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Psychometric validation of the Dysmorphic Concern Questionnaire (DCQ) into Arabic

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Abstract

Background Research on dysmorphic concerns (DC) in Arabic-speaking contexts is hampered by the lack of validated tools. Because DC are culturally dependent, psychometrically sound measures are needed at the national level to closely and accurately investigate the construct in specific societies and populations. The purpose of the current research was to investigate the psychometric properties of Dysmorphic Concern Questionnaire (DCQ) in its Arabic translation in Lebanese adults.

Methods The study involved 515 participants (69.9% females, mean age of 27.55 ± 10.92 years) who completed a self-report, web-based questionnaire.

Results Confirmatory factor analysis indicated excellent construct validity, as the one-factor structure of the Arabic DCQ fits well with the data. McDonald's omega was 0.89 in our sample, evidencing an excellent level of internal consistency. Furthermore, the results from the multigroup analysis showed that the DCQ holds similar structural model between genders at the metric, configural, and scalar levels. Finally, DC levels correlated inversely with body appreciation and self-esteem and positively with disordered eating symptoms, thus supporting the concurrent and convergent validity of the Arabic DCQ.

Conclusion The DCQ translated into Arabic appears to have a valid self-assessment measure to capture the presence of DC manifestations. It is anticipated that the Arabic DCQ will be advantageous for healthcare professionals and researchers working with Arabic-speaking people around the world.

Keywords Dysmorphic concerns, Dysmorphic Concern Questionnaire, Body dysmorphic disorder, Psychometric properties, Arabic

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Introduction

Dysmorphic concerns (DC) refer to excessive preoccupations with certain imagined or barely perceptible physical appearance defects [1–3], which are either specific (e.g., acne, large nose, balding) or vague reflecting a general view of ugliness. These preoccupations are experienced as intrusive, are hard to control, and difficult to resist [4]. The DC construct also involves subsequent behaviors directed at controlling the defect(s), social avoidance [3], significant distress, and/or impaired functioning [5]. Body dysmorphic symptoms are distributed along a continuum throughout the general population, with symptoms not differing qualitatively at varying levels of severity [6]. Therefore, DC may reflect a proneness to development of diagnosable body dysmorphic disorder (BDD) or indicate a relevant diagnosis of subclinical or clinical BDD [7, 8].

Beyond a greater risk for developing BDD, subthreshold body dysmorphic symptoms were associated with reduced quality of life [9, 10] and higher degrees of coexisting psychiatric conditions (major depressive disorder [11], obsessive compulsive disorder [12, 13], social anxiety [14], compulsive sexual behavior [15], eating disorders [16], and substance use disorder [17]). DC are also associated with a high desire for cosmetic surgery, which may, in turn, confer a risk of addiction to surgery and subsequent adverse events [18] and was proven not effective in relieving symptoms [19]. Besides, people with DC were shown to often experience general and body shame [20], decreased self-esteem [21], and increased odds for suicide thoughts and attempts [22]. DC are more likely to emerge during adolescence [23]. They seem to affect an estimated 0.7 to 3.2% of the general public [24, 25], 2.3 to 5.8% of university students [26, 27], and 6.9 to 17.2% of plastic surgery and dermatological outpatients [28, 29]. However, these prevalence rates are likely underestimated because most patients do not seek help or do so only when they are at advanced stages of the disease [30]. Given the high prevalence estimates of DC and their subsequent harmful concerns on physical and mental wellbeing, investigating the psychometric properties of measurement instruments, which intend to evaluate the DC construct, is warranted.

Multiple measurement tools were developed to capture DC symptoms and are used either as screening tools or for clinical diagnostics. There are semi-structured, clinician-administered measures that are recommended for clinical assessment of BC, such as the BDD Diagnostic Module for DSM-5 (BDDDM) [31], the 34-item semi-structured clinical interview Body Dysmorphic Disorder Examination [32], and the Yale-Brown Obsessive–Compulsive Scale, modified for BDD (BDD-YBOCS; [33]). These measures offer the advantage of obtaining accurate ratings and being practical for treatment outcomes, as they allow for a detailed evaluation of typical symptoms that can be treatment targets. However, they may be less convenient as screening measures as they are too time-consuming. Moreover, they do not enable the detection of comprehensive information (e.g., specific symptoms, such as cognitions) related to DC [34]. Acknowledging the gaps in screening for DC, Mancuso et al. [35] designed and validated the Dysmorphic Concern Questionnaire (DCQ), a 7-item self-report tool intended for screening BDD.

