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Body functionality appreciation and body satisfaction in Indian young adults: The mediating role of cognitive fusion and the moderating role of emotion dysregulation

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Abstract

Recent research in positive body image has found positive associations between functionality appreciation and a positive body image but there is a lack of research on the mechanisms of this relationship, particularly within non-western populations. The current study explored a moderated mediation model for this relationship between functionality appreciation and body satisfaction which incorporated body image-related cognitive fusion as a mediator and emotional dysregulation as a moderator based on the Acceptance-Commitment Therapy framework and the Developmental Theory of Embodiment. 401 young Indian adults completed an online survey, and the data was analysed through simple mediation and moderated mediation analyses. Results showed that functionality appreciation was positively associated with body satisfaction. Body image-related cognitive fusion significantly mediated this relationship, but emotion dysregulation did not significantly moderate the direct or the indirect effects. The findings contribute evidence from a non-western context that body-image relative cognitive fusion as a key mechanism between functionality appreciation and that body satisfaction which could be considered for designing future interventions to improve positive body image.

Keywords: Body Functionality Appreciation; Body Satisfaction; Body Image-Related Cognitive Fusion; Emotional Dysregulation; Positive Body Image; Embodiment

1. Introduction

Perception and evaluations of the body affect not just appearances but also thoughts, emotions, and behaviours (1,2). It provides a frame to understanding how the body exists not just in physical space but also in sociocultural spaces (3). Body image influences self-worth to such an extent that it becomes tied to an individual's sense of self (2). It naturally leads to evaluations of the body which is crucial for mental health (4). Importantly, the literature connects body image disturbance to various negative psychological outcomes (5). An individual's wellbeing shifts depending on how they view of their body (5,6). For young adults, appearance pressures are intense as their identities are taking shape at a time when they still have not development a detachment from societal beauty standards (Cataldo et al., 2021; Gattario & Frisén, 2019; Tiggemann & McCourt, 2013).

Asian and western societies view the body in uniquely contrasting ways. Asians view the self interdependently, to be in social harmony, while western individuals value an independent self and internal states like autonomy (11). In fact, thin-ideal idealisation connects closely to body image struggles in the west (12,13). However, these idealisations have been studied to be spreading into non-western societies as well (Thompson et al., 2020;). India specifically has seen rising body dissatisfaction which points to the importation of western cultural standards of beauty. Both women and men in the country had significant body specific issues (15,16). This stems from media like local films and their actors, as well as peer and family pressure (17,18). It leads to unique body concerns among young Indians including that of

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skin colour (19), and body hair (20). This is further reinforced complicated by India's caste system that deepens this skin colour divide (19).

Positive body image covers the perceptions that spark deep appreciation for one's body (21). Conversely, persistent dissatisfaction with the body leads phenomena of negative body image (22). These two constructs are separate and distinct rather than being found on ends of a continuum (23).

Body functionality reflects a recent shift where we go from a solely appearance-based view of the body to an active system better defined by its capacities. This view emphasises what the body can do across a number of functional domains (24). The juncture where the capabilities incorporated emotionally and cognitively leads to functionality appreciation.

Functionality appreciation is related to improved body satisfaction (24,25). In clinical contexts with individuals facing eating disorders, interventions encouraging functionality appreciation has demonstrated effectiveness (26). They have also shown correlations with body appreciation (27).

Functionality can be viewed through the Developmental Theory of Embodiment (DTE) which positions it as a core embodiment dimension; the level of an individual's lived engagement with their body in the world (28). It includes engaging with the world in physically empowering ways through physical movement, verbal agency, or joyful non-objectifying activities. This can promote positive embodiment and a critical stance towards standards of beauty leading to a healthy connection with the self which subsequently leads to improves body satisfaction.

