Original article

Self-objectification, eating disorders, and mental health of senior high school female students in Bangkok

Gunchanon Khawda[a], Siriluck Suppapitiporn[b,*]

[a]*Program in Mental Health, Department of Psychiatry, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand*
[b]*Department of Psychiatry, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand*

Background: High school female students have higher self-objectification more than others. Many studies showed that self-objectification was positively correlated with eating disorders and negative mental health outcomes.

Objectives: To study relationships among self-objectification, eating disorders, and mental health of senior high school female students in Bangkok and to study predictors of eating disorders.

Methods: The cross-sectional descriptive study was conducted in high school female students who was studying in Mathayom 6th from 6 schools in Bangkok. The data were collected by questionnaires including demographic data questionnaire, self-objectification questionnaire, the Eating Attitudes Test-26 in Thai version (EAT-26), and Thai Mental Health Indicator-15 (TMHI-15).

Results: The total subjects were 395; their mean age was 17.7 ± 0.5 years. Eating disorders (EAT $\geq$ 12) were found 23.8%. Self-objectification was positively correlated with eating disorders ($r = 0.34$, $P < 0.01$). Body surveillance ($r = 0.31$, $P < 0.01$), body shame ($r = 0.33$, $P < 0.01$), and control belief were positively correlated with eating disorders ($r = 0.12$, $P < 0.05$). In addition, self-objectification was negatively correlated with mental health. Moreover, body shame ($\beta = 0.22$) and body surveillance ($\beta = 0.18$) could significantly predict eating disorders.

Conclusion: Self-objectification and three domains (body surveillance, body shame, and control belief) were related with eating disorders and poor mental health. It was concerned that self-objectification could lead to negative psychological outcomes.

Keywords: Body shame, eating disorders, EAT-26, mental health, self-objectification.

Adolescence is one the most rapid changes in human development, such as, physical, intellectual, psychological, emotional and social development.[1] In Erikson's stages of psychosocial development, adolescence is in the "Identity" stage.[2] Adolescents believe in the ideal philosophy and pay attention at the social value. If this stage is failed, they will become confused about their identity and role. Body image of adolescents is retrieved from thought, belief, cultural and social value. They try to manage their body image to be like social value and standard norm, for example,

female adolescents desire to be thinner for more attractive appearance.[3] If they cannot manage their appearance like desired standard norm, they may have low self-esteem and try to evaluate their appearance frequently, and have disordered eating behavior. These can affect negatively to physical and psychological outcomes.[3]

Objectification theory was represented by Fredrickson BL, *et al.*[4, 5] that was retrieved from Feminism. This theory is focused on women who assess themselves from cultural and social value, judge themselves at external values, overlook internal needs and self-feeling, compare themselves as a sexual objectification that brings female values in beauty and sexually attractive appearance. Women always look at their appearance through outsider views that affect them to do harder to get perfect ideal body image, as called self-objectification.[4, 5] McKinley NM,

et al.[5] divided self-objectification into three domains including body-surveillance, body shame, and control belief. Body-surveillance is defined that person try to evaluate their appearance through outsider views and assess their appearance from perfect ideal norm. Body shame is defined that person assesses oneself as not perfect as ideal norm. After that person feels shame at oneself body image. Control belief is defined that person believes oneself ability to manage appearance to be perfect as ideal norm.[6] Self-objectification is related with negative psychological outcomes, such as anxiety and body dissatisfaction. The research found that female adolescents had body surveillance[7] and body shame more than male adolescents.[8] Harrison K, et al.[9] reported that middle and high schools female students in the United States of America, grade 6th – 12th, had self-objectification higher than students in other grades.[9] Akanni OO, et al.[10] found that female students in Nigeria had body surveillance higher than male students significantly. In addition, Tiggemann M, et al.[11] showed that self-objectification would be decreased when age was older.