The DCQ is a 7-item measure scored on a 4-point scale, aiming to assess concerns related to physical appearance as a potential symptom, eliminating the necessity to diagnose BDD [35]. Therefore, the DCQ enables assessing subclinical and clinical DC, without prejudging the pathology and etiology of the disorder [36]. The DCQ was found to have a single-factor structure and an appropriate internal consistency (Cronbach's alpha of 0.88). The scale also showed good validity, as attested by adequate patterns of correlations with distress, social impairment, and work [2]. Due to its relative shortness, simplicity, and low cost, the DCQ was widely used for clinical purposes and in large epidemiological studies [35, 37]. In addition, several psychometric studies demonstrated the adequate reliability and validity of the DCQ in various countries and languages, including Persian [38], Spanish [8], Greek [39], and German [40]. The DCQ was also subject to validation in different populations and contexts, such as university students [38], nonclinical adolescents and young adults [41], UK adult twins [42], sexual minority adults [43], psychiatric inpatients [36], dermatological outpatients [44], and individuals suffering from BDD [39]. All these studies further confirmed the psychometric robustness of the instrument in terms of internal consistency and validity. However, no translation or validation of the DCQ is available for Arabic-speaking populations to date to our knowledge [45].

The present study

The way individuals perceive and deal with their body areas of concern and body image in BDD are largely determined by sociocultural norms [46]. Historically, thinness was considered undesirable in the Arabic culture and societies, which rather give preference to plump bodies as symbol of femininity. However, under the influence of modernization and westernization, Arab countries have known gradual changes in beauty ideals, with continuously rising levels of dissatisfaction and concerns about body shape or image [47]. For instance, a previous study indicated that prevalence estimates of BDD in Arab people from the general population of Saudi Arabia (8.8%) were higher than those reported in international

studies from Western countries, a finding that was partly explained by social and cultural factors [48]. It is of note, however, that authors used a screening measure, i.e., the Body Dysmorphic Disorder Questionnaire (BDDQ, [49]), in its Arabic-translated version without testing its psychometric properties [48]. This points to the fact that research on DC in Arabic-speaking contexts is hampered by the lack of validated tools. Because DC are culturally dependent, psychometrically sound measures are needed at the national level to closely and accurately investigate the construct in specific societies and populations. In this study, we aimed to investigate the psychometric properties of the DCQ in its Arabic translation in Lebanese adults. We postulated the following hypotheses regarding the Arabic DCQ: (1) it will exhibit strong uni-structural validity, (2) it will demonstrate reliable internal consistency, (3) its structure will remain invariant between genders, and (4) it will show satisfactory convergent and concurrent validity as indicated by substantial relationships with assessments of disordered eating, body appreciation, and self-esteem.

Methods

Procedures

Between February and March 2023, data for this cross-sectional study was collected through a Google Form link. The research team invited people to complete the survey; those who agreed were requested to share the link with others, following the snowball sampling technique. Inclusion criteria comprised being an adult who resides in and is a citizen of Lebanon. Exclusions encompassed individuals declining to complete the questionnaire. The survey was conducted anonymously, and participation was voluntary and without compensation [50].

Translation procedure

Prior to utilization in the current study, the DCQ scale underwent translation for adaptation for the Arabic language and cultural context. The translation aimed to attain semantic equivalence between the original measures and their Arabic counterparts, adhering to international recommendations [51]. A Lebanese translator, unaffiliated with the study, independently translated the English version into Arabic. Following that, a Lebanese psychologist, proficient in English, translated the Arabic version back into English. To ensure accuracy, a committee of experts, comprising two psychiatrists, one psychologist, and the research team, compared the original and translated English versions, identifying and correcting any inconsistencies [52]. Following this, a pilot study involving 30 patients was conducted to validate the clarity of all questions. No modifications were made after the completion of the pilot study.

Measures

Dysmorphic Concern Questionnaire (DCQ)

The DCQ is composed of seven items assessing concerns about and belief in physical appearance (e.g., "Have you ever been very concerned about some aspect of your physical appearance?" or "Have you ever spent a lot of time covering up defects in your appearance/bodily functioning?") [2]. Participants rate seven items on a 4-point scale, with higher values indicating greater DC.

Eating Attitude Test (EAT-7)

The condensed version of the EAT-26 [53, 54] comprises seven items, each assessed on a 6-point Likert scale [55]. Elevated scores indicate more pronounced symptoms of disordered eating ($\omega = 0.84$).

Body Appreciation Scale (BAS-2)

Validated in Arabic [56, 57], it comprises 10 items measured on a 5-point scale, extending from "never to always" [58]. Higher levels point to higher levels of body appreciation ($\omega = 0.96$).

The Single-Item Self-Esteem scale (SISE)

Validated in Arabic [59], it is composed of one item (i.e., "I have high self-esteem") [60], measured on a 5-point Likert scale from "not at all true of me to very true of me." Higher scores reflect higher levels of self-esteem.

