

Nutrition-related needs and considerations in the transgender and gender non-conforming (TGNC) population: Current gaps and future directions in research

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Abstract

Transgender and gender non-conforming (TGNC) individuals face significant health disparities despite growing visibility and awareness. Nutrition-related disparities are particularly concerning, with TGNC individuals experiencing higher rates of food insecurity, eating disorders, body dissatisfaction, and overweight or obesity. Gender-affirming hormone therapy (GAHT) and other medical interventions lead to significant physiological changes that can influence nutritional needs, as well as body composition and bone mineral density, yet existing daily energy estimation equations do not account for TGNC individuals or those undergoing GAHT. Perioperative nutrition is also vital, as gender-affirming surgeries increase metabolic demands and risk of muscle loss due to immobility and catabolism. Moreover, TGNC individuals report higher rates of food insecurity, with transgender men being particularly affected, largely due to economic disparities and systemic discrimination. Eating disorders are likely under reported in this population due to limited access to competent, inclusive care. Most research combines transgender and gender non-conforming individuals, limiting insight into subgroup differences. To improve health outcomes among TGNC individuals, there is a critical need for more inclusive, longitudinal research, particularly in the areas of nutrition, metabolism, and post-surgical care. Such research could inform the development of tailored interventions, enhance healthcare provider competence, and support the creation of clinical guidelines that address the specific health and nutrition needs of TGNC individuals. Ultimately, this would help reduce disparities and promote long-term well-being for TGNC individuals.

Key words: nutrition assessment, healthcare disparities, health inequities, transgender persons, nutrition requirements

Cite as

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Highlights

- Transgender and/or gender non-conforming (TGNC) individuals are underrepresented in research, and experience several significant health disparities due to lack of clinician knowledge and bias
- One such key gap in knowledge are nutrition-related needs and considerations for the TGNC population, such as changes in body composition, changes to basal metabolism and daily energy needs, changes to bone density, and increased risks for eating disorders and food insecurity
- Greater research and clinical exploration into these areas will allow for these gaps in knowledge and practice to be addressed, and to establish best practices when working with TGNC patients and populations

Introduction

Transgender and/or gender non-conforming (TGNC) individuals are those people whose gender identity does not conform from the sex that was assigned to them at birth. Within the USA, it is estimated that there are over 1 million adults identify as TGNC, with some estimates suggesting that the number could be closer to 1.4 million.^{1–3} Although awareness and visibility of TGNC individuals continue to improve, significant health disparities and inequities persist, placing an ongoing burden on members of the TGNC community. These disparities exist across a wide spectrum of health outcomes and risk factors, including refusal or denial of care, gaps in provider knowledge and competence related to TGNC health needs and culture, and higher rates of bias and stigma when interacting with healthcare providers.⁴ Despite having relatively similar levels of health insurance coverage compared to cisgender individuals (those whose gender identity aligns with their sex assigned at birth), TGNC individuals are still more likely to delay or avoid interactions with the healthcare system due to fears of stigma and bias.⁵ An area in which there is often a lack of awareness and competence is the unique food and nutrition needs and considerations for TGNC people. The literature shows that TGNC experience disproportionate levels of eating disorders, body dissatisfaction, food insecurity, overweight and obese weight status, and limited overall access to nutrition-related services.^{6,7} Additionally, significant gaps remain in understanding how gender-affirming hormone therapy (GAHT) impacts nutritional and metabolic needs, bone health, overall body composition, and perioperative nutrition support for individuals undergoing gender-affirming surgical interventions.

Objectives

The goal of this editorial is to synthesize and share findings and insights regarding what is shown in the current literature regarding these specific nutrition-related needs for supporting TGNC health and wellness, as well as identifying causes of nutrition and health-related disparities.

Furthermore, it is our goal to identify gaps in knowledge that can be used to inform and guide future research to reduce these disparities.

Impacts on body composition, bone density and daily energy requirements

Research and practice related to the healthcare needs and considerations of TGNC patients represent an ever-expanding and evolving field. One emerging area of study is the impact of hormone replacement therapy (HRT) on body composition, metabolism and daily nutritional needs.