Within Acceptance-Commitment therapy (ACT), human suffering is understood as achieved through reduced psychological flexibility by targeting inflexibility through the hexaflex, six interdependent processes to create positive embodiment (29). One salient maladaptive process within ACT is called cognitive fusion. It captures the literal perception of thoughts that leads to the inflexible enmeshment with those same thoughts (30). For body image, this comes as "body image-related cognitive fusion" leading to strong identification with thoughts and feelings concerning physical appearance (31,32). Such fusion mediated associations between body image disturbance and outcomes like life quality (31). It further negatively contributes to body appreciation (33).

In contrast, functionality appreciation can promote a shift from an objectified view of the body to that of an active process (24,34). Psychological flexibility amongst breast cancer survivors was also affected by functionality appreciation (35). Functionality appreciation may help reduce the inflexible attachment to appearance-based thoughts.

Emotion regulation involves managing and modulating emotional responses to be consistent with individual goals (36,37). It allows the control of over not just the experience of emotions but also their expression. In contrast, emotional dysregulation is the inability to control and moderate one's emotional experiences such that they result in dysfunctional experiences (38). Emotional dysregulation can be viewed as a maladaptive responsiveness to internal states which interferes with adaptive responses. It is a transdiagnostic of various psychological outcomes (38), including body-related concerns (39–41). Prospective research also reveals difficulties in emotion regulation leads to reduced functionality appreciation (25). Furthermore, cognitive fusion can also disrupt effective emotion regulation by impairing emotion differentiation (42).

Body functionality appreciation is associated with more better body image outcomes (43), yet the mechanisms underlying this relationship remain underexplored (24). Cognitive fusion represents one potential pathway (35). Emotion regulation difficulties are also closely linked to body image disturbances (25) though these variables are rarely examined within an integrated framework. Additionally, most research predominantly rely on western, female samples which limits generalisability, and highlight the need for studies in more diverse and non-Western populations (13).

Research shows people's appreciation for their bodies are linked with increased functionality appreciation (43). However, there are still gaps in the examination of mechanisms through which such effects occur (24). One potential mediating mechanism is cognitive fusion (35). Additionally, body image disturbances often shows up alongside emotion regulation difficulties (25), but there are few, if any, studies integrating all these variables together. Further, existing literature relies predominantly on western female samples (13), which limits their generalisability towards diverse populations, highlight the need for further research amongst non-western and male contexts.

This study examines the relationship between body satisfaction and functionality appreciation within an integrated model. Specifically, it evaluates whether this primary relationship works through body image-related cognitive fusion,

while considering for emotional dysregulation in shaping these effects through a moderated mediation model (see Figure 1). Gender is often relevant in body image and so it was used as a covariate (12)

We hypothesised that functionality appreciation will lead to increased body satisfaction (H1). Further, cognitive fusion was expected to mediate this relationship, such that greater functionality appreciation will correspond to lower body image-related cognitive fusion, which subsequently lead to higher levels of satisfaction with the body (H2). Finally, it was hypothesised that emotional dysregulation will moderate this mediation such that the positive effects of functionality appreciation and reduced cognitive fusion on body satisfaction will be stronger among individuals with lower levels of emotion dysregulation (H3).