Analytic strategy

Confirmatory factor analysis (CFA)

The dataset contained no missing responses. Utilizing data from the entire sample, we conducted a CFA using SPSS AMOS v.29 software. Our sample size exceeded the minimum requirement of 140 participants, considering a ratio of 20 participants per scale item for conducting a CFA [61]. Our objective was to assess the original one-factor model of the DCQ. Parameter estimates were obtained through the maximum likelihood method, and model fit was evaluated using various indices, including the normed model chi-square (χ^2/df), the Steiger-Lind root-mean-square error of approximation (RMSEA), the Tucker-Lewis index (TLI), and the comparative fit index (CFI). Adequate fit was indicated by values ≤ 5 for χ^2/df, ≤ 0.08 for RMSEA, and ≥ 0.90 for CFI and TLI [62]. Additionally, convergent validity was examined through average variance extracted (AVE) values, with ≥ 0.50 considered satisfactory [63]. Multivariate normality was not established (Bollen-Stine bootstrap $p = 0.026$), prompting the use of nonparametric bootstrapping procedure.

For the examination of gender invariance in DCQ scores, a multigroup CFA was conducted on the total

sample [64], assessing configural, metric, and scalar levels of measurement invariance [65]. Invariance was acknowledged with $\Delta CFI \leq 0.010$, $\Delta RMSEA \leq 0.015$, or $\Delta SRMR \leq 0.010$ [50].

Further analyses included assessing composite reliability using McDonald's ω, with values greater than 0.70 considered acceptable [66]. Normality was confirmed as skewness, and kurtosis values ranged between -1 and $+1$ [67]. Pearson test was employed for correlations of scores and Student t-test for means comparison.

Results
Participants
A total of 515 individuals participated in this study (69.9% females, mean age: 27.55 ± 10.92 years, and 83.7% with a university level of education).

Confirmatory factor analysis of the DCQ scale
CFA showed that fit of the one-factor structure of the DCQ scale was acceptable: $\chi^2/df = 48.37/14 = 3.46$, $RMSEA = 0.069$ (90% CI 0.048, 0.091), $SRMR = 0.027$, $CFI = 0.980$, and $TLI = 0.970$. The standardized estimates of factor loadings were all adequate (Fig. 1). The

convergent validity for this model was borderline, as $AVE = 0.73$ ($\omega = 0.89$).

Gender invariance
The invariance across gender of the DCQ at the metric, configural, and scalar levels was demonstrated (Table 1). There is no statistically significant difference between men and women regarding DCQ scores (5.86 ± 5.14 vs 6.63 ± 5.10; $t = -1.549$; $p = 0.122$).

Convergent and concurrent validity
Elevated DCQ scores demonstrated a significant correlation with higher EAT scores, indicating a greater level of disordered eating ($r = 0.15$) and lower body appreciation ($r = -0.43$) and reduced self-esteem ($r = -0.18$) (Table 2).

Discussion
Despite its high prevalence and negative health effects, DC remain under-researched and poorly understood worldwide [68]. It is therefore no surprise that Arab people are largely under-represented in the literature on DC. Thus, there appears a clear need for clinically useful,
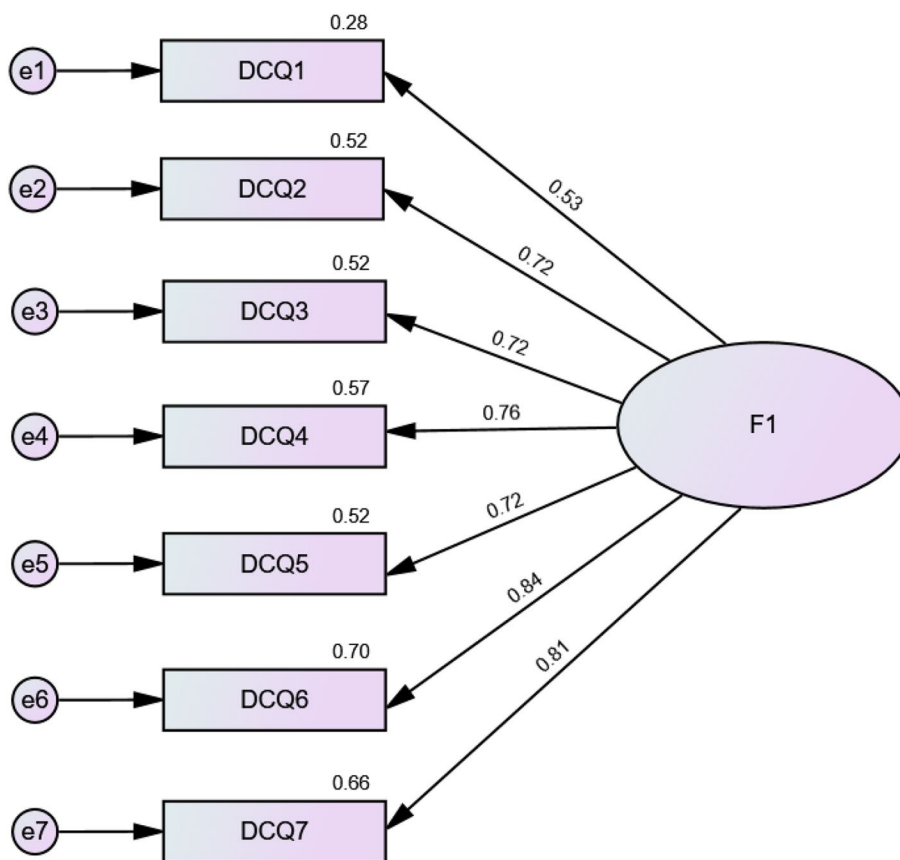