Changes to skeletal muscle mass and adipose tissue

Research shows that patients undergoing testosterone therapy experience an increase in lean body mass and skeletal muscle mass, along with a decrease in adipose (fat) tissue. Conversely, those undergoing estrogen therapy (with or without antiandrogen agents) tend to experience a decrease in lean body and skeletal muscle mass, accompanied by an increase in adipose tissue.⁸ When beginning GAHT, efforts have been made to understand the extent to which skeletal muscle mass is altered. For those using masculinizing GAHT, lean skeletal muscle mass has been shown to increase by approx. 10% over the first year, as well as a decrease in fat mass by about 10%,^{9–13} and an increase in skeletal muscle mass of 19% over the course of 3 years of using GAHT.¹⁴ For those using feminizing GAHT, longitudinal cohort studies have shown that lean skeletal muscle mass has a moderate decrease in the first year of therapy of approx. 3–5%,^{9,11,13,15–18} with an accompanying increase in body fat mass of approx. 28%.¹¹ With these alterations in skeletal muscle mass and adipose tissue mass, there is also the potential for an increased risk for overweight and obese status. Based on national survey data of 2,700 LGBTQIA+ people, 65.9% of transgender men were overweight or obese, with transgender men being

the group most likely to be obese within the lesbian, gay, bisexual, transgender, and queer (LGBTQ) community.¹⁹ The increased rates of overweight and obesity among TGNC individuals may result not only from the physiological changes associated with GAHT, but also from the interaction of GAHT with minority stressors and barriers to healthcare access, both of which can further elevate the risk of developing overweight or obese weight status.²⁰

Changes to bone density

Sex hormones play several important roles within the body, including bone modeling and bone remodeling. In adults utilizing GAHT, the impact of this form of gender-affirming therapy on bone health and mineralization is more mixed and uncertain. Some studies have associated GAHT in transgender women with an increase in bone mineral density (BMD).²¹ However, several systematic reviews and meta-analyses have reported inconsistent findings, particularly regarding changes in bone mineral density in transgender women.^{22,23} Additionally, potential changes to BMD cannot be solely attributed to the physiologic impact of GAHT, as changes in lean muscle mass and adipose tissue levels (and associated total body weight), as well as any potential changes in physical activity levels that an individual may undergo, will also impact BMD levels. An additional important area to note is that there remains a gap in long-term research on fracture risk in older transgender adults, so the exact potential impact of GAHT on BMD, osteoporosis and fracture risk remains unknown.

Estimating energy requirements

When it comes to estimating energy requirements for individuals, healthcare professionals will often rely on standard equations such as Harris–Benedict, Mifflin–St Jeor, FAO/WHO/UNU, and Owen. These equations have recently been updated and have demonstrated greater accuracy compared to earlier versions.²⁴ A significant limitation of these equations, however, is that they are based on sex assigned at birth (i.e., Male Equation and Female Equation), making them potentially inadequate and less applicable for TGNC or intersex individuals, particularly those undergoing gender-affirming hormone therapy (GAHT) as part of their care. To date, there are no standard equations, or adjustments to current basal metabolic rate formulas, that are recommended for use in the TGNC or intersex communities. Therefore, until equations or formulas specifically recommended for TGNC individuals are developed, it is advisable to use calorie (kcal) estimations based on body weight (kg). Some research has suggested that daily energy needs can also be influenced by the length of time receiving GAHT. In a study by Frenser and Fischer,²⁵ it was noted that the body composition of transgender women and men after 1 year of GAHT was within the middle/mean equivalent ranges for cisgender women and men.

As a result, individuals undergoing GAHT could, after 1 year of therapy, be advised to follow energy intake recommendations that align more closely with the midpoint of the existing reference values for caloric needs established for cisgender women and men during this initial period.

Perioperative nutrition support

For those who seek out gender-affirming surgeries, there are significant considerations related to diet and nutrition to support and aid in the body's healing process, potential changes to digestion and absorption, and to prevent potential complications. Nutritional status is a powerful predictor of postoperative outcomes and receiving proper dietary support and education pre- and postoperatively is critical. It has been estimated that anywhere between 24% and 65% of surgical patients are malnourished or at risk for malnourishment.²⁶ During surgery, there is an upregulation of cortisol, glucagon and proinflammatory cytokines that stimulate catabolism (breakdown) of liver and muscle glycogen stores to meet the energy demands of wound healing.²⁷ This process interferes with insulin secretion, which can lead to an increase in blood glucose levels, which can last for several hours, days or even several weeks.²⁸ Additionally, there is an elevation in protein catabolism postoperatively. Protein synthesis is reduced due to increased levels of cortisol, which leads to an impairment in the availability of amino acids to be used for gluconeogenesis, wound healing, and immune functioning.²⁸ Coupled with immobility that may be experienced postoperatively (depending on the kind of surgical procedure(s) used), this can lead to a significant loss of muscle mass, which can begin in as little as 48-h of post-surgical inactivity.^{28,29}

Eating disorders and body dissