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The Impact of Chest Binding in Transgender and Gender Diverse Youth and Young Adults

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ABSTRACT

Purpose: There is a sparsity of information on chest binding practices among transmasculine and gender diverse people regardless of age and even less information pertaining to adolescents and young adults (AYA). The purpose of this study was to understand binding trends in AYA and to recognize how chest binding impacts chest dysphoria and life satisfaction.

Methods: Data were collected from eligible participants via a national online survey. In this national, cross-sectional study, 684 surveys from AYA aged 13–24 years compared those who bind and those who do not bind.

Results: Most participants reported learning to bind online and were not connected to any type of gender care or community center. Participants in the binding cohort reported less “misgendering” than the nonbinding cohort, and there was a significant correlation between increased chest dysphoria and lower scores on life satisfaction.

Conclusions: This study provides insight into how AYA obtain information about binding and how binding impacts their life. It also indicates that transmasculine and gender diverse AYA will continue to bind their chest to benefit from the protective factors experienced with chest binding. This study also highlights the importance of improved education for medical providers as well as parents/guardians regarding binding to support those who experience chest dysphoria or discomfort.

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IMPLICATIONS AND CONTRIBUTION

This study examined chest binding among transmasculine and other gender diverse individuals and demonstrates the importance of this practice for improving life satisfaction and perceived safety, despite physical health sequelae resulting from binding. This study also reveals a paucity of resources available to adolescents and young adults regarding safe binding practices.

Conflicts of interest: The authors have no conflicts of interest to disclose.

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Gender dysphoria is defined as the psychological distress experienced by many transgender and gender diverse individuals, resulting from an incongruence between one's sex assigned at birth and one's gender identity [1]. Approximately 356,000 adolescents and young adults (AYA; aged 13–24 years) identify as transgender in the U.S. [2]. These numbers likely leave out individuals who do not identify with this umbrella term, those who do not feel safe disclosing their identity, or those who are not connected to gender-affirming services. It is common for individuals to experience gender dysphoria before they are able to name the discomfort they are experiencing.

Chest dysphoria is the distress or discomfort one feels because of chest tissue that has developed after undergoing an endogenous female puberty [3]. Dutton et al. [4] described that chest dysphoria was a primary cause of gender dysphoria for transmasculine and gender diverse (TMGD) individuals. Olson-Kennedy et al. [3] found that 40% of TMGD youth felt like their life had not started because of chest dysphoria. One strategy TMGD individuals may use to reduce the impact of chest dysphoria is to bind the chest. Chest binding is the act of compressing or wrapping the chest to achieve a flatter appearance [5]. Chest binding is a common practice within the TMGD community; however, there is a lack of research undertaken to understand the impact of this intervention, particularly among AYA.

In a 2019 study aimed at understanding the reasons behind chest binding, Lee et al. [6] reported that many motives were driving the desire to bind distinct from the desire to be perceived as male. Although being perceived as male may be one reason someone might bind their chest, it is typically not the sole reason for the practice. The study reported that individuals were binding to feel more authentic, minimize discomfort, and increase safety [6]. Authentic living includes being perceived correctly in regards to gender, as well as being comfortable with one's body. For nonbinary AYA not being perceived as female may be a critical aspect of authentic experience, although they might not identify as male. A 2018 study on minority stress and being misgendered found that those who experienced consistent misgendering had higher rates of psychological distress [7]. The literature on the impact of feeling uncomfortable and/or dysphoric with one's body is growing; however, the measures that individuals will take to help reduce that discomfort is mostly unknown.

Previous research on chest binding within the TMGD community has highlighted the negative health implications that may be experienced because of chest binding. Peitzmeier et al. [8] found a high prevalence of negative health effects because of binding. Despite these events, "participants consistently affirmed that the advantages of binding outweighed the negative physical effects". The only permanent solution to chest dysphoria is chest reconstruction surgery; however, not all those who experience chest dysphoria want surgery. Even for those desiring surgery, barriers such as age restrictions, financial limitations, unstable housing, lack of health insurance, and/or having an unsupportive family result in surgery being inaccessible to many.

Research has not fully explored why individuals continue to bind despite the potential health implications. Although there is a lack of published data, resources from within the TMGD community have identified and described chest binding as essential for the emotional well-being of TMGD individuals [9]. Understanding the potential positive impact of chest binding on the health and well-being of TMGD individuals is important, as methods to help reduce chest dysphoria and mitigate negative health outcomes are developed.