Fig. 1 Standardized loading factors of the Dysmorphic Concern Questionnaire (DCQ) items in Arabic

Table 1 Measurement invariance of the Dysmorphic Concern Questionnaire (DCQ) across gender in the total sample

Model	CFI	RMSEA	SRMR	Model comparison	ΔCFI	ΔRMSEA	ΔSRMR
Configural	0.976	.055	.038				
Metric	0.977	.048	.041	Configural vs metric	.001	.007	.003
Scalar	0.975	.046	.041	Metric vs scalar	.002	.002	< .001

SRMR, standardized root-mean-square residual *CFI*, comparative fit index *RMSEA*, Steiger-Lind root-mean-square error of approximation

Table 2 Correlation matrix

	1	2	3	4
1. Dysmorphic concern	1			
2. Disordered eating	0.15**	1		
3. Body appreciation	− 0.43***	− 0.19***	1	
4. Self-esteem	− 0.18**	− 0.10	0.29***	1

**p < .01; ***p < .001

psychometrically acceptable, and easy to apply measures to assess DC among Arabic-speaking populations. In an effort to contribute to the progression of the field, our aim was to validate the DCQ into Arabic. The present results indicate that the one-factor model of the DCQ was reproduced in our nonclinical adult sample for both males and females. The scale showed adequate internal consistency (McDonalds' omega of 0.89), as well as good convergent validity. In general, these findings imply that the Arabic DCQ is appropriate for use as a screening tool to detect Arabic-speaking individuals with excessive dysmorphic concerns, who could be at risk of developing BDD.

CFA indicated excellent construct validity, as the single-factor model of the Arabic DCQ showed a good fit to the data. This suggests that all seven items assess the same construct. Consistent with our results, previous findings using CFA and principal component analysis have indicated a unidimensional solution in various populations and contexts, including German community adults [40], UK adult twins [42], Australian community youth aged 12–21 years [41], Australian psychiatric patients [2], Iranian university students [38], multiethnic sexual minority individuals residing in the USA [43], Spanish university students and nonuniversity general population [8], and Greek adults with BDD and healthy controls [39]. Collectively, these results affirm the cross-cultural validity of the one-factor model of the DCQ. The benefit of the latter lies in its ease of calculating a total score, making it conducive for use in screening studies.

McDonald's omega was 0.89 in our sample, evidencing an excellent level of internal consistency. Similarly, the various linguistic versions of the DCQ available showed adequate internal consistency values, including the English (Cronbach's α ranging from 0.80 to 0.88) [2, 36, 41–43], Persian ($\alpha = 0.78$) [38], Spanish ($\alpha = 0.85$) [8], German ($\alpha = 0.81$) [40], and Greek ($\alpha = 0.933$) [39] versions. Furthermore, and as expected, the results from the multigroup analysis found that the DCQ in its Arabic version holds similar factor structure between gender groups at the metric, configural, and scalar levels. This suggests that Arab male and female respondents ascribed the same meaning to DCQ items, thus implying that the latent means can be compared across gender. Although several previous studies have assessed the psychometric qualities of the DCQ within both clinical and nonclinical populations, there is surprisingly little information available on invariance properties of DCQ scores, thereby limiting its potential use for gender comparisons. We could find only one study that provided support to the invariance of the DCQ across gender in sexual minority individuals [43]. Accordingly, we draw the attention of researchers to the need to establish cross-gender measurement equivalence before exploring any potential differences in group means [69]. In the current sample, there was no statistically significant difference observed between Arab females and males in terms of DCQ latent mean scores. Prior research pointed to substantial differences in major symptom phenomenology across gender in adults with BDD [70]. For instance, females seem to be more preoccupied by their breasts and thighs and more likely to exhibit BDD-related behaviors, while males seem to be more concerned with their muscularity and more likely to report high BDD-related disability [70–72]. Although there may be symptom-based gender differences, there are also similarities in the frequency and severity of appearance concerns between genders [71, 72], which is broadly in line with our findings.

