they found that the GAS questionnaire was able to detect the satisfaction of Arabic women and determine a difference before and after surgeries.[13] We also found a moderate correlation between the Thai version of the GAS questionnaire's total score with the Thai version of the FSFI total score and each domain score.

The availability of a good instrument for evaluating the female genital appearance image is important for clinical use to follow up and reflect on the patient's response after treatment. Furthermore, there is a report on improving genital self-image by using the GAS questionnaire after female cosmetic surgery.[14]

Table 2. Item response, weighted Kappa, intraclass correlation (ICCr) and Cronbach's alpha of Thai version GAS questionnaire score (n = 80).

Item	Visit		Weighted Kappa (95%CI) of each item	Cronbach's alpha of each item
	Weeks 0 n (%)	Weeks 2 n (%)		
I feel that my genitals are normal in appearance			0.9 (0.9, 1.0)	0.99
Never	48 (60.0)	46 (57.5)		
Sometimes	7 (8.8)	7 (8.8)		
Often	16 (20.0)	18 (22.5)		
Always	9 (11.2)	9 (11.2)		
I feel that my genitals are unattractive in appearance			1.0 (1.0, 1.0)	0.99
Never	33 (41.2)	34 (42.4)		
Sometimes	36 (45.0)	35 (43.8)		
Often	8 (10.0)	8 (10.0)		
Always	3 (3.8)	3 (3.8)		
I feel that my labia are too large			0.8 (0.7, 1.0)	0.59
Never	75 (93.8)	43 (53.7)		
Sometimes	3 (3.8)	29 (36.3)		
Often	2 (2.4)	3 (3.7)		
Always	0 (0)	5 (6.3)		
I am satisfied with the appearance of my genitals			0.8 (0.9, 0.9)	0.89
Never	32 (40.0)	28 (35.0)		
Sometimes	5 (6.3)	5 (6.2)		
Often	28 (35.0)	31 (38.8)		
Always	15 (18.7)	16 (20.0)		
I experience irritation to my labia when exercising/walking			0.9 (0.8, 1.0)	0.74
Never	74 (92.5)	72 (90.0)		
Sometimes	5 (6.2)	5 (6.2)		
Often	1 (1.3)	3 (3.8)		
Always	0 (0)	0 (0)		
I feel, or have felt, conscious in sexual situations because of the appearance of my genitals			0.8 (0.5, 1.0)	0.92
Never	78 (97.4)	78 (97.4)		
Sometimes	1 (1.3)	2 (2.6)		
Often	1 (1.3)	0 (0)		
Always	0 (0)	0 (0)		
Embarrassment about the appearance of my genitals spoils my enjoyment of sex			0.9 (0.8, 1.0)	0.99
Never	76 (95.0)	76 (95.0)		
Sometimes	1 (1.3)	1 (1.3)		
Often	3 (3.7)	3 (3.7)		
Always	0 (0)	0 (0)		
I feel discomfort around my genitals when I wear tight clothes			0.9 (0.7, 1.0)	0.83
Never	0 (0)	0 (0)		
Sometimes	5 (6.3)	4 (5.0)		
Often	54 (67.5)	55 (68.8)		
Always	21 (26.2)	21 (26.2)		

Table 2. (Cont.) Item response, weighted Kappa, intraclass correlation (ICCr) and Cronbach's alpha of Thai version GAS questionnaire score (n = 80).

Item	Visit		Weighted Kappa (95%CI) of each item	Cronbach's alpha of each item
	Weeks 0 n (%)	Weeks 2 n (%)		
I feel that my genital area is visible under tight clothes			0.9 (0.7, 1.0)	0.96
Never		72 (90.0)	72 (90.0)	
Sometimes	6 (7.5)	6 (7.5)		
Often	2 (2.5)	2 (2.5)		
Always	0 (0)	0 (0)		
I worry about the appearance of my vaginal area			1.0 (1.0, 1.0)	1.0
Never	78 (97.5)	78 (97.5)		
Sometimes	2 (2.5)	2 (2.5)		
Often	0 (0)	0 (0)		
Always	0 (0)	0 (0)		
I feel that my genital area looks asymmetric, or 'lopsided'			0.9 (0.7, 1.0)	0.57
Never	52 (65.0)	77 (96.2)		
Sometimes	24 (30.0)	2 (2.5)		
Often	2 (2.5)	1 (1.3)		
Always	2 (2.5)	0 (0)		
			ICCr (95% CI) of total score	Cronbach's alpha of total score
Total score	**6.0 ± 3.0**	**6.4 ± 2.8**	**0.9 (0.8, 0.9)**	**0.9**

Table 3. Correlation of Thai version GAS score with FSFI score (n = 80).

Measurement	Pearson's correlation coefficient	*P* - value
GAS score *vs.* FSFI total score	- 0.5	< 0.001
GAS score *vs.* FSFI (desire domain)	- 0.4	0.004
GAS score *vs.* FSFI (arousal domain)	- 0.4	0.003
GAS score *vs.* FSFI (lubrication domain)	- 0.4	< 0.05
GAS score *vs.* FSFI (orgasm domain)	- 0.5	< 0.001
GAS score *vs.* FSFI (satisfaction domain)	- 0.3	0.019
GAS score *vs.* FSFI (pain domain)	- 0.5	< 0.001

FSFI, female sexual function index; GAS, genital appearance satisfaction.

A good questionnaire to evaluate satisfaction with the genital appearance will be valuable for both clinical use and research purposes for medical and surgical treatment concerning the genital appearance. The GAS questionnaire comprises 11 simple questions with a simple response scale. In this study, we confirm the good reliability and validity of the Thai version of the GAS questionnaire. This questionnaire is a useful tool for evaluating the satisfaction of genital appearance in Thai women.

This study was conducted with a strictly validated process for the development of a standard protocol. The questionnaire translation was performed by experienced linguists. The content validation was performed by two urogynecologists to confirm that the translation version represented the theoretical construct similar to the original version. The responsiveness study is not included in this study. Therefore, further studies before and after the treatment for genital appearance, such as medical treatment or genital cosmetic surgery, are suggested.

Conclusion

The Thai version of the GAS questionnaire was found to be reliable and valid. This questionnaire could be used for evaluating the satisfaction of external genitalia in Thai women.

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Conflict of interest statement
All authors have completed and submitted the International Committee of Medical Journal Editors Uniform Disclosure Form for Potential Conflicts of Interest. All authors declare that they have no conflicts of interest.

Data sharing statement
All data generated or analyzed in the present study are included in the published article. Further details are available for noncommercial purposes from the corresponding author upon reasonable request.

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