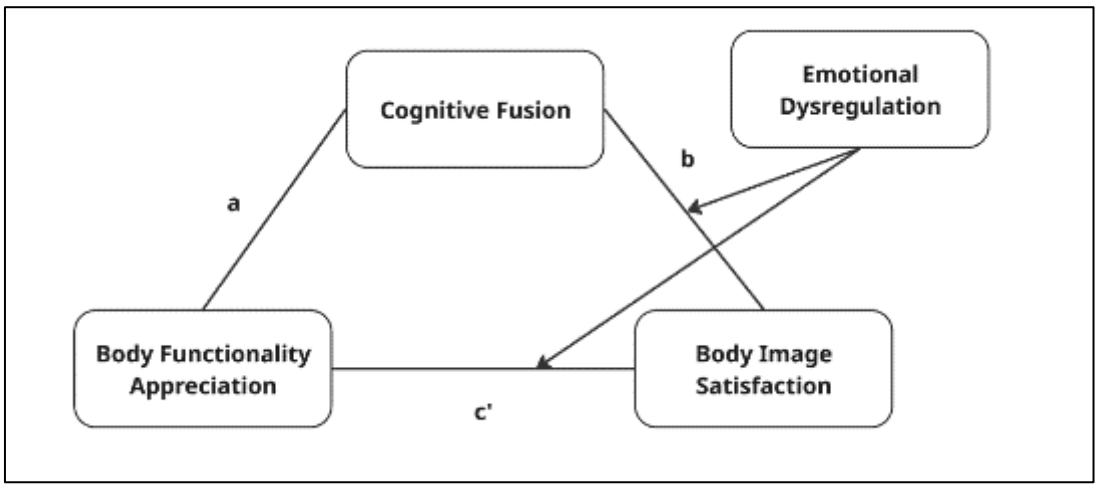

Figure 1 Model Diagram

2. Materials and Methods

2.1. Participants

We utilised a cross-sectional and correlational design. A priori power analysis conducted using G*Power 3.1 (44) indicated the need for at least 262 participants to detect a small-to-moderate interaction effect (f^2 = .05) with α = .05 and power of .95 in a regression model including four predictors. Participants were 401 young Indian adults aged 18-30 year who were recruited from across three universities in Bengaluru via convenience sampling. There were 177 men, 218 women, 4 non-binary individuals, and 2 preferring not to disclose their gender. For analyses with gender as a covariate, it was dummy coded (0 = male, 1 = female). Non-binary participants or those preferring not to disclose their gender (n=6) were treated as missing in specific analyses due to small subgroup size. The study was completely voluntary, all identities kept anonymous, and informed consent was obtained.

2.2. Measures

Functionality Appreciation Scale (FAS). It is a 7-item unidimensional measure designed to assess the extent of an individual's appreciation of their body's capabilities, regardless of physical limitations or appearance (45). Responses are indicated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). It showed strong internal consistency (α = .87 to .91 for women, .84 to .90 for men). Its Cronbach's coefficient was .94 in our study.

Body Appreciation Scale-2 (BAS-2). It is a 10-item self-report instrument assessing positive body image attitudes (46). Participants indicated agreement on a 5-point Likert Scale ranging from 1 (Never) to 5 (Always). It has been widely validated, displaying excellent internal consistency (α = .94 to .97 in women and α = .93 to .96 in men), and strong convergent validity with well-being indices. Here, it had a Cronbach's α coefficient of .96.

Cognitive Fusion Questionnaire – Body Image (CFQ-BI). This 10-item single-factor scale created by Ferreira et al. (47), measures the extent to which individuals become entangled with thoughts related to their body image. Items are recorded on a 7-point Likert scale ranging from 1 (Never True) to 7 (Always True). It showed excellent internal consistency (α = .96). Its Cronbach's coefficient was .94 in our study.

Difficulties in Emotion Regulation Scale – Short Form (DERS-SF) (48). It is a brief version of the original 36-item Difficulties in Emotion Regulation Scale (49). 18 items capture key dimensions of emotion dysregulation in a six-factor structure including nonacceptance, goals, impulse control, awareness, strategies, and clarity. Items are rated on a 1 (almost never) to 5 (almost always) Likert scale. Subscale scores are attained by adding relevant items, and a total score is calculated by adding all 18 items. Items within the Awareness and Clarity subscales are scored in reverse. It maintains high internal consistency (α **=** .91 in adolescents and .89 in a college sample). Its total score Cronbach's α coefficient for this study was .89. Subscale reliabilities were: Strategies (α = .82), Non-acceptance (α = .80), Impulse (α = .87), Goals (α = .85), Awareness (α = .79), and Clarity (α = .79).