Finally, the hypothesized patterns of correlations between DC scores and other relevant measures were confirmed, supporting the concurrent and convergent validity of the Arabic language DCQ. In particular, DC levels correlated inversely with body appreciation and self-esteem and positively with disordered eating symptoms. In agreement with these findings, there is solid research suggesting that preoccupation for perceived physical defect(s) and related behaviors is predictive

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of disordered eating [73, 74] and low self-esteem [21]. Additionally, body image disturbance represents a hallmark characteristic of DC [75]. These observations further highlight the usefulness of DCQ as a measure of DC symptoms' severity and its clinical relevance in a series of health problems. Therefore, the translated Arabic measure can be considered suitable for specific assessment of the phenotypic continuum of DC across the general population and, therefore, identification of individuals at risk of developing BDD. However, we caution readers that the DCQ does not allow for establishing a final BDD diagnosis, and that a structured diagnostic interview is still required to confirm the existence of a diagnosable disorder.

Study limitations and research perspectives
The adoption of self-report measures and convenience web-based sampling method may introduce response bias and limit the representativeness of the study's sample. Our participants consisted of nonclinical Arabic-speaking adults from one Arab country (i.e., Lebanon); consequently, our findings may not be applicable to other Arab countries. Future validation studies are needed to verify the scale's vigor in clinical populations (e.g., patients with BDD, patients undergoing plastic surgery, or other cosmetic procedures) and across other Arab settings (e.g., Gulf or North African countries). Finally, some essential psychometric properties (e.g., test–retest reliability) were not studied in this work.

Conclusion
Our addition to the current body of literature lies in expanding the understanding of the psychometric qualities of the DCQ in a new language and context. Results suggest that the DCQ in its Arabic translated and validated version may serve as a reliable self-report screening tool for capturing manifestations of DC. In addition, our study stands among pioneers in confirming measurement invariance of this scale across gender, which can help inform future studies aiming at investigating differences in levels of DC between males and females in Arab contexts. As the BCQ has been validated and used in many countries throughout the world, making its Arabic version available will allow for accurate cross-national comparison on DC to be made. We hope that the Arabic validated version of the DCQ will benefit clinicians and researchers working with Arabic-speaking populations in different parts of the world.

References
1. Beilharz F, Phillipou A, Castle D, Jenkins Z, Cistullo L, Rossell S (2019) Dysmorphic concern in anorexia nervosa: implications for recovery. Psychiatry Res 273:657–661
2. Oosthuizen P, Lambert T, Castle DJ (1998) Dysmorphic concern: prevalence and associations with clinical variables. Aust N Z J Psychiatry 32(1):129–132
3. Onden-Lim M, Grisham JR (2013) Intrusive imagery experiences in a high dysmorphic concern population. J Psychopathol Behav Assess 35:99–105
4. Phillips KA, McElroy SL, Keck PE Jr, Pope HG Jr, Hudson JI (1993) Body dysmorphic disorder: 30 cases of imagined ugliness. Am J Psychiatry 150(2):302-8. https://doi.org/10.1176/ajp.150.2.302
5. Phillips K (2017) Body dysmorphic disorder: advances in research and clinical practice
6. Bala M, Quinn R, Jassi A, Monzani B, Krebs G (2021) Are body dysmorphic symptoms dimensional or categorical in nature? A taxometric investigation in adolescents. Psychiatry Res 305:114201
7. Gieler T, Schmutzer G, Braehler E, Schut C, Peters E, Kupfer J (2016) Shadows of beauty–prevalence of body dysmorphic concerns in Germany is increasing: data from two representative samples from 2002 and 2013. Acta Derm Venereol 96:83–90
8. Senín-Calderón C, Valdés-Díaz M, Benítez-Hernández MM, Núñez-Gaitán MC, Perona-Garcelán S, Martínez-Cervantes R, Rodríguez-Testal JF (2017) Validation of Spanish language evaluation instruments for body dysmorphic disorder and the dysmorphic concern construct. Front Psychol 8:1107
9. Schneider SC, Mond J, Turner CM, Hudson JL (2017) Subthreshold body dysmorphic disorder in adolescents: prevalence and impact. Psychiatry Res 251:125–130
10. IsHak WW, Bolton MA, Bensoussan J-C, Dous GV, Nguyen TT, Powell-Hicks AL, Gardner JE, Ponton KM (2012) Quality of life in body dysmorphic disorder. CNS Spectr 17(4):167–175
11. Buhlmann U, Glaesmer H, Mewes R, Fama JM, Wilhelm S, Brähler E, Rief W (2010) Updates on the prevalence of body dysmorphic disorder: a population-based survey. Psychiatry Res 178(1):171–175