Finally, exploring how TMGD AYA gather information about the practice of chest binding may have significant implications for medical professionals working to improve the lives of their TMGD patients. A 2018 study found that 88.9% of participants had experienced a physical side effect from binding; however, only 14.8% had sought care with a medical provider [10]. In addition, the study looked at comfort level and communication patterns between TMGD adults and their medical providers and found that providers were not asking about chest binding practices. These findings suggest that the lack of inquiry about binding negatively impacts help seeking behaviors for those

experiencing a medical condition. The authors emphasized the importance of medical providers understanding binding practices to support healthy binding practices [10].

To the best knowledge of these authors, this is the first nationwide study to describe how TMGD AYA are learning about chest binding and the impact of chest binding on those experiencing chest dysphoria. In addition, this study compares and contrasts two AYA cohorts experiencing chest dysphoria—those who are binding their chest and those who are not. The secondary aim was to explore binding trends and deficits in information to inform best practices when working with AYA who have increased barriers to accessing care and fewer resources to help mitigate chest dysphoria.

Methods

Study design and eligibility

This cross-sectional, comparative study used remote data collection methods to reach a nationwide sample of AYA. Participants were eligible if they were aged 13–24 years, designated female at birth or intersex, had not had chest surgery, experienced chest dysphoria or discomfort, and were living in the U.S. or its territories at the time of survey completion. In addition, participants were required to be able to read and understand English. Two cohorts comprised of individuals who had some experience binding their chest and individuals who had never bound their chest were recruited. Given the lack of existing data, the sample size was estimated based on previous comparative studies.

Survey

After prescreening questions determined eligibility, survey questions included demographics, patterns and trends of chest binding, life satisfaction, and chest dysphoria. The Chest Dysphoria Scale and a subscale from the Gender Congruence and Life Satisfaction scale were used to assess chest distress and life satisfaction [3,11]. The Chest Dysphoria Scale is a nonvalidated scale that includes items related to physical functioning, including hygiene and exercise, intimate partnerships and dating, being perceived as a gender other than their gender of identity, and disruption of future plans. The results of tests for internal consistency in its initial use suggested high reliability. Items such as "I avoid bathing/showering in order to avoid seeing my chest" and "I avoid seeking medical care because of my chest" were scored using a Likert scale, ranging from 0 (never) to 3 (all the time). Possible chest dysphoria composite scores range from 0 to 51, with higher scores indicating greater distress [3]. The 7-item life satisfaction subscale of the Gender Congruence and Life Satisfaction scale queried participants about different domains of their life [11]. Life satisfaction scores were calculated by taking the mean score across all items, with possible scores ranging from 1 to 5, with higher scores indicating greater life satisfaction.

Study data were collected and managed using REDCap, an online Health Insurance Portability and Accountability Act-compliant platform, hosted by the University of Southern California and Children's Hospital Los Angeles (CHLA) [12]. No personal identifying information was collected to preserve confidentiality. Questions formulated to identify patterns in binding were developed based on clinical observations and input from community members with binding experience. The survey

was reviewed and accordingly adjusted based on recommendations from our community advisory board comprised of former CHLA patients. The community advisory board meets monthly to provide input about both the clinical services and research endeavors of the Center. Consent was provided electronically, and for minors, parental consent was waived. The study was approved by the CHLA Institutional Review Board.

Recruitment

A link to the online survey was distributed through social networks, social media, and community agencies. The research team targeted TMGD community influencers on social media with high followings to post and distribute the link to their networks. Influencers are considered those with high numbers of social media followers that can influence how widely information is distributed. Community partners were asked to disseminate the link via palm cards and listservs. After completion of the survey, participants were given the option to be entered into a raffle using a separate link for a \$10 electronic gift card incentive. To elicit an unbiased, diverse sample of TMGD youth and young adults, no active recruitment took place within the authors' practice site.

Analysis

Characteristics of the binding and nonbinding cohorts were summarized using descriptive statistics. Numeric variables were summarized as means and standard deviations. For categorical variables, the frequency and percentage were reported for each variable level. Student's *t* tests were performed to compare mean scores on the Chest Dysphoria Scale and the Life Satisfaction Scale. Correlation analysis was performed to study the association between chest dysphoria and life satisfaction. Multiple linear regression analysis was used to study the association between access to gender services and life satisfaction. All analyses were conducted using R software [13].

Results

The study included 684 individuals who completed the survey—608 individuals in the binding cohort and 76 individuals in the nonbinding cohort. The mean age was 16 years for both cohorts. The sample was comprised of individuals responding from 47 states and two U.S. territories, with a majority living in a suburban area (42.1%). Half ($n = 342$) of the cohort reported not being connected to any gender-related services—296 (48.7%) of the binding cohort and 46 (60.5%) of the nonbinding cohort (Table 1).