2.3. Procedure

An online survey was administered between August to October 2025. Ethical approval was obtained from the institution prior. They were administered with the aforementioned measures, and relevant statistical analyses were done with SPSS (Version 27) following assumptions checks.

3. Results and Discussion

Table 1 Means, Standard Deviations, and Correlations Among Study Variables

Variable	M	SD	1	2	3	4	5
1. FAS	3.69	1.01	—				
2. CFQ-BI	35.82	15.57	−0.30**	—			
3. DERS-SF	2.85	0.75	−0.06	0.48**	—		
4. BAS-2	3.56	1.05	0.53**	−0.42**	−0.21**	—	
5. Gender	0.55	0.50	0.08	0.04	0.00	0.14**	—

Note. N = 395–401. Gender coded as 0 = male, 1 = female; *p<0.05; **p < .01. FAS = Functionality Appreciation; CFQ-BI = Cognitive Fusion related to Body Image; DERS-SF = Emotional Dysregulation; BAS-2 = Body Appreciation.

The sample comprised primarily young adult students (88% aged 18–22; 91.8% students), with a slight female majority (54.4%) and predominantly urban residence (70.6%). Functionality appreciation was positively associated with body satisfaction and negatively with cognitive fusion. Cognitive fusion negatively with body satisfaction and positively to emotional dysregulation Emotional dysregulation showed a small negative association with body satisfaction (Table 1). Gender was positively associated with only body satisfaction.

Table 2 Mediation Analysis Predicting Body Satisfaction (N = 395)

Predictor	b	SE(HC3)	t	p	95 % CI	
					Lower	Upper
Mediator Model: Body Image-Related Cognitive Fusion (R^2 = .092)						
Body Functionality Appreciation (BFA)	-4.66	0.79	-5.88	< .001	-6.22	-3.10
Gender	2.04	1.53	1.33	0.18	-0.97	5.04
Outcome Model: Body Satisfaction (R^2 = .364)						
Body Functionality Appreciation (Direct effect, c′)	0.45	0.06	8.01	< .001	0.34	0.57
Body Image-Related Cognitive Fusion	-0.02	0.004	-5.56	< .001	-0.03	-0.01
Gender	0.23	0.09	2.61	.01	0.06	0.40
Total Effect: Body Satisfaction (R^2 = .289)						
Body Functionality Appreciation (Total effect)	0.54	0.05	9.92	< .001	0.46	0.65
Gender	0.19	0.09	2.06	0.40	0.01	0.38
Indirect Effect on Body Satisfaction						

Body Image-Related Cognitive Fusion	0.09	0.02			0.06	0.14

Note. CI = Confidence Interval; Unstandardized coefficients are reported; HC3 heteroscedasticity-consistent standard errors were used; Gender coded as 0 = male, 1 = female; Indirect effects are based on 5,000 bias-corrected bootstrap samples.

Mediation analysis (Table 2) confirmed Hypotheses 1 and 2. Functionality appreciation showed a significant total effect (b = 0.55, t = 9.92, p < .001, 95% CI [.44, .65]) and direct effect (b = 0.45, t = 8.01, p < .001, 95% CI [.34, .57]) on body satisfaction, with the model explaining 28.9% variance, R^2 = .29, F(2, 392) = 70.25, p < .001. Functionality appreciation negatively associated with cognitive fusion (b = −4.66, t = −5.88, p < .001, 95% CI [−6.22, −3.10]), which in turn negatively related to body satisfaction (b = −0.019, t = −5.56, p < .001, 95% CI [−.03, −.01]). The significant indirect effect (b = 0.09, SE = 0.02, 95% CI [0.05, 0.14]) indicated that higher functionality appreciation was associated with lower cognitive fusion, and in turn to greater body satisfaction.

Table 3 Moderated Mediation Model Predicting Body Satisfaction (N= 395)

Variable	**B**	**SE**	**p**	**95 % CI**	
				LL	UL
CF(BI) (R^2 = .092)					
BFA	-4.66	.79	<.001	-6.0	-3.15
Gender	2.04	1.53	.18	-0.97	5.04
BS (R^2 = .369)					
BFA	.46	.06	<.001	0.35	0.57
CF(BI)	-.02	.004	<.001	-0.03	-0.04
ED	-.09	.07	.17	-0.23	0.04
BFA × ED	.03	.07	.771	-0.10	0.16
CF(BI) × ED	.003	.005	.50	-0.006	0.013
Gender	0.23	0.09	0.01	3.29	3.57

Note. CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit; CF(BI) = Body Image-Relative Cognitive Fusion; BFA = Body Functionality Appreciation; BS = Body Satisfaction; ED = Emotional Dysregulation; Unstandardized coefficients reported. HC3 robust standard errors used. Bootstrap = 5000 samples. Variables mean-centered prior to analysis

Table 4 Conditional Indirect Effect of Body Functionality Appreciation on Body Satisfaction via Body Image-Related Cognitive Fusion

Emotional Dysregulation (Moderator)	**Effect**	**SE**	**95% CI LL**	**95% CI UL**
Low (-1 SD)	0.093	0.028	0.045	0.159
Mean	0.082	0.022	0.044	0.132
High (+1 SD)	0.069	0.027	0.022	0.129

Moderated mediation analysis (Tables 3-4) indicated that functionality appreciation negatively predicted cognitive fusion (b = −4.66, SE = 0.79, p < .001), but positively predicted body satisfaction (b = 0.46, SE = 0.06, p < .001), while cognitive fusion was negatively associated with body satisfaction (b = −0.02, SE = 0.004, p < .001). Indirect effect of functionality appreciation on body satisfaction via cognitive fusion was significant, with bootstrap confidence intervals excluding zero across levels of emotional dysregulation. However, emotional dysregulation did not moderate either the direct effect (b = 0.03, p = .636) or the mediator pathway (b = 0.003, p = .504), and the index of moderated mediation was non-significant (b = −0.015, SE = 0.02, 95% CI [−0.059, 0.028]). Thus, Hypothesis 3 was not supported.

4. Discussion

Our study investigated the mechanisms linking body functionality appreciation to body satisfaction in young adults, focusing on cognitive fusion as a mediator and emotional dysregulation as a moderator. Supporting Hypothesis 1,

functionality appreciation positively predicted body satisfaction, explaining 28.6% of the variance. Cognitive fusion partially mediated this, relationship, supporting Hypothesis 2 whereas emotional dysregulation did not moderate either the direct or indirect pathways, leading to Hypothesis 3's rejection. These findings suggest that valuing what the body can do may reduce rigid attachment to negative body-related thoughts, thereby enhancing body satisfaction, with this process remaining consistent across levels of emotional dysregulation.

Functionality appreciation goes hand in hand with body satisfaction. Instead of just lacking dissatisfaction, body satisfaction includes positive attitudes like appreciation for the body and respect for its functioning (24,39). The finding corroborates prior experimental research showing that focusing on functionality through interventions like the Expand Your Horizon program significantly improves satisfaction with one's appearance (50). It also corresponds with the DTE's conception of an engaged body resisting harmful sociocultural appearance pressures(24,51). Such a shift also brings values-consistent lived capability within ACT (29). This represents a fundamental evaluative shift from 'form to function' because functionality appreciation anchors the self in embodied capability.

The support for body image-related cognitive fusion for partial mediation provides critical insight into how functionality appreciation operates. It is consistent with previous research into body image-related cognitive fusion as a mediator in body image related outcomes (33,52,53). People who are users of fitness social media were able to avail its motivational benefits while filtering out maladaptive influences by adopting a detached use of such social media (54). Reduced fusion may also represent a form of mental freedom against mental corseting like the internalisation of restrictive discourses such as viewing the body as deficient which would weaken the internalisation of such objectifying discourses (51). By cultivating a sense of functionality, individuals can move to a more subjective view of the body and develop cognitive defusion. This also aligns with ACT model positing that human suffering is caused less by the content of unwanted thoughts and more by the processes one uses to handle them (31,41).

Interestingly, we found that emotional dysregulation did not moderate the model which goes against our hypothesis 3. This suggests a stability in the earlier mediation pathway. While emotional dysregulation is an established transdiagnostic vulnerability to psychopathology (55), it appears to not be able to alter the structural mechanism of this specific body image model. This stability implies that the benefits of focusing on "function over form" are accessible to young adults regardless of their trait-level ability to regulate intense emotions. This may be because functionality appreciation acts as a foundational protective filter, providing a sensing and experiencing-based relationship with the body that remains effective even when an individual's top-down regulatory systems are taxed (24,50). Thus, while emotional dysregulation may correlate with higher overall levels of distress (38), it does not prevent the adaptive anchoring effect that comes from honouring the body's capabilities (26,56).

The cognitive fusion may itself be a form of emotional dysregulation (47,52). This could lead to some of the variance being absorbed by cognitive fusion when paired with a general measure like the DERS. Furthermore, the shared variance is could also be captured by stronger cognitive constructs like self-image (57). As stated by Messer et al. (58), emotion dysregulation could be more situational based rather than a stable long-term predictor like one our model may otherwise suggest.

The findings extend ACT to positive body image by suggesting that functionality appreciation may promote psychological flexibility through reduced fusion with appearance-based thoughts, thereby facilitating more adaptive body evaluations. This also aligns with the DTE, which emphasises that positive embodiment emerges from agentic, lived engagement with the body rather than appearance-based evaluation (51). The mediating role of cognitive fusion indicates that functionality-based engagement may enhance body image partly by reducing over-identification with evaluative cognitions, reflecting a form of "mental freedom" from objectifying sociocultural standards.

Clinically, the results support a shift toward growth-oriented, mechanism-focused interventions in body image research, an area where such approaches remain limited (59). Interventions that enhance functionality appreciation, combined with ACT-based defusion techniques, may help individuals disengage from maladaptive body-related thoughts. Notably, the absence of moderation by emotional dysregulation suggests that this pathway operates relatively independently of global emotion regulation capacity, indicating potential applicability across a broad range of individuals, including those with elevated distress (39,60).

The cross-sectional design gives limitations to causal inferences. The reliance on self-report measures could also lead to shared method variance and social desirability, although anonymity was maintained to mitigate this. The use of convenience sampling, with a predominantly young, urban student sample, further limits generalizability to other populations. Additionally, the exclusion of non-binary participants from analyses due to their small subgroup size, limits the representation of diverse gender experiences.

Several additional potential mediators were also not examined which may carry the effects of functionality appreciation (24). The global score of the DERS-SF was used to understand emotional dysregulation's moderation, but this may mask the influence of specific regulatory processes (61). A more nuanced look into its specific subscales may give different results. This limits the interpretation of the results but does not invalidate the patterns observed in the data. The constructs examined in this study may also differ across cultural contexts (Martin & Latner, 2025).

5. Conclusion

Functionality appreciation predicts greater body satisfaction. This relationship was partially mediated through body image-related cognitive fusion, suggesting that valuing the body's capabilities helps individuals cultivate cognitive defusion, thereby creating psychological distance from rigid, appearance-based evaluations. Notably, the null moderation by emotional dysregulation indicates that this mechanism remains structurally stable regardless of an individual's trait-level regulatory capacity, positioning functionality-based thinking as a universally accessible 'protective filter'. These results advocate for the integration of ACT techniques like cognitive defusion with functionality-focused interventions to foster better relationship with the body among young adults.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Statement of ethical approval

This study was approved by the department, and informed consent was obtained from all participants included in the study.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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