12. Frías Á, Palma C, Farriols N, González L (2015) Comorbidity between obsessive-compulsive disorder and body dysmorphic disorder: prevalence, explanatory theories, and clinical characterization. Neuropsychiatr Dis Treat 11:2233-44. https://doi.org/10.2147/NDT.S67636

13. Toh WL, Castle DJ, Mountjoy RL, Buchanan B, Farhall J, Rossell SL (2017) Insight in body dysmorphic disorder (BDD) relative to obsessive-compulsive disorder (OCD) and psychotic disorders: revisiting this issue in light of DSM-5. Compr Psychiatry 77:100–108

14. Fang A, Hofmann SG (2010) Relationship between social anxiety disorder and body dysmorphic disorder. Clin Psychol Rev 30(8):1040-8. https://doi.org/10.1016/j.cpr.2010.08.001

15. Grant JE, Lust K, Chamberlain SR (2019) Body dysmorphic disorder and its relationship to sexuality, impulsivity, and addiction. Psychiatry Res 273:260–265

16. Kollei I, Schieber K, de Zwaan M, Svitak M, Martin A (2013) Body dysmorphic disorder and nonweight-related body image concerns in individuals with eating disorders. Int J Eat Disord 46(1):52–59

17. Houchins JR, Kelly MM, Phillips KA (2019) Motives for illicit drug use among individuals with body dysmorphic disorder. J Psychiatr Pract 25(6):427–436

18. Phillips KA, Dufresne RG (2000) Body dysmorphic disorder: a guide for dermatologists and cosmetic surgeons. Am J Clin Dermatol 1:235–243

19. Phillips KA, Grant J, Siniscalchi J, Albertini RS (2001) Surgical and nonpsychiatric medical treatment of patients with body dysmorphic disorder. Psychosomatics 42(6):504–510

20. Weingarden H, Renshaw KD, Davidson E, Wilhelm S (2017) Relative relationships of general shame and body shame with body dysmorphic phenomenology and psychosocial outcomes. Journal of obsessive-compulsive and related disorders 14:1–6

21. Kuck N, Cafitz L, Bürkner P-C, Hoppen L, Wilhelm S, Buhlmann U (2021) Body dysmorphic disorder and self-esteem: a meta-analysis. BMC Psychiatry 21(1):310

22. Angelakis I, Gooding PA, Panagioti M (2016) Suicidality in body dysmorphic disorder (BDD): a systematic review with meta-analysis. Clin Psychol Rev 49:55–66

23. Bjornsson AS, Didie ER, Grant JE, Menard W, Stalker E, Phillips KA (2013) Age at onset and clinical correlates in body dysmorphic disorder. Compr Psychiatry 54(7):893–903

24. Barahmand U, Shahbazi Z (2015) Prevalence of and associations between body dysmorphic concerns, obsessive beliefs and social anxiety. Asia Pac Psychiatry 7(1):54–63

25. Schieber K, Kollei I, de Zwaan M, Martin A (2015) Classification of body dysmorphic disorder—what is the advantage of the new DSM-5 criteria? J Psychosom Res 78(3):223–227

26. Bartsch D (2007) Prevalence of body dysmorphic disorder symptoms and associated clinical features among Australian university students. Clin Psychol 11(1):16–23

27. Taqui AM, Shaikh M, Gowani SA, Shahid F, Khan A, Tayyeb SM, Satti M, Vaqar T, Shahid S, Shamsi A (2008) Body dysmorphic disorder: gender differences and prevalence in a Pakistani medical student population. BMC Psychiatry 8(1):1–10

28. Dey JK, Ishii M, Phillis M, Byrne PJ, Boahene KD, Ishii LE (2015) Body dysmorphic disorder in a facial plastic and reconstructive surgery clinic: measuring prevalence, assessing comorbidities, and validating a feasible screening instrument. JAMA facial plastic surgery 17(2):137–143

29. Ritter V, Fluhr JW, Schliemann-Willers S, Elsner P, Strauß B, Stangier U (2016) Body dysmorphic concerns, social adaptation, and motivation for psychotherapeutic support in dermatological outpatients. J Dtsch Dermatol Ges 14(9):901–908

30. Castle DJ, Molton M, Hoffman K, Preston NJ, Phillips KA (2004) Correlates of dysmorphic concern in people seeking cosmetic enhancement. Aust N Z J Psychiatry 38(6):439–444

31. Phillips KA (2005) The broken mirror: understanding and treating body dysmorphic disorder. Oxford University Press, USA

32. Rosen JC, Reiter J (1996) Development of the body dysmorphic disorder examination. Behav Res Ther 34(9):755–766

33. Phillips KA, Hollander E, Rasmussen SA, Aronowitz BR (1997) A severity rating scale for body dysmorphic disorder: development, reliability, and validity of a modified version of the Yale-Brown Obsessive Compulsive Scale. Psychopharmacol Bull 33(1):17

34. Wilhelm S, Greenberg JL, Rosenfield E, Kasarskis I, Blashill AJ (2016) The Body Dysmorphic Disorder Symptom Scale: development and preliminary validation of a self-report scale of symptom specific dysfunction. Body Image 17:82–87

35. Mancuso SG, Knoesen NP, Castle DJ (2010) The Dysmorphic Concern Questionnaire: a screening measure for body dysmorphic disorder. Aust N Z J Psychiatry 44(6):535–542

36. Jorgensen L, Castle D, Roberts C, Groth-Marnat G (2001) A clinical validation of the Dysmorphic Concern Questionnaire. Aust N Z J Psychiatry 35(1):124–128

37. Liao Y, Knoesen NP, Deng Y, Tang J, Castle DJ, Bookun R, Hao W, Chen X, Liu T (2010) Body dysmorphic disorder, social anxiety and depressive symptoms in Chinese medical students. Soc Psychiatry Psychiatr Epidemiol 45:963–971

38. Khanjani S, Foroughi AA, Asmari Bardezard Y (2019) The psychometric properties of the Persian Version of Dysmorphic Concern Questionnaire. Practice in Clinical Psychology 7(4):263–270

39. Kapsali F, Nikolaou P, Papageorgiou C (2020) Dysmorphic Concern Questionnaire: Greek translation, validation and psychometric properties. Open Journal of Psychiatry 10(03):101

40. Schieber K, Kollei I, de Zwaan M, Martin A (2018) The Dysmorphic Concern Questionnaire in the German general population: psychometric properties and normative data. Aesthetic Plast Surg 42(5):1412–1420

41. Davies KL, Hanley SM, Bhullar N, Wootton BM (2022) A psychometric validation of the Dysmorphic Concerns Questionnaire (DCQ) in adolescents and young adults. Aust Psychol 57(5):280–289

42. Monzani B, Rijsdijk F, Anson M, Iervolino A, Cherkas L, Spector T, Mataix-Cols D (2012) A twin study of body dysmorphic concerns. Psychol Med 42(9):1949–1955

43. Rozzell KN, Carter C, Convertino AD, Gonzales M IV, Blashill AJ (2020) The Dysmorphic Concern Questionnaire: measurement invariance by gender and race/ethnicity among sexual minority adults. Body Image 35:201–206

44. Stangier U, Janich C, Adam-Schwebe S, Berger P, Wolter M (2003) Screening for body dysmorphic disorder in dermatological outpatients. Dermatology and Psychosomatics/Dermatologie und Psychosomatik 2:66–71

45. Abdelhamid AS, Elzayat S, Amer MA, Elsherif HS, Lekakis G, Most SP (2023) Arabic translation, cultural adaptation, and validation of the BDDQ-AS for rhinoplasty patients. Journal of Otolaryngology-Head & Neck Surgery 52(1):11

46. Dixon L, Marques L (2017) Cultural, racial, and ethnic aspects of body dysmorphic disorder and treatment implications. In: Phillips K (ed) Body Dysmorphic Disorder, Advances in Research and Clinical Practice. Oxford University Press, New York

47. Alharballeh S, Dodeen H (2023) Prevalence of body image dissatisfaction among youth in the United Arab Emirates: gender, age, and body mass index differences. Curr Psychol 42(2):1317-1326. https://doi.org/10.1007/s12144-021-01551-8

48. Alghamdi WA, Subki AH, Khatib HA, Butt NS, Alghamdi RA, Alsallum MS, Alharbi AA, Almatrafi MN, Alobisi AA, Al-Zaben F (2022) Body dysmorphic disorder symptoms: prevalence and risk factors in an Arab Middle Eastern Population. Int J Gen Med 2905–2912

49. Phillips K: Diagnostic instruments for body dysmorphic disorder. New research programs and abstracts. 57. In: *American Psychiatric Association 148th Annual Meeting, 1995: 1995*: American Psychiatric Association; 1995.

50. Swami V, Todd J, Azzi V, Malaeb D, El Dine AS, Obeid S, Hallit S (2022) Psychometric properties of an Arabic translation of the Functionality Appreciation Scale (FAS) in Lebanese adults. Body Image 42:361–369

51. Van Widenfelt BM, Treffers PD, De Beurs E, Siebelink B, Koudijs E, Siebelink BM (2005) Translation and cross-cultural adaptation of assessment instruments used in psychological research with children and families. Clin Child Fam Psychol Rev 8(2):135

52. Fenn J, Tan C-S, George S (2020) Development, validation and translation of psychological tests. BJPsych Adv 26(5):306–315

53. Haddad C, Khoury C, Salameh P, Sacre H, Hallit R, Kheir N, Obeid S, Hallit S (2021) Validation of the Arabic version of the Eating Attitude Test in Lebanon: a population study. Public Health Nutr 24(13):4132–4143

54. Garner DM, Garfinkel PE (1979) The Eating Attitudes Test: an index of the symptoms of anorexia nervosa. Psychol Med 9(2):273–279

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55. Fekih-Romdhane F, Obeid S, Malaeb D, Hallit R, Hallit S (2022) Validation of a shortened version of the Eating Attitude Test (EAT-7) in the Arabic language. J Eat Disord 10(1):1–8

56. Fekih-Romdhane F, Azzi V, Malaeb D, Sarray El Dine A, Obeid S, Hallit S (2023) Psychometric properties of an Arabic translation of the body appreciation scale (BAS-2) and its short forms (BAS-2SF) in a community sample of Lebanese adults. J Eat Disord 18;11(1):160. https://doi.org/10.1186/s40337-023-00885-x

57. Swami V, Tran US, Stieger S, Aavik T, Ranjbar HA, Adebayo SO, Afhami R, Ahmed O, Aime A, Akel M et al (2023) Body appreciation around the world: measurement invariance of the Body Appreciation Scale-2 (BAS-2) across 65 nations, 40 languages, gender identities, and age. Body Image 46:449–466

58. Tylka TL, Wood-Barcalow NL (2015) The Body Appreciation Scale-2: item refinement and psychometric evaluation. Body Image 12:53–67

59. Fekih-Romdhane F, Bitar Z, Rogoza R (2023) Sarray El Dine A, Malaeb D, Rashid T, Obeid S, Hallit S: Validity and reliability of the Arabic version of the Self-Report Single-Item Self-Esteem scale (A-SISE). BMC Psychiatry 23(1):351

60. Robins RW, Hendin HM, Trzesniewski KH (2001) Measuring global self-esteem: construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. Pers Soc Psychol Bull 27(2):151–161

61. Mundfrom DJ, Shaw DG, Ke TL (2005) Minimum sample size recommendations for conducting factor analyses. Int J Test 5(2):159–168

62. Lt Hu (1999) Bentler PM: Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct Equ Modeling 6(1):1–55

63. Malhotra N, Dash S (2011) Marketing research: an applied orientation (; Pearson, Ed.). In.: Delhi

64. Chen FF (2007) Sensitivity of goodness of fit indexes to lack of measurement invariance. Struct Equ Modeling 14(3):464–504

65. Vadenberg R, Lance C (2000) A review and synthesis of the measurement in variance literature: suggestions, practices, and recommendations for organizational research. Organ Res Methods 3:4–70

66. Dunn TJ, Baguley T, Brunsden V (2014) From alpha to omega: a practical solution to the pervasive problem of internal consistency estimation. Br J Psychol 105(3):399–412

67. Hair Jr JF, Sarstedt M, Ringle CM, Gudergan SP: Advanced issues in partial least squares structural equation modeling: saGe publications; 2017.

68. Krebs G, de la Cruz LF, Mataix-Cols D (2017) Recent advances in understanding and managing body dysmorphic disorder. BMJ Ment Health 20(3):71–75

69. Putnick DL, Bornstein MH (2016) Measurement invariance conventions and reporting: the state of the art and future directions for psychological research. Dev Rev 41:71–90

70. Malcolm A, Pikoos TD, Castle DJ, Rossell SL (2021) An update on gender differences in major symptom phenomenology among adults with body dysmorphic disorder. Psychiatry Res 295:113619

71. Schneider SC, Mond J, Turner CM, Hudson JL (2019) Sex differences in the presentation of body dysmorphic disorder in a community sample of adolescents. J Clin Child Adolesc Psychol 48(3):516–528

72. Phillips KA, Menard W, Fay C (2006) Gender similarities and differences in 200 individuals with body dysmorphic disorder. Compr Psychiatry 47(2):77–87

73. Mazzeo SE (1999) Modification of an existing measure of body image preoccupation and its relationship to disordered eating in female college students. J Couns Psychol 46(1):42

74. Mitchison D, Crino R, Hay P (2013) The presence, predictive utility, and clinical significance of body dysmorphic symptoms in women with eating disorders. J Eat Disord 1:1–10

75. Hrabosky JI, Cash TF, Veale D, Neziroglu F, Soll EA, Garner DM, Strachan-Kinser M, Bakke B, Clauss LJ, Phillips KA (2009) Multidimensional body image comparisons among patients with eating disorders, body dysmorphic disorder, and clinical controls: a multisite study. Body Image 6(3):155–163

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