



Contents lists available at ScienceDirect

Journal of Pediatric Nursing

journal homepage: www.pediatricnursing.org

Pediatric surgery and school nurse attitudes regarding children with obesity



Nancy Thompson^a, Elizabeth L. Adams^b, Nancy Tkacz Browne^{c,1}, Melanie K. Bean^{b,*}

^a Department of Pediatrics, Children's Hospital of Richmond at Virginia Commonwealth University, Box 980015, Richmond, VA 23298, USA

^b Department of Pediatrics, Children's Hospital of Richmond at Virginia Commonwealth University, 2303 N. Parham Rd, Suite 1, Richmond, VA 23229, USA

^c Northern Light Health, Eastern Maine Medical Center, Department of Pediatrics, WOW Pediatric & Adolescent Weight & Cardiometabolic Clinic, 133 Corporate Dr., Bangor, ME 04401, USA

ARTICLE INFO

Article history:

Received 20 August 2020

Revised 13 January 2021

Accepted 14 January 2021

Available online xxxxx

Keywords:

Obesity

Weight bias

Discrimination

Weight stigma

ABSTRACT

Purpose: Weight bias towards individuals with obesity exists among medical professionals; yet, there is less evidence of the extent to which weight biases exist in different types of nursing professions. This study aimed to describe pediatric surgery and school nurses' weight biases towards children with obesity and examine factors associated with weight biases.

Design and methods: Pediatric surgery (n = 108) and school nurses (n = 177) completed a single online survey that assessed their attitudes towards weight regarding children with obesity. Responses were categorized as % agreement (responded "agree" or "strongly agree" to a given statement). Nurses also reported % time spent working with children who had obesity.

Results: Almost all nurses (>93%) agreed it was important to treat patients with obesity with compassion and respect. However, many nurses endorsed statements stating that patients with obesity are often non-compliant with treatment recommendations (47%) and can be difficult to deal with (35%). Only about half of school nurses (53%) and surgical nurses (56%) felt professionally prepared to effectively treat patients with obesity. Nurses commonly reported hearing/witnessing other professionals in their field make negative comments (69%) or convey negative stereotypes (55%) about patients with obesity. School nurses who spent a greater % of time working with children with overweight had more positive weight attitudes (p = 0.04).

Conclusions: Negative attitudes towards patients with obesity were relatively prevalent in this population of pediatric surgery and school nurses.

Practice implications: There is a need for more educational opportunities, professional trainings, and policy initiatives to reduce weight bias among nurses.

© 2021 Elsevier Inc. All rights reserved.

Introduction

Weight bias includes negative attitudes and beliefs towards others because of their weight and leads to harmful physical and emotional consequences (Andreyeva et al., 2008; Puhl & Latner, 2007). Children with overweight and obesity, defined as body mass index (BMI) ≥ 85 th but < 95 th percentile, and BMI ≥ 95 th percentile, respectively on BMI-for-age growth charts (Center for Disease Control and Prevention, 2018), are more likely to experience weight bias compared to their normal-weight peers (Puhl & Latner, 2007). This form of discrimination contributes to false stereotypes and unhealthy eating behaviors, and also impedes weight loss efforts (Puhl & Suh, 2015). Weight bias in

children is often displayed through teasing, bullying, and victimization (e.g., being ignored or excluded; Hayden-Wade et al., 2005; Lumeng et al., 2010; Puhl et al., 2011), and is one of the most common forms of discrimination reported by youth (Bucchianeri et al., 2016).

Current research in children has primarily focused on peers and family members as sources of weight bias (Puhl et al., 2020), with relatively less known related to weight bias among medical professionals. Research conducted in the medical setting often involves physicians, rather than nurses, and demonstrates that weight biases influence how healthcare providers view patients, and in turn, how they provide care (Palad et al., 2019). Negative attitudes towards patients with obesity can result in less time spent with patients and misattributing other health problems to obesity resulting in patients reluctant to seek appropriate care (Palad et al., 2019). These concerning relations warrant further investigation within the nursing profession, particularly in pediatric populations given that children are particularly sensitive to how others perceive them (Littleton & Ollendick, 2003). Weight bias from medical professionals can lead to lower quality care, reduced treatment

* Corresponding author at: 2303 N. Parham Rd, Suite 1, Richmond, VA 23229, USA.

E-mail addresses: nancy.thompson@vcuhealth.org (N. Thompson), elizabeth.adams@vcuhealth.org (E.L. Adams), melanie.bean@vcuhealth.org (M.K. Bean).

¹ Current address for Nancy Tkacz Browne is 25 Andrews Avenue, Falmouth, ME, 04105 USA.

adherence, and provider mistrust (Palad et al., 2019). Therefore, a greater understanding of nurses' weight bias towards children with overweight and obesity is needed, to identify sources of weight discrimination and improve efforts to reduce its deleterious impact.

There is some limited evidence of weight bias among nurses; for example, prior studies have found that nurses can possess negative weight attitudes towards adult (Brown, 2006; Garcia et al., 2016) and pediatric patients (Puhl & Heuer, 2012), including misbeliefs that individuals with obesity are lazy, noncompliant, and lack willpower (Puhl & Heuer, 2012). Further research is needed to build upon these findings and specifically examine weight biases among different specialties of nurses who treat pediatric patients. It remains unknown how pediatric surgery nurses in the medical setting and school nurses in the community setting view children with overweight and obesity. Pediatric surgery and school nurses both interact with children daily and can provide important obesity-related care in the form of assessing risk factors, providing referrals, promoting lifestyle changes, and disseminating healthy messaging (National Association for School Nurses, 2018; Rabbitt & Coyne, 2012); however, the extent to which these nursing specialties interact with children regarding weight-related issues differs. Thus, weight biases among surgery versus school nurses may also vary based on factors such as setting, professional training, and the type and extent of interactions with children who have obesity. Identifying weight biases in both the medical and community settings, among pediatric surgery and school nurses, respectively, is crucial to identifying these differences and developing targeted strategies regarding where improvements in care are needed.

Weight bias towards adult patients with overweight and obesity has been shown to vary by nurses' own weight status (Brown, 2006). Nurses who have overweight themselves tend to have a stronger weight bias compared with nurses with normal weight (Young & Powell, 1985) and those with a higher body mass index tend to rate obesity as less preventable (Hoppe & Ogden, 1997). Furthermore, nurses who are dissatisfied with their own body image tend to have more negative views about patients with obesity (Bagley et al., 1989). To build on this work, it is important to gather more current evidence on nurses' own weight status and their perceptions of patients with obesity, particularly given how much the awareness on weight biases has increased in recent years. It is also unknown if these same patterns exist in pediatric populations. Another factor associated with weight bias may be nurses' time spent working with children who have overweight and obesity. Positive contact among patients with obesity has been shown to reduce implicit weight bias and increase empathy (Dovidio et al., 2003; Phelan et al., 2015); therefore, pediatric nurses who spend more time working with children with overweight and obesity might have less weight bias. It is important to examine these and other factors that might be associated with weight biases among pediatric nurses in healthcare and school settings, to inform learning tools and trainings that empower nurses to interact more effectively and compassionately with children with overweight and obesity.

This study aimed to describe pediatric surgery nurses' and school nurses' weight bias towards children with overweight or obesity. Factors associated with positive and negative weight attitudes towards children with overweight and obesity were explored, including if nurses were engaging in their own weight loss efforts and time spent working with children with overweight.

Methods

Study design and participants

Pediatric surgery nurses completed a single online survey via RED-Cap that assessed their attitudes around weight towards children with overweight and obesity. School nurses completed a paper version of the same survey. Recruitment of pediatric surgery nurses occurred among American Pediatric Surgical Nurses Association (APSNA)

members, with targeted recruitment during the 2016 APSNA 25th Annual Scientific Meeting in San Diego, California. All APSNA members ($n = 600$) received an email with the survey link, and APSNA conference attendees ($n = 197$) also received information on how to complete the survey in their registration packet. The study was further promoted through electronic recruitment images displayed on television screens throughout the conference. Pediatric surgery nurses had to be members of the APSNA and >18 years of age to participate. A total of $n = 108$ nurses completed the survey, indicating a 18% response rate among all nurses who were emailed the survey link. Recruitment of school nurses was conducted at the 2016 Annual State of Virginia School Nurse's Conference in Richmond, Virginia. Potential participants ($n = 204$) were approached in person during the conference and provided paper copies of the survey. School nurses had to be working in the state of Virginia and >18 years of age to participate. A total of $n = 177$ nurses completed the study, indicating an 87% response rate. An information letter describing the study was presented at the start of the survey, and informed consent was obtained electronically for pediatric surgery nurses and on paper for school nurses before completing the survey. All study procedures were approved by the Virginia Commonwealth University Institutional Review Board.

Measures

Attitudes about treating patients with obesity

The Attitudes of Health Care Providers about Treating Patients with Obesity scale, developed by Puhl and colleagues (Puhl, Latner, et al., 2014; Puhl, Luedicke, et al., 2014), was used to assess weight bias attitudes. This 22-item questionnaire has demonstrated good reliability (Cronbach's alpha >0.80 ; Puhl, Luedicke, et al., 2014) and includes three subscales that assess 1) positive attitudes about treating patients with obesity (4 items; e.g., "I feel that it is important to treat patients with obesity with compassion and respect"), 2) negative attitudes about treating patients with obesity (14 items; e.g., "Patients with obesity can be difficult to deal with"), and 3) perceptions of weight bias among other professionals (4 items; e.g., "I have heard/witnessed other professionals in my field make negative comments about patients with obesity"). Each item was rated on a 5-point Likert scale ranging 1 = "strongly disagree" to 5 = "strongly agree". Items within each subscale were averaged. Percent agreement (%) for each individual item was also calculated by summing the frequency of "agree" and "strongly agree" responses for that item, consistent with methods from previous studies that examined weight biases in health care professionals (Puhl, Luedicke, et al., 2014).

Demographics and job characteristics

Demographic questions included nurses' sex and age. Questions related to job characteristics included the total number of years working as a nurse in general, the number of years working as a pediatric surgery or school nurse specifically, professional license attainment (Registered Nurse, Nurse Practitioner, or Other), employment location (inpatient, outpatient, or both for surgery nurses; city or county for school nurses), and percent time spent working with children with overweight (response options in 10% increments). Nurses were also asked if they were trying to lose weight themselves (yes/no) and if an educational module regarding weight bias would be helpful in their practice (yes/no).

Statistical analysis

Separate analyses were conducted for each subsample of nurses. Mean and standard deviations were calculated for each subscale pertaining to weight bias attitudes among pediatric surgery and school nurse samples. Frequencies were used to calculate percent agreement for each questionnaire item. Pearson product-moment correlations were used to examine if time spent working with children with overweight (a ratio variable) was linearly associated with scores on the

positive attitudes, negative attitudes, and perceptions of weight bias among other professionals subscales. The strength of the association is reported as the Pearson correlation coefficient (r) when significant. Independent t -tests were used to examine if nurses engaging in their own weight loss (yes/no dichotomous variable) was associated with these three subscales. Results are reported as mean difference (95% confidence interval) when significant. Data were analyzed using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA), and significance was determined as $p < 0.05$.

Results

Demographic characteristics of pediatric surgery and school nurses are shown in Table 1. Most nurses were female and >35 years of age. About half of pediatric surgery nurses were registered nurses, while the other half were nurse practitioners; almost all of school nurses were registered nurses. There was variability in the number of years of experience working as a nurse, and as a pediatric surgery nurse or a school nurse specifically. Most pediatric surgery nurses (76.9%) and school nurses (82.7%) spent $\leq 50\%$ of their time working with children with overweight. Most nurses were also trying to lose weight themselves (59.3% of pediatric surgery nurses; 66.5% of school nurses), and ~80% of all nurses said that an educational module regarding weight bias would be helpful in their practice.

Attitudes about treating patients with obesity

Mean values for subscales reflecting positive and negative attitudes about treating patients with obesity and perceptions of weight bias among other professionals are shown in Table 2. Mean values were similar between pediatric surgery and school nurses for each subscale. Almost all nurses (>91%) agreed that it was important to treat patients with obesity with compassion and respect, while only about half (53–56%) felt professionally prepared to effectively treat patients with obesity. Common negative attitudes included endorsement that

Table 1
Demographic characteristics and job description of pediatric surgery nurses ($n = 108$) and school nurses ($n = 177$).

	Pediatric surgery nurses	School nurses
Female (%)	97.2	98.9
Age (%)		
18–34 years	18.5	8.0
35–54 years	49.1	56.3
55+ years	32.4	35.8
Professional license (%)		
Registered Nurse	46.3	91.0
Nurse Practitioner	51.9	1.7
Other	1.9	7.3
Years working as a nurse (%)		
0–10 years	19.1	18.2
11–20 years	24.8	23.3
21–30 years	26.7	23.9
30–40 years	29.5	34.7
Years working as pediatric surgery nurse (%)		
0–10 years	41.7	58.3
11–20 years	32.4	29.7
21–30 years	15.7	9.1
30–40 years	10.2	2.9
Employment location (%)		
Inpatient	35.2	n/a
Outpatient	14.8	n/a
Inpatient & Outpatient	50.0	n/a
City	n/a	26.6
County	n/a	73.5

patients with obesity were often non-compliant with treatment recommendations (47%) and can be difficult to deal with (35%). Many nurses heard/witnessed other professionals in their field make negative comments (69%) and have negative stereotypes (55%) about patients with obesity.

Factors associated with nurse's weight bias

Time spent working with children with overweight

For school nurses, the percentage of time spent working with children with overweight was associated with more positive attitudes regarding weight bias ($r = 0.16$; $p = 0.04$), with no association among pediatric surgery nurses ($p = 0.50$). There were no associations among time spent working with children with overweight and negative attitudes regarding weight bias or perceptions of weight bias among other professionals for school nurses and pediatric surgery nurses ($ps > 0.05$).

Nurses own weight loss

School nurses not trying to lose weight had greater positive attitudes about treating patients with obesity, compared to those trying to lose weight (mean difference [95% CI]: 0.20 [0.01–0.38]; $p = 0.04$). Similar patterns were observed for pediatric surgery nurses (0.24 [0.04–0.44]; $p = 0.02$). School nurses not trying to lose weight also had greater negative attitudes about treating patients with obesity, compared to those trying to lose weight (0.16 [0.00–0.32]; $p = 0.049$), while there was no association among pediatric surgery nurses ($p = 0.43$). There were no associations between pediatric surgery or school nurses trying to lose weight and their perceptions of weight bias among other professionals ($ps > 0.05$).

Discussion

This study quantified pediatric surgery and school nurses' attitudes towards treating patients with overweight and obesity. Data from these two nursing specialties provided viewpoints among nurses in both the medical and community settings, who have different professional experiences interacting with children related to weight-related issues. Findings demonstrate that nurses have existing weight biases and often perceive weight biases among other professionals in their field. On a positive note, almost all nurses felt that it is important to treat patients with obesity with compassion and respect, and few nurses reported that they disliked treating patients with obesity. There was also evidence to suggest that school nurses who spent more time working with children with overweight had more positive weight attitudes. Collectively, these data provide a benchmark for existing weight biases towards children with overweight and obesity among pediatric surgery and school nurses working in the medical and community settings.

About 25–40% of nurses in this study reported feeling frustrated with patients who have obesity, while ~40–50% of nurses felt that patients with obesity were often non-compliant to treatment recommendations. Previous studies have examined these same viewpoints among other medical professionals, including family physicians (Alberga et al., 2019), students in graduate health disciplines (Puhl, Latner, et al., 2014), and medical professionals (e.g., psychologists) who treat eating disorders (Puhl, Luedicke, et al., 2014). In comparison to family physicians (~30%; Alberga et al., 2019) and students in graduate health disciplines (36%; Puhl, Latner, et al., 2014) weight biases tended to be similar or lower than nurses, while the percentage of medical professionals who treat eating disorders and adopted these same viewpoints was consistently lower (11–17%; Puhl, Luedicke, et al., 2014). Collectively, these beliefs perpetuate the stereotype that patients with obesity are non-compliant and unwilling to follow treatment recommendations which can be harmful to helping patients reach desired health outcomes. Another harmful stereotype and conventional narrative is that obesity as an issue of personal responsibility and individuals with obesity lack

Table 2

Overall subscale scores (mean \pm SD) and % agreement for each item on a survey that assessed attitudes of health care providers about treating patients with obesity. Survey was completed in a sample of pediatric surgery nurses (n = 108) and school nurses (n = 177).

	Pediatric surgery nurses	School nurses
<i>Positive Attitudes about Treating Patients with Obesity</i>		
Subscale score (mean \pm SD)	3.9 \pm 0.5	3.9 \pm 0.6
I feel that it is important to treat patients with obesity with compassion and respect	95.4	93.1
I feel confident that I provide quality care to patients with obesity	85.2	82.5
I feel professionally prepared to effectively treat patients with obesity	56.1	53.1
Treating patients with obesity is professionally rewarding	40.2	45.1
<i>Perceptions of Weight Bias among Other Professionals</i>		
Subscale score (mean \pm SD)	3.4 \pm 0.8	3.1 \pm 0.8
I have heard/witnessed other professionals in my field make negative comments about patients with obesity	79.4	63.2
Other health providers in my field often have negative stereotypes towards patients with obesity	68.2	46.3
Health care providers feel uncomfortable when caring for patients with obesity	41.1	18.8
My colleagues tend to have negative attitudes towards patients with obesity	44.9	32.0
<i>Negative Attitudes about Treating Patients with Obesity</i>		
Subscale score (mean \pm SD)	2.4 \pm 0.5	2.4 \pm 0.5
I feel that patients with obesity are often non-compliant with treatment recommendations	38.0	52.3
Patients with obesity can be difficult to deal with	46.2	28.8
I often feel frustrated with patients who have obesity	38.3	25.4
I feel that patients with obesity lack motivation to make lifestyle changes	28.0	34.1
Treating a patient with obesity is more frustrating than treating a non-obese patient	23.2	15.3
Treating a patient with obesity is more stressful than treating a non-obese patient	25.2	11.4
I would rather treat a non-obese patient than a patient with obesity	21.0	6.2
Treating a patient with obesity is more emotionally draining than treating a non-obese patient	20.6	10.2
Patients with obesity tend to be lazy	10.3	8.0
I dislike treating patients with obesity	4.7	1.7
I feel disgust when treating a patient with obesity	2.8	1.7
I feel more irritated when I am treating a patient with obesity than a non-obese patient	7.4	4.6
It is difficult to feel empathy for a patient with obesity	5.6	5.7
Treating a patient with obesity repulses me	1.9	0.6

% agreement was quantified as the % of nurses who responded "agree" or "strongly agree" to each statement on a 5-point Likert scale. Survey items from Puhl R, et al. *Int J Eat Disord*. 2014;47:65–75.

will-power and self-discipline compared to individuals with normal weight (Rubino et al., 2020). Approximately 30% of nurses in this study agreed that patients with obesity lack motivation for making lifestyle changes, signifying that this belief was somewhat prominent. Previous studies have shown a similar percentage of students in health disciplines (33%; Puhl, Latner, et al., 2014) reported this same viewpoint, while a lower percentage of medical professionals who treat eating disorders (9%; Puhl, Luedicke, et al., 2014) also agree. Weight biases may differ across types of medical professionals for various reasons, including differences in professional trainings, the extent to which they work with individuals who have obesity, different lived experiences, and implicit weight biases. The relatively higher prevalence of harmful weight biases among nurses in this study signifies that greater efforts are needed to reduce weight biases in the nursing profession, including more education on the complex causes of obesity, opportunities for trainings on implicit weight biases, and policies around the use of patient-centered communication strategies such as motivational interviewing (Puhl et al., 2016).

Given the high prevalence of obesity among children in the US, (Skinner et al., 2018) pediatric surgery and school nurses interact with children with obesity daily; yet, only about half of nurses in this study reported that they felt professionally prepared to effectively treat patients with obesity. These findings align with research showing that school nurses express having insufficient training in childhood obesity and related lifestyle issues (Turner et al., 2016) and highlight the need for more obesity trainings in the nursing profession, both at the undergraduate and graduate levels, as well as throughout continuing education for working professionals. Widespread integration of resources to effectively treat obesity can provide nurses with strategies for obesity care and reduce weight biases by offering proactive approaches that foster positive interactions with all patients. For example, online trainings and toolkits are available from credible organizations, such as the Rudd Center for Food Policy & Obesity Health and the Obesity Action

Coalition, detailed elsewhere (Fruh et al., 2016), and can be integrated into professional development plans to empower nurses to more empathically interact with patients who have obesity. Furthermore, certifications on obesity treatment are available for nurse practitioners (Commission on Dietetic Registration, 2020) and physicians (American Board of Obesity Medicine, 2020) while various obesity-related advanced certificates are also available for nurses and nurse practitioners (American Association of Nurse Practitioners, 2018; American Academy of PAs, 2020; American Society for Metabolic and Bariatric Surgery. Certified Bariatric Nurse (CBN) Certification Examination, 2020; Obesity Medicine Association, 2020). These certifications/certificates should be considered for registered nurses and nurse practitioners to provide them with the skills needed to adequately address obesity within their practice scope. Lastly, healthcare facilities and schools are often inadequately equipped to treat patients with obesity; therefore, appropriate infrastructure (e.g., seating and exam room tables) is needed to support sensitive care for these youth (Rubino et al., 2020). With just under half of all nurses in this study reporting that it was professionally rewarding to treat patients with obesity, educational materials and training resources should also include tools to help nurses to feel more effective and impactful in their profession.

The majority of nurses reported hearing or witnessing other professionals in their field make negative comments about patients with obesity, and pediatric surgery nurses in particular also reported that other health providers often have negative weight stereotypes. This commonality of negative comments and stereotypes is problematic given that it creates a sense of normality and perpetuates weight bias being more socially acceptable than other forms of biases (Latner et al., 2008). To combat this, healthcare teams and school boards can create a zero-tolerance policy for use of offensive language on obesity (Phelan, Burgess, et al., 2015) while also promoting more considerate dialect, including the use of "people-first language" (i.e., "individuals with obesity" rather than "obese individuals"; Kyle & Puhl, 2014). Data from this study also

indicated that school nurses not trying to lose weight themselves had greater positive and negative attitudes about treating patients with obesity. This unclear relationship may be due to how respondents interpreted the survey questions and warrants further investigation regarding factors that might be driving these varied responses to better understand why positive and negative attitudes might coexist. Importantly, school nurses who spent more time treating individuals with overweight tended to have more positive weight attitudes. Research has shown that positive interactions among individuals with obesity can lead to less weight biases (Phelan, Burgess, et al., 2015); thus, nurses who work more frequently with children with obesity may adopt more empathic thinking and positive viewpoints. Capitalizing on this notion, training exercises that include strategies such as perspective-taking of stigmatized groups have been shown to increase empathy; yet, their effects on reducing weight biases have not been as promising (Alberga et al., 2016) and thus remains an area of further investigation.

It is also important to highlight positive findings from this study, including that almost all nurses felt it was important to treat patients with obesity with compassion and respect (>93%). Thus, most nurses also have positive weight attitudes towards children with obesity. Furthermore, <5% of nurses reported feeling disgusted, repulsed, or disliking treating patients with obesity, thus suggesting that harsh negative viewpoints are not widely adopted in this population.

Practice implications

The implications of these findings for nursing practice include the need for greater efforts to reduce weight bias. Such efforts include more educational opportunities (e.g., online trainings, certificates, certifications) that offer effective strategies to foster positive interactions and promote patient-centered communication among nurses and patients. These educational opportunities can be integrated within professional development plans and nursing school curriculums to empower nurses to interact more effectively and empathetically with children who have obesity. Furthermore, zero-tolerance policies should be developed for the use of offensive language, and the use of people-first language should be more widely enforced.

Limitations

The main strength of this study includes the identification weight biases in an understudied population of pediatric surgery and school nurses, thus providing viewpoints towards patients with obesity among nurses in both the school and clinical settings. By including these two different nursing specialties, these data provide unique viewpoints from surgery nurses, who more routinely interact with children regarding weight-related issues, as well as school nurses whose professional responsibilities likely include a broader range of child health issues. However, interpretation of these results should take into account the study limitations. Recruitment of pediatric surgery nurses mostly occurred at the APSNA 25th Annual Scientific Meeting and school nurses had to attend the Annual State of Virginia School Nurse's Conference to be eligible, thus limiting the generalizability of these findings. For example, it is unknown if these same viewpoints are consistent among school nurses who work outside the state of Virginia or among surgery and school nurses who did not attend these conferences. Data are observational and cross-sectional, which do not allow for causal or temporal inferences. Given the sensitive nature of this topic, nurses could have answered in a way that they felt was socially acceptable. All survey responses were kept anonymous to reduce social desirability response bias. Although the Attitudes of Health Care Providers about Treating Patients with Obesity scale has been previously used and has good reliability (Puhl, Latner, et al., 2014; Puhl, Luedicke, et al., 2014), its validity has not been tested. There were also different recruitment and survey methods for school nurses (approached in-person and asked to complete this survey on paper) and pediatric surgery nurses

(sent a link to complete this survey electronically), which likely contributed to the different response rates (18% for pediatric surgery nurses who were emailed the link; 87% for school nurses who were given the survey). Lastly, information on past trainings and education that nurses had received around obesity and weight biases were not collected. Future studies with larger, more representative samples of pediatric nurses across specialties, that also assess any prior trainings related to obesity and weight bias, are recommended.

Conclusion

Overall, this study demonstrates the existence of weight biases in two distinct nursing professions. Findings can be used to inform future trainings, educational initiatives, and policy changes to reduce weight bias in this population and lead to improved delivery of care for all children. Weight biases exist across many different settings and populations; identifying the extent to which weight biases occur among nurses can serve as a first step towards reducing these harmful viewpoints and providing more compassionate and empathic care.

Funding

This work was supported by the National Institutes of Health (2T32CA093423) for ELA postdoctoral effort, and a CTSA award (UL1TR002649) from the National Center for Advancing Translational Science awarded to Virginia Commonwealth University. These funding sources had no involvement in the conduct of this work.

Declaration of Competing Interest

None.

Acknowledgments

The authors would like to acknowledge Dr. Lauren Goodloe for her support in conducting this study, Dr. Rebecca Puhl for her willingness to provide her developed survey, and APSNA members and school nurses for their willingness to participate in this study.

References

- Alberga, A. S., Pickering, B. J., Alix Hayden, K., Ball, G. D., Edwards, A., Jelinski, S., ... Russell-Mayhew, S. (2016). Weight bias reduction in health professionals: A systematic review. *Clinical Obesity*, 6(3), 175–188. <https://doi.org/10.1111/cob.12147>.
- Alberga, A. S., Nutter, S., MacInnis, C., Ellard, J. H., & Russell-Mayhew, S. (2019). Examining weight bias among practicing Canadian family physicians. *Obesity Facts*, 12, 632–638.
- American Academy of PAs (2020). *Obesity management in primary care certificate program* <https://www.aapa.org/cme-central/primary-care-obesity-management-certificate-program/>. Accessed August 2020.
- American Association of Nurse Practitioners (2018). *Introductory certificate of obesity management in primary care (modules 1–7)*. <https://aanp.inreachce.com/Details/Information/b6cbae97-1a16-451b-a30e-a6d713bc52d1>.
- American Board of Obesity Medicine (2020). *Certifying physicians in the treatment of obesity* <https://www.abom.org>. Accessed August 2020.
- American Society for Metabolic & Bariatric Surgery. *Certified Bariatric Nurse (CBN) Certification Examination (2020)*. Candidate handbook. <https://asmb.org/app/uploads/2014/05/2020-CBN-Handbook.pdf> (Accessed August 2020).
- Andreyeva, T., Puhl, R. M., & Brownell, K. D. (2008). Changes in perceived weight discrimination among Americans, 1995–1996 through 2004–2006. *Obesity (Silver Spring)*, 16, 1129–1134.
- Bagley, C., Conklin, D., Isherwood, R., Pechiulis, D., & Watson, L. (1989). Attitudes of nurses toward obesity and obese patients. *Perceptual and Motor Skills*, 68, 954.
- Brown, I. (2006). Nurses' attitudes towards adult patients who are obese: Literature review. *Journal of Advanced Nursing*, 53, 221–232.
- Bucchianeri, M. M., Gower, A. L., McMorris, B. J., & Eisenberg, M. E. (2016). Youth experiences with multiple types of prejudice-based harassment. *Journal of Adolescence*, 51, 68–75.
- Center for Disease Control and Prevention (2018). *Defining childhood obesity*. <https://www.cdc.gov/obesity/childhood/defining.html> (Accessed December 10, 2020).
- Commission on Dietetic Registration (2020). *CDR's interdisciplinary obesity and weight management certification* <https://www.cdrnet.org/interdisciplinary>. Accessed August 2020.

- Dovidio, J. F., Gaertner, S. L., & Kawakami, K. (2003). Intergroup contact: The past, present, and future. *Group Processes & Intergroup Relations*, 6, 5–21.
- Fruh, S. M., Nadglowski, J., Hall, H. R., Davis, S. L., Crook, E. D., & Zlomke, K. (2016). Obesity stigma and bias. *Journal of Nursing Practice*, 12, 425–432.
- Garcia, J. T., Amankwah, E. K., & Hernandez, R. G. (2016). Assessment of weight bias among pediatric nurses and clinical support staff toward obese patients and their caregivers. *Journal of Pediatric Nursing*, 31, e244–e251.
- Hayden-Wade, H. A., Stein, R. I., Ghaderi, A., Saelens, B. E., Zabinski, M. F., & Wilfley, D. E. (2005). Prevalence, characteristics, and correlates of teasing experiences among overweight children vs. non-overweight peers. *Obesity Research*, 13, 1381–1392.
- Hoppe, R., & Ogden, J. (1997). Practice nurses' beliefs about obesity and weight related interventions in primary care. *International Journal of Obesity*, 21, 141–146.
- Kyle, T. K., & Puhl, R. M. (2014). Putting people first in obesity. *Obesity (Silver Spring)*, 22, 1211.
- Latner, J. D., O'Brien, K. S., Durso, L. E., Brinkman, L. A., & MacDonald, T. (2008). Weighing obesity stigma: The relative strength of different forms of bias. *International Journal of Obesity (London)*, 32, 1145–1152.
- Littleton, H., & Ollendick, T. (2003). Negative body image and disordered eating behavior in children and adolescents: What places youth at risk and how can these problems be prevented? *Clinical Child and Family Psychology Review*, 6, 51–66.
- Lumeng, J. C., Forest, P., Appugliese, D. P., Kaciroti, N., Corwyn, R. F., & Bradley, R. H. (2010). Weight status as a predictor of being bullied in third through sixth grades. *Pediatrics*, 125, e1301–e1307.
- National Association for School Nurses (2018). *Overweight and obesity in children and adolescents in schools – The role of the school nurse*. (Position Statement. Silver Spring, MD).
- Obesity Medicine Association (2020). *NP/PA certificate of advanced education* <https://obesitymedicine.org/cme/np-pa-certificate-obesity-medicine/>. Accessed August 2020.
- Palad, C. J., Yarlagadda, S., & Stanford, F. C. (2019). Weight stigma and its impact on paediatric care. *Current Opinion in Endocrinology, Diabetes, and Obesity*, 26, 19024.
- Phelan, S. M., Burgess, D. J., Yeazel, M. W., Hellerstedt, W. L., Griffin, J. M., & van Ryn, M. (2015). Impact of weight bias and stigma on quality of care and outcomes for patients with obesity. *Obesity Reviews*, 6, 319–326.
- Phelan, S. M., Puhl, R. M., Burke, S. E., Hardeman, R., Dovidio, J. F., Nelson, D. B., ... van Ryn, M. (2015). The mixed impact of medical school on medical students' implicit and explicit weight bias. *Medical Education*, 49(10), 983–992 <https://doi.org/10.1111/medu.12770>.
- Puhl, R. M., & Heuer, C. A. (2012). The stigma of obesity: A review and update. *Obesity*, 17, 941–964.
- Puhl, R. M., & Latner, J. D. (2007). Stigma, obesity, and the health of the nation's children. *Psychological Bulletin*, 133, 557–580.
- Puhl, R., & Suh, Y. (2015). Health consequences of weight stigma: Implications for obesity prevention and treatment. *Current Obesity Reports*, 4, 182–190.
- Puhl, R. M., Luedicke, J., & Heuer, C. (2011). Weight-based victimization toward overweight adolescents: Observations and reactions of peers. *Journal of School Health*, 81, 696–703.
- Puhl, R. M., Latner, J. D., King, K. M., & Luedicke, J. (2014). Weight bias among professionals treating eating disorders: Attitudes about treatment and perceived patient outcomes. *International Journal of Eating Disorders*, 47, 65–75.
- Puhl, R. M., Luedicke, J., & Grilo, C. M. (2014). Obesity bias in training: Attitudes, beliefs, and observations among advanced trainees in professional health disciplines. *Obesity*, 22, 1008–1015.
- Puhl, R. M., Phelan, S. M., Nadglowski, J., & Kyle, T. K. (2016). Overcoming weight bias in the management of patients with diabetes and obesity. *Clinical Diabetes*, 34, 44–50.
- Puhl, R. M., Himmelstein, M. S., & Pearl, R. L. (2020). Weight stigma as a psychological contributor to obesity. *American Psychologist Journal*, 75, 274–289.
- Rabbitt, A., & Coyne, I. (2012). Childhood obesity: Nurses' role in addressing the epidemic. *British Journal of Nursing*, 21, 731–735.
- Rubino, F., Puhl, R. M., Cummings, D. E., Eckel, R. H., Ryan, D. H., Mechanick, J. I., ... Dixon, J. B. (2020). Joint international consensus statement for ending stigma of obesity. *Nature Medicine*, 26(4), 485–497 <https://doi.org/10.1038/s41591-020-0803-x>.
- Skinner, A. C., Ravanbakht, S. N., Skelton, J. A., Perrin, E. M., & Armstrong, S. C. (2018). Prevalence of obesity and severe obesity in US children, 1999–2016. *Pediatrics*, 141(3), Article e20173459 <https://doi.org/10.1542/peds.2017-3459>.
- Turner, G. L., Owen, S., & Watson, P. M. (2016). Addressing childhood obesity at school entry: Qualitative experiences of school health professionals. *Journal of Child Health Care*, 20, 304–313.
- Young, L., & Powell, B. (1985). The effects of obesity on the clinical judgments of mental health professionals. *Journal of Health and Social Behavior*, 26, 233–246.