The binding cohort

More than half of the individuals, 343 (56%), reported that they had been binding for 1–4 years, 355 individuals (58%) reported that they bound their chest every day, and 372 individuals (61%) reported that they did so for 8–16 hours per day. When asked why they had not bound in the past, 288 individuals (47.4%) attributed this to unsupportive parents. Nearly all of the participants (95.7%) reported that they had learned how to bind online, and only 13 (2.7%) reported they had learned about the practice from a medical provider. Most of the participants, 594 (95.9%), reported that they had experienced physical impacts

Table 1
Demographic by cohorts

Characteristic	Binding	Nonbinding
	Mean \pm SD/n (%)	Mean \pm SD/n (%)
Total	608 (88.9)	76 (11.1)
Age (years)	16.49 \pm 2.69	15.89 \pm 2.89
Community		
Urban	219 (36.0)	29 (38.2)
Suburban	257 (42.3)	31 (40.8)
Rural	132 (21.7)	16 (21.1)
Gender services used		
Mental health	250 (41.1)	23 (30.3)
Medical care	150 (24.7)	12 (15.8)
Community center	79 (13.0)	13 (17.1)
Other	8 (1.3)	0 (.0)
None	296 (48.7)	46 (60.5)

SD = standard deviation.

because of binding, ranging from back pain to overheating. Of those experiencing negative physical effects, 554 (95%) responded that they continued to bind because they felt more comfortable in public spaces, and 95.4% because they felt it was important to have a masculine appearing chest. Well, more than half of the participants (63.7%) cited safety in public places as a reason to continue binding despite negative physical side effects. The vast majority, 548 (90%), reported that they would like to undergo chest surgery in the future (Table 2).

Although most participants reported using commercial binders for chest compression, many reported historically having used other items, including tape, bandages, plastic wrap, tarps, pantyhose, girdles, and other household items to compress their chest.

The nonbinding cohort

Nearly all participants in the nonbinding cohort (94.7%) reported they would like to bind, with 51 (67.1%) responding that the reason they were not binding was because of unsupportive parents. Other reasons reported for not binding were chest size too big, fear of impacting the ability to have surgery in the future, asthma, causing breast cancer, and others. Fifty-four participants (71.1%) reported they were interested in chest surgery in the future (Table 3).

Chest dysphoria and life satisfaction

Both cohorts had relatively high mean composite scores on the Chest Dysphoria Scale—29.0 for those who were binding and 26.3 for those who were not binding. The binding cohort scored significantly lower on the item related to being misgendered because of their chest compared with the nonbinding cohort ($z = -6.40$; $p < .001$). Life satisfaction scores were similar with a mean of 3.04 within the binding cohort and 2.89 within the nonbinding cohort; scores indicating that both cohorts were on average only “sometimes” or “rarely” satisfied with their life ($t(93.2) = -1.92$; $p = .058$; Table 4). Those who reported greater chest dysphoria reported lower life satisfaction ($r(682) = -.36$, 95% CI = $-.42, -.29$; $p < .001$; Figure 1).

Role of medical providers

Multiple linear regression analysis demonstrated a statistically significant, positive association between the number of

Table 2

Binding cohort (N = 608)

	n (%)
How long have you bound/flattened your chest (years)?	
1 year or less	194 (31.09)
1–4 years	343 (56.4)
4–7 years	63 (10.4)
7–10 years	7 (1.2)
10+ years	1 (.2)
How often do you currently bind/flatten your chest? (days per week)	
1 day/week	17 (2.8)
2–3 days	46 (7.6)
3–4 days	53 (8.7)
4–6 days	137 (22.5)
Everyday	355 (58.4)
How many hours do you currently bind/flatten your chest per day?	
2–4 hours	9 (1.5)
4–8 hours	136 (22.4)
8–16 hours	372 (61.2)
16–24 hours	91 (15.0)
Why were not/are not you using a binder? ^a	
Parents	288 (47.4)
Finances	190 (31.2)
Unable to get one	274 (45.1)
Concerned about physical impact	95 (15.6)
Other	46 (7.6)
How did you learn to bind/flatten your chest? ^a	
Online	582 (95.7)
Friends	227 (37.3)
Family	9 (1.5)
Medicalp	13 (2.1)
Other	28 (4.6)
Do you experience any physical impacts of binding/flattening your chest? ^a	
Back/chest pain	489 (80.4)
Rashes	102 (16.8)
Acne	274 (45.1)
Shortness of breath	411 (67.6)
Itching	202 (33.2)
Bad posture	363 (59.7)
Overheating	369 (60.7)
Other	36 (5.9)
None	25 (4.1)
What makes you continue to bind/flatten your chest even though you experience physical impacts? ^a	
More comfortable in public spaces	554 (95.0)
More confident	534 (91.6)
Clothes fit	317 (54.4)
Masculine appearing chest	556 (95.4)
Feel safer in public	371 (63.6)
Other	30 (5.1)
Are you interested in having chest reconstruction (top surgery)?	
Yes	548 (90.1)
No	4 (.7)
Not sure	56 (9.2)
What are the reasons that you do not want or are unsure about having chest surgery? ^a (n = 60)	
Parents	35 (58.3)
Finances	43 (71.1)
Housing problems	5 (8.3)
Uncertainty about future	45 (75.0)
Concerned about pain and recovery	27 (45.0)
Other	7 (11.7)

^a Participants were allowed to select more than one option.

gender services accessed and life satisfaction, with life satisfaction scores increasing by approximately .10 for each additional service accessed after adjusting for age, community, and binding status ($\beta = 0.10, SE(\beta) = 0.03, p < 0.001; R^2 = 0.05$).

Table 3

Nonbinding cohort (n = 76)

	n (%)
Would you like to bind your chest?	
Yes	72 (94.7)
No	4 (5.3)
What is preventing you from binding/flattening your chest? ^a	
Parents	51 (67.1)
Finances	34 (44.7)
Don't know where to get a binder	22 (28.9)
Concerned about physical impact	24 (31.6)
Other	14 (18.4)
Are you interested in having chest reconstruction (top surgery)?	
Yes	54 (71.1)
No	4 (5.3)
Not sure	18 (23.7)
What are the reasons that you do not want or are unsure about having chest surgery? ^a (n = 22)	
Parents	13 (59.1)
Finances	12 (54.5)
Housing problems	2 (9.1)
Uncertainty about future	17 (77.3)
Concerned pain and recovery	10 (45.5)
Other	2 (9.1)

^a Participants were allowed to select more than one option.

Discussion

There is limited knowledge about chest binding practices within the TMGD community and even less about AYA binding practices. The findings of this study suggest that those experiencing chest dysphoria are less satisfied with their lives and have sought mechanisms to help mitigate the negative impact of chest distress. These data support previous study findings that those experiencing chest dysphoria will endure physical discomfort to lessen the emotional distress related to chest dysphoria [8,10]. Although both cohorts scored relatively high on the composite Chest Dysphoria Scale, there was a significant difference in mean scores. This variance can be attributed to greater chest dysphoria, translating to greater motivation to bind the chest. Pertaining to the item related to being misgendered, those who were binding their chest scored lower than those who were not binding their chest. Previous literature has addressed the negative impact of being misgendered on individuals' mental health; however, this is the first study to connect the impact of chest binding, specifically on misgendering [7]. Although there were many reasons identified for the practice of binding, being perceived accurately in one's gender remains important for the health and well-being of TMGD AYA and continues to take priority over the physical discomfort of binding for the majority of the binding cohort.

This study demonstrates that higher levels of chest dysphoria were connected to lower life satisfaction. This finding corroborates previous research indicating that many youth felt like their life had not started yet because of their chest dysphoria [3]. Note

Table 4

Life satisfaction and chest dysphoria

	Binding cohort (mean ± SD)	Nonbinding cohort (mean ± SD)	t(df); p-value
Chest dysphoria	29.0 ± 7.8	26.3 ± 9.8	t(87.2) = -2.28; p = .025
Life satisfaction	3.04 ± .62	2.89 ± .64	t(93.2) = -1.92; p = .058

SD = standard deviation.

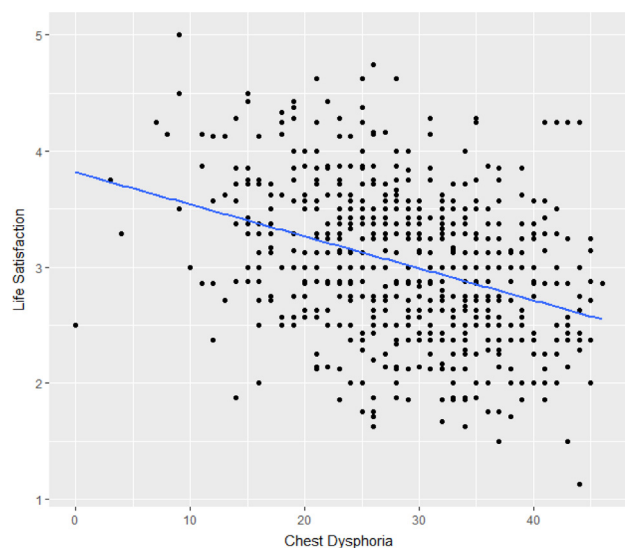


Figure 1. Scatterplot and linear regression line of chest dysphoria versus life satisfaction.

that the presence of chest dysphoria/discomfort was an inclusion criterion for participation in this study, so additional data from TMGD AYA with little or no chest dysphoria would help to further explore this relationship. Although reported life satisfaction in this study was not higher among those who were binding compared with those who were not, it was significantly higher among those who had accessed more gender services. These findings are aligned with outcomes found in the development and validation of the Gender Congruence and Life Satisfaction Scale in which participants who had received no gender-affirming services had low life satisfaction scores as well [11].

This study provides evidence that most TMGD AYA are learning about binding practices from online communities comprised of their peers and that some of the information may be misleading and potentially harmful. TMGD youth who were choosing not to bind despite experiencing chest dysphoria reported various reasons, including a perceived risk of breast cancer and potential negative impact on future chest surgery. With the majority of this cohort wanting to bind and desiring chest surgery, there is an apparent deficit in dissemination and acquisition of accurate information regarding chest binding and a potential positive role for medical professionals coming into contact with gender dysphoric AYA patients/clients.

Implications for parents and caregivers of TMGD AYA

Among the nonbinding cohort, more than half indicated their “parent” was a barrier to binding their chest. This was consistent with the binding cohort, most of whom identified a parent as a primary barrier to binding in the past. These findings underscore the need for parents and caregivers to receive accurate psychoeducation on chest binding to support their youth in accessing safe chest binding resources. Finally, this study demonstrates the resourcefulness of youth who do not have access to commercial grade binders. Commercial grade binders are almost exclusively found online, creating a barrier to access for those who lack finances and/or parental support. Participants reported using

items they could find at their homes to mitigate the distress they were experiencing (e.g., tarps, pantyhose, girdles, etc.). The unique and potentially harmful nature of these items supports the argument that medical providers should be asking more questions when patients endorse chest dysphoria or discomfort. The authors recommend that medical providers learn how to size and fit a patient for a binder, advocate for insurance companies to provide coverage for this medical device, and work with trans-affirming binder companies to provide in-clinic binders.

This study acknowledges that TMGD individuals experience varying degrees of distress related to their chest. For some, chest binding is a temporary strategy to use until surgery can be obtained. For others, chest binding is a lifelong process to achieve a greater level of comfort in their body despite the possibility of experiencing negative physical outcomes. The authors hope that improved psychoeducation of medical and mental health providers as well as parents and caregivers may increase the access to this reversible intervention for TMGD AYA.

Limitations

To maintain institutional review board waiver of parental consent, all questions related to the mental health implications of chest binding were omitted. It is probable that other domains of mental health beyond life satisfaction are impacted by chest binding. These investigators prioritized reaching youth unable to secure parental consent over the need to capture more comprehensive data around mental health for this pilot study. The survey was only available in English, and future studies should incorporate translation into other languages, such as Spanish. Another limitation to the study was that participants needed to have access to the Internet and be connected to some form of social media or agency to receive the link. These investigators wanted to ensure that survey materials and screening would be entirely online to capture as many AYA as possible across the country. This limited the study from capturing more youth from rural communities as well as those with very limited resources. Future studies should assess binding practices in AYA in rural areas and the best methods for outreach.

Conclusion

Chest binding is an important intervention for TMGD AYA experiencing chest dysphoria. TMGD AYA are binding or contemplating binding in spite of potential negative physical health repercussions, lack of support from medical providers, parents, and other barriers to safe binding practices. Most youth in this study reported binding every day more than 8 hours to provide protection against being misgendered and achieve psychological comfort, underscoring the importance of this practice. When young people are not given appropriate information about binding practices, they are left to find resources that may not be safe and inhibit help seeking behaviors. Future studies should assess the specific mental health benefits that can be achieved from chest binding. Future research endeavors that continue examining the effects of chest binding will help fill the gap of knowledge around the impact of binding and the effect on long term health outcomes. The lack of longitudinal research on binding and ways to limit negative health effects inhibits providers ability to prevent these outcomes; however, these conversations are essential to

provide the safest way to minimize chest dysphoria/discomfort. Providers should offer a personalized plan that centers not only physical health but also overall well-being of young people with chest dysphoria.

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