Eating disorders is a state of illness that affects physical and psychological outcomes.[12] Patients who suffer from eating disorders have false belief and negative feeling about their body appearance and weight extremely. They try to control their weight strictly, such as, strict dieting, extreme exercise for losing weight, and vomiting to bring out the food.[13] This abnormality is found in every period of life, especially in adolescence and early adulthood.[14] The Eating Attitudes Test-26 (EAT-26) was developed by Kaewporndawan T, et al.[12] to assess eating disorders in ordinary people. EAT-26 is used in various study samples, consists of 3 domains including dieting, bulimia with food preoccupation, and oral control.[12] In Thailand studies, Kaewporndawan T, et al.[12] found that female adolescents, 12 - 19 year-of-age, had 9.0% of abnormal attitudes and eating behaviors. Puengyod A, et al.[15] found that Thai female high school students in Bangkok had 10.7% of abnormal attitudes and eating behaviors (EAT-26 $\geq$ 20).[15] Chittiwan S, et al.[16] found that Thai female high school students in Pathumthani Province, have 14.2% of abnormal attitudes and eating behaviors (EAT-26 $\geq$ 12).[16] These studies show that abnormal attitudes and eating behaviors have tendency to be higher than previous studies. Self-objectification is related to eating disorders. The studies found that female adolescents and early adults who retrieved

values of thin-ideal body had higher risk of developing eating disorders and suffering from abnormal mental health outcomes.[17, 18] The studies which investigated in female college students, found that self-objectification was significantly correlated with depressive symptoms[17] and body shame which in turn was correlated with dieting behavior.[18] These studies show that self-objectification plays an important role to female mental health.

According to rationales and previous studies, there are a few studies about self-objectification and eating disorders in Thailand. Therefore, the aim of this study was to investigate self-objectification, eating disorders, and mental health of senior high school female students in Bangkok. We hypothesize that self-objectification is related to eating disorders and female mental health.

Materials and methods
Sample collections
This study was a cross-sectional descriptive study. The subjects were female students who were studying in Mathayom 6th, Bangkok Metropolis. Sample size was calculated according to Yamane's formula, "$n = N/(1 + Ne^2)$". Results in calculated sample size (n) was 392 samples. And adding 10.0% for protect missing data, total sample was 430. Sampling was multi-stage random sampling and final sampling was 6 schools in Bangkok. Inclusion criteria were: 1) subjects were high school students who were studying in Mathayom 6th of the academic year 2019; and, 2) willing to participate in this study. The exclusion was the students were absent on the studied day.

This study was approved by the Institutional Review Board (IRB), the Faculty of Medicine, Chulalongkorn University (COA no. 653/2019). All subjects were informed of the objectives and methods of this study and signed consent forms to participate in the study.

Measurements
Demographic data questionnaire consists of age, grade point average (GPAX), family status, living status, birth order, parents' income, personal illness, parents' illness, personal mental illness, current height and weight, ideal weight, and body mass index (BMI).

Self-objectification questionnaire from Objectified Body Consciousness Scale (OBS) of McKinley and Hyde (1996) that was translated and developed in Thai version by Attasaranya P. [5], and then was revised by Pattama-r-ruk P.[3] This

assessment consists of 3 domains, including body surveillance, body shame and control belief. Higher scores presenting higher self-objectification and higher in any domains. Attasaranya P.[5] reported internal consistency (Cronbach's alpha coefficient) in her sample that in 3 domains were 0.8, 0.8, and 0.6, respectively.[5] And this study found internal consistency with Cronbach's alpha coefficient in 3 domains were 0.7, 0.5, and 0.7, respectively.

The Eating Attitudes Test-26 in Thai version (EAT-26) was developed by Kaewporndawan T, et al.[12] from the perspectives of Garner and Garfinkel (1979). This assessment was used to evaluate attitudes and eating behaviors. Total scores from 0 to 78, and score of ≥ 12 was defined as at risk of developing eating disorders. This assessment has a good validity, high sensitivity (88.6%), and high specificity (88.7%).[12] Cronbach's alpha coefficient of this study was 0.7.

Thai Mental Health Indicator-15 (TMHI-15) was developed by Mongkol A, et al.[19] to assess mental health status in ordinary Thai people. Total scores were 60, presenting in 3 statuses: good, fair and poor mental health status. This assessment was reported internal consistency with Cronbach's alpha coefficient was 0.8.[19] And Cronbach's alpha coefficient of this study was 0.8.

Statistical analysis

The data were analyzed by using IBM SPSS Statistics version 22.0. The subjects' demographic data were presented by frequency and percentage. Study variables including mental health status (TMHI-15), self-objectification and 3 domains (body surveillance, body shame, and control belief), eating disorders with EAT-26 were presented by frequency and percentage. However, each domain of self-objectification was grouped by mean ± standard deviation (SD), as high, moderate, and low level. Inferential statistics were analyzed by chi-square, Pearson's correlation, logistic regression, and multiple regression analysis. Odds ratios (OR) were calculated with 95% confidence interval (CI). A P - value of less than 0.05 was considered statistically significant.

Results
Subjects' demographic data

The total subjects who gave their consents and completed questionnaires were 395. The mean age of the subjects was 17.7 ± 0.5 years. The mean of current height, current weight, and ideal weight of subjects were 160.4 ± 5.8 cm, and 54.8 ± 11.8 kg, and 48.7 ± 7.1 kg, respectively. The mean of BMI was 21.3 ± 4.2 kg/m², most subjects were in a normal range of BMI (55.7%). And most of mental health status of subjects was fair (39.7%). As the Table 1 shows the demographic data of the subjects in this study.

In Table 1, this study found that mean of self-objectification was 3.64 ± 0.5. In the domains of self-objectification, mean of body surveillance was 3.4 ± 0.7, mean of body shame was 3.3 ± 0.6, and mean of control belief was 4.2 ± 0.8. In addition, mean of eating disorders was 8.3 ± 6.5, including 23.8% in eating disorders (EAT scores ≥ 12), and 76.2% in no eating disorders (EAT scores < 12).

Table 2 shows that eating disorders was significantly associated with subjects' characteristics including father's educational level, mother's educational level, father's income, mother's income, and mental illness.

Table 3 shows that self-objectification was positively correlated with body surveillance ($r = 0.85$, $P < 0.01$), body shame ($r = 0.67, P < 0.01$), control belief ($r = 0.65, P < 0.01$) and eating disorders ($r = 0.34, P < 0.01$), but negatively correlated with mental health ($r = -0.15, P < 0.01$). Body surveillance was positively correlated with body shame ($r = 0.54$, $P < 0.01$), control belief ($r = 0.29, P < 0.01$), eating disorders ($r = 0.31, P < 0.01$), but negatively correlated with mental health (r = -0.18, $P < 0.01$). Body shame was positively correlated with body surveillance ($r = 0.54$, $P < 0.01$), eating disorders ($r = 0.33$, $P < 0.01$), and BMI ($r = 0.26, P < 0.01$), but negatively correlated with mental health ($r = -0.21, P < 0.01$). Control belief was positively correlated with body surveillance ($r = 0.29, P < 0.01$) and eating disorders ($r = 0.12$, $P < 0.05$). However, in this study found that control belief had no significant correlation with body shame, BMI, and mental health.

According to Table 4, the factors which were statistically significant predictors for eating disorders, namely, presence in mental illness (OR = 7.85), father's income ≥ 20,000 baht/month (OR = 1.87), mother's educational level was higher than bachelor's degree (OR = 1.81), and body surveillance in high level (OR = 3.16).

Multiple linear regression analysis to predict eating disorders was showed in Table 5. The predictor variables that were significantly associated with eating disorders including body shame ($\beta = 0.22$), and body surveillance ($\beta = 0.18$). The model predicted 13.2% of eating disorders.

Table 1. Subjects' characteristics and study variables (n = 395).

Characteristics	n	%	Characteristics / variables	n	%
Age (year)	(Mean = 17.7 ± 0.5)		**Subject's mental illness**		
	(Max = 19.0, Min = 17.0)		Presence	6	1.5
GPAX	(Mean = 3.2 ± 0.4)		Absence	389	98.5
Study program			**Current height (cm)**	(Mean = 160.4 ± 5.8)	
Science-Math	219	55.4	**Current weight (kg)**	(Mean = 54.8 ± 11.8)	
Arts-Math/languages	68	17.2	**Ideal weight (kg)**	(Mean = 48.7 ± 7.1)	
Living status			**Mental health status**	(Mean = 45.6 ± 6.1)	
Living with parents	278	70.4	Good	102	25.9
Others	117	29.6	Fair	157	39.7
Family status			Poor	136	34.4
Parents live together	287	72.7	**Body mass index (BMI)**	(Mean = 21.3 ± 4.2)	
Others	108	27.3	Underweight (< 18.5)	115	29.1
Birth order			Normal (18.5 - 24.9)	220	55.7
Only child	126	31.9	Overweight (25.0 - 29.9)	42	10.6
First born	84	21.3	Obese (≥ 30)	18	4.6
Middle born	36	9.1	**Self-objectification**	(Mean = 3.6 ± 0.5)	
Last born	149	37.7	**Body surveillance**	(Mean = 3.4 ± 0.7)	
Father's income (baht/month)			High	58	14.7
≥ 20,000	172	43.5	Moderate	275	69.6
< 20,000	223	56.5	Low	62	15.7
Mother's income (baht/month)			**Body shame**	(Mean = 3.3 ± 0.6)	
≥ 20,000	125	31.6	High	60	15.2
< 20,000	270	68.4	Moderate	271	68.6
Father's educational level			Low	64	16.2
High school and lower	285	72.1	**Control belief**	(Mean = 4.2 ± 0.8)	
Bachelor and higher	110	27.9	High	66	16.7
Mother's educational level			Moderate	272	68.9
High school and lower	273	69.0	Low	57	14.4
Bachelor and higher	122	31.0	**Eating disorders**	(Mean = 8.3 ± 6.5)	
Subject's illness			Risk	94	23.8
Presence	107	27.1	No risk	301	76.2
Absence	288	72.9			
Father's illness					
Presence	120	30.4			
Absence	275	69.6			
Mother's illness					
Presence	116	29.4			
Absence	279	70.6			

Table 2. Associations among subjects' characteristics and eating disorders (n = 395).

Characteristics	Eating disorders				χ^2	*P* - value
	Risk (EAT ≥ 12)		No risk (EAT < 12)			
	n	%	n	%		
Age						
< 18 years	59	62.8	188	62.5		
≥ 18 years	35	37.2	113	37.5	0.003	0.957
GPAX						
≥ 3.20	86	91.5	284	94.4	0.99	0.334[a]
< 3.20	8	8.5	17	5.6		
Study program						
Science-Math	51	54.3	168	55.8	0.07	0.652
Arts-Math/languages and others	43	45.7	133	44.2		
Living status						
Living with parents	70	74.5	217	72.1	0.203	0.652
Others	24	25.5	84	27.9		
Family status						
Parents live together	70	74.5	217	72.1	0.203	0.652
Others	24	35.5	84	27.9		
Birth order						
Only child	30	31.9	96	31.9	0.377	0.945
First born	18	19.1	66	21.9		
Middle born	9	9.6	27	9.0		
Last child	37	39.4	112	37.2		
Father's educational level						
High school and lower	46	48.9	188	62.5	5.424	0.02*
Bachelor and higher	48	51.1	113	37.5		
Mother's educational level						
High school and lower	42	44.7	192	63.8	10.83	0.001**
Bachelor and higher	52	55.3	109	36.2		
Father's income (baht/month)						
≥ 20,000	55	58.5	117	38.9	11.24	0.001**
< 20,000	39	41.5	184	61.1		
Mother's income (baht/month)						
≥ 20,000	41	43.6	84	27.9	8.173	0.004**
< 20,000	53	56.4	217	72.1		
Subject's illness						
Presence	29	30.9	78	25.9	0.884	0.347
Absence	65	69.1	223	74.1		
Father's illness						
Presence	30	31.9	90	29.9	0.137	0.711
Absence	64	68.1	211	70.1		
Mother's illness						
Presence	35	37.2	81	26.9	3.680	0.055
Absence	59	62.8	220	73.1		
Mental illness						
Presence	4	4.3	2	0.7	6.174	0.031[a]*
Absence	90	95.7	299	00.3		
BMI (kg/m²)						
Underweight	30	31.9	85	28.2	1.736	0.629
Normal	47	50.0	173	57.5		
Overweight	12	12.8	30	10.0		
Obese	5	5.3	13	4.3		

*$P < 0.05$, **$P < 0.01$, a = Fisher's exact test

Table 3. Correlations among study variables.

Variables	r						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Self-objectification	-						
Body surveillance	0.85**	-					
Body shame	0.67**	0.54**	-				
Control belief	0.65**	0.29**	0.02	-			
Eating disorders	0.34**	0.31**	0.33**	0.12*	-		
Mental health	- 0.15**	- 0.18**	- 0.21**	0.04	- 0.06	-	
Body mass index	0.13	0.05	0.26**	0.00	0.05	0.07	-

$*P < 0.05, **P < 0.01$

Table 4. Logistic regression analysis for predicting eating disorders by using Forward LR method.

Predictors for eating disorders	Adjusted OR	95% CI of Adjusted OR		P-value
		Lower	Upper	
Presence in mental illness	7.85	1.24	49.69	0.029*
Father's income ≥ 20,000 baht/month	1.87	1.12	3.10	0.015*
Mother's educational level was higher than bachelor	1.81	1.09	3.01	0.020*
Body surveillance in high level	3.16	1.73	5.80	< 0.001**
Constant	0.137			< 0.001**

$*P < 0.05, **P < 0.01$

Table 5. Multiple linear regression analysis of study variables to predict eating disorders by using Stepwise method.

Variables to predict eating disorders	B	SE	P-value	β	Tolerance	VIF
(constant)	- 5.27	1.78	0.003**		1.00	1.00
Body shame	2.43	0.59	< 0.001**	0.22	0.70	1.41
Body surveillance	1.60	0.48	0.001**	0.18	0.70	1.41

$R^2 = 0.132, F = 29.89, P < 0.001**$

Discussion

This study found that the mean BMI of female students in Mathayom 6th was $21.3 \pm 4.2 \, kg/m^2$, which was similar Chittiwan S, et al.[16] found that high school female students in Pathumthani Province had $21.0 \pm 4.3 \, kg/m^2$ in mean of BMI. Most female students in this study had a normal BMI (55.7%), and 4.6% in Obese. This study was like Puengyod A, et al.[15] found that female students in Bangkok had weight for height in normal level (72.8%). And Attasaranya P.[5] found that most female students had a normal BMI (56.1%) and 3.7% in Obese. The mean of mental health status in female students of this study was found 45.6 ± 6.1, and most students had fair mental health status (39.7%). This finding was like study of Petkum S.[20] which found that most of Mathayom 5th

students had fair mental health status. Additionally, the study of Iamwattanaseri N.[21] found that mental health status of the first-year college students was fair. These studies showed that students in similar age had fair mental health status.

This study investigated self-objectification of high school female students in Mathayom 6th. There are a few related studies in Thai samples, such as the study of Attasaranya P.[5] that investigated in Thai female college students in Thailand, 18 – 23 year-of-age. And, Jongkrerkkieat K, et al.[22] that investigated in female sample in upper ages, 18 – 34 year-of-age, and in various occupations. In addition, Pattama-r-ruk P.[3] studied self-objectification in gay and heterosexual male college students. In other countries, there are studies that investigated in various sample groups. In

similar study, Harrison K, *et al*.[9] studied in middle school and high school students, grade 6th – 12th, in the US, the study found that self-objectification was raised when the grade was upper, and grade 10th – 12th had the highest self-objectification.[9] In the study of Akanni OO, *et al*.[10] that studied in students in Nigeria, found that female students had body surveillance higher than male students, significantly. Lindberg SM, *et al*.[7] found that female adolescents in the US, had body surveillance higher than male adolescents. Moreover, Augustus-Horvath CL, *et al*.[23] found that females in age 18 - 24 years old had self-objectification through body surveillance higher than females in age upper 25 years old, significantly. These studies showed that self-objectification was found in younger age, especially high school female adolescents. Accordingly, this study found that in Mathayom 6th female students had mean of self-objectification was 3.6. And mean of each domains of self-objectification were 3.4 in body surveillance, 3.3 in body shame, and 4.2 in control belief. These findings were in accord with the study of Attasaranya P. found that female college students had the mean of body surveillance, body shame, and control belief were 3.4 ± 0.7, 3.2 ± 0.8, and 4.1 ± 0.8, respectively.[5]

In this study, female students who had eating disorders (EAT $\geq$ 12) were found 23.8%. This result was resembled the study of Chittiwan S, *et al*.[16] which found that high school female students in Pathumthani Province had 14.2% of abnormal attitudes and eating behaviors (EAT $\geq$ 12) that had developing eating disorders. And the study of Puengyod A, *et al*.[15] showing that middle and high school female students in Bangkok had 9.7% of abnormal attitudes and eating behaviors (EAT $\geq$ 20), especially, in 15-18 year-of-age female students were found 11.6%.[15] This result showed that eating disorders in female students which were assessed by EAT-26, were found higher in the previous studies.

This study found the association among characteristics of the subjects and eating disorders at significant level, namely, parents' educational level, parents' income and mental illness of subjects. These results were consistent with the study of Puengyod A, *et al*.[15] found that average income of family was significantly associated with abnormal attitudes and eating behaviors. Similarly, the study of Pengpid S, *et al*.[24] found that subjects in poorer subjective economic status had eating disorders higher that

subjects in wealthier subjective economic status. However, this study was different from results of Chittiwan S, *et al*. [16], showing that average income of family was not significantly associated with abnormal attitudes and eating behaviors. In addition, this study was found that age and BMI were not significantly associated with eating disorders. The results were consistent with the study of Puengyod A, *et al*.[15] which found that student's age and weight for height were not significantly associated with eating disorders.[15] But Chittiwan S, *et al*. [16] found that age and BMI were significantly associated with eating disorders. It could explain that study of Chittiwan S, *et al*. was investigated in Pathumthani Province and this study and study of Puengyod A, *et al*. were investigated in Bangkok metropolis. Thus, the results of the studies might be different.

Self-objectification was positively correlated with body surveillance, body shame, control belief and eating disorders, significantly. These results meant that if students had higher self-objectification, they had higher body surveillance, body shame, and control belief, and higher eating disorders. In the three domains of self-objectification were found that if students had higher body surveillance, they had higher following body shame and control belief, and had higher eating disorders. Students who felt shame on their appearance, would pay more attention on their appearance, and would have abnormal attitudes and eating behaviors which had eating disorders, in addition to pooper mental health status. Furthermore, this study found that body shame was the only domain of self-objectification that was positively correlated with BMI. It meant that when students' BMI was raised higher, they would highly feel shame on their appearance. These results were consistent with study of Muehlenkamp JJ, *et al*.[17] which investigated in female college students in the US, found that body shame was positively associated with disordered eating, significantly.[19] And the study of Cheng HL, *et al*.[25] that investigated in Asian American college women, found that body shame was positively associated with disordered eating and BMI. Mental health was negatively correlated with self-objectification, body surveillance and body shame, significantly. It meant that students were healthier mental health, they had lower self-objectification, lower body surveillance and body shame. Tiggemann M, *et al*.[18] found that early adolescents in Australia who had higher body shame was

positively associated with depressive symptoms. And Cristina C, et al.[26] found that the first year college students in Italy who had higher body shame, representing higher trait anxiety significantly. Moreover, in Thailand, Attasaranya P.[5] found that women who had lower body surveillance, they had lower body shame, and had higher self-esteem and self-compassion.

Logistic regression analysis was showed that there were four factors predicting eating disorders: presence in mental illness, father's income more than 20,000 baht/month, mother's educational level, and body surveillance in high level. These results were not consistent with study of Puengyod A, et al. [15] which found that family income less than 20,000 baht/month could predict abnormal eating attitudes and behaviors. However, the results were consistent with Manaboriboon B, et al.[27] found that desire to be thinner and self-perception of being too fat could predict eating disorders. Furthermore, multiple regression analysis in this study showed that both body surveillance and body shame could have eating disorders. These meant that if students had higher body surveillance and body shame, they might have eating disorders. These results were like the study of Harrison K, et al. [9] that showed that self-objectification could predict disordered eating in middle and high school female students. Similarly, Tiggemann M, et al.[18] found that body shame was a predictor to predict dieting behavior, significantly. Thus, this study showed that self-objectification was related eating disorders and might affect negative mental health outcomes in female students.

There were some limitations in this study. First, this study was investigated in Bangkok schools that could not generalize to other provinces in Thailand and other groups in different settings. Second, this study was cross-sectional descriptive study, it could not identify the casual relationships among variables. Future research should be conducted to investigate the relationships among self-objectification, eating disorders, and related factors in other settings and other provinces in Thailand and using other research methods such as qualitative study.

Conclusion

Self-objectification including body surveillance, body shame and control belief, were related with eating disorders and poorer mental health status in high school female students. This study was found that eating disorders (EAT ≥ 12) was 23.8%. The factors that were significantly associated with eating disorders were parents' educational level, parents' income, and mental illness of subjects. In addition, this study was found that body surveillance and body shame could significantly predict eating disorders. This study would be beneficial for understanding that self-objectification including body surveillance, body shame and control belief might affect negative mental health outcomes in high school female students.

Conflict of interest

The authors, hereby, declare no conflict of interest.

References

1. Sridachati S. Body perception, body-esteem and eating attitudes of female university students [thesis]. Bangkok: Chulalongkorn University; 2010.
2. Hongsanguansri S, Limsuwan N. Psychological development. In: Lotrakul M, Sukanich P, editors. Ramathibodi essential psychiatry. 4th ed. Bangkok: Department of Psychiatry Faculty of Medicine Ramathibodi Hospital; 2015.
3. Pattama-r-ruk P. Relationships among self-esteem, internalization of media influence, self-objectification, and body dissatisfaction in gay and heterosexual men [thesis]. Bangkok: Chulalongkorn University; 2017.
4. Fredrickson BL, Roberts TA. Toward understanding women's lived experiences and mental health risks. Psychol Women Q 1997;21:173-206.
5. Attasaranya P. Relationships among self-esteem, self-compassion, body mass index, self-objectification, and body image satisfaction in female adolescents [thesis]. Bangkok: Chulalongkorn University; 2012.
6. McKinley NM, Hyde JS. The objectified body consciousness scale development and validation. Psychol Women Q 1996;20:181-215.
7. Lindberg SM, Hyde JS, McKinley NM. A measure of objectified body consciousness for preadolescent

and adolescent youth. Psychol Women Q 2006;30: 65-76.

8. Knauss C, Paxton SJ, Alsaker FD. Relationships amongst body dissatisfaction, internalisation of the media body ideal and perceived pressure from media in adolescent girls and boys. Body Image 2007;4: 353-60.

9. Harrison K, Fredrickson BL. Women's sports media, self-objectification, and mental health in black and white adolescent females. J Commun 2003;53:216-32.

10. Akanni OO, Koleoso ON. Body image among secondary school boys and girls in south-west Nigeria: the role of neuroticism and self-esteem. Gender Behav 2017;15:9560-9.

11. Tiggemann M, Lynch JE. Body image across the life span in adult women: the role of self-objectification. Dev Psychol 2001;37:243-53.

12. Kaewporndawan T, Pariwatcharakul P, Pimratana W. Criterion validity study of the Eating Attitudes Test (EAT-26 Thai version) among Thai females. J Psychiatr Assoc Thai 2013;58:283-96.

13. Hongsanguansri S. Eating disorders. In: Lotrakul M, Sukanich P, editors. Ramathibodi essential psychiatry. Bangkok: Department of Psychiatry Faculty of Medicine Ramathibodi Hospital; 2015. p. 532-40.

14. U.S. Department of Health and Human Services, National Institutes of Health. Eating disorders: about more than food [Internet]. 2018 [cited 2020 Mar 20]. Available from: https://www.nimh.nih.gov/health/publications/eating-disorders/index.shtml.

15. Puengyod A, Sukanich P. Prevalence of abnormal eating attitudes and Behaviors among Thai female high school students in Bangkok. J Psychiatr Assoc Thai 2011;56:149-58.

16. Chittiwan S, Sukanich P. Relationship between Facebook addiction and abnormal eating attitudes and behaviors among female adolescents in Patumthani Province. J Psychiatr Assoc Thai 2017;62: 117-28.

17. Muehlenkamp JJ, Saris-Baglama RN. Self-objectification and its psychological outcomes for college women. Psychol Women Q 2002;26:371-9.

18. Tiggemann M, Slater A. The Role of Self-Objectification in the Mental Health of Early Adolescent Girls: Predictors and consequences. J Pediatr Psychol 2015;40:704-11.

19. Mongkol A, Vongpiromsan Y, Tangseree T, Huttapanom W, Romsai P, Chutha W. The development and testing of Thai mental health indicator version 2007. J Psychiatr Assoc Thai 2009;54:299-316.

20. Petkum S. Effects of mental health promotion program on mathayom 5 students of Triam Udom Suksa School [thesis]. Bangkok: Chulalogkorn University; 2010.

21. Iamwattanaseri N. Mental health and associated factors in first-year undergraduate students in a government university in Bangkok [thesis]. Bangkok: Chulalongkorn University; 2013.

22. Jongkrerkkieat K, Phaireekayhard T, Suwatcharapisit N. Relationship between selfie and attitude towards cosmetic surgery: the mediating role of self-objectification [Senior Project]. Bangkok: Chulalongkorn University; 2014.

23. Augustus-Horvath CL, Tylka TL. A Test and extension of objectification theory as it predicts disordered eating: Does women's age matter? J Couns Psychol 2009;56:253-65.

24. Pengpid S, Peltzer K. Risk of disordered eating attitudes and its relation to mental health among university students in ASEAN. Eat Weight Disord 2018;23:349-55.

25. Cheng HL, Tran A, Miyake ER, Kim HY. Disordered eating among Asian American college women: A racially expanded model of objectification theory. J Couns Psychol 2017;64:179-91.

26. Cristina C, Sara M, Roberta T, Sechi C. Do personal factors make women and men more susceptible to self-objectification and the development of dysfunctional eating attitudes? Curr Psychol 2020. doi:10.1007/s12144-020-00622-6.

27. Manaboriboon B, In-iw S, Winijkul G, Choowong T, Suwanwaree J, Apinuntavech S. Eating disorders susceptibility among university students in Thailand. Southeast Asian J Trop Med Public Health 2017;48: 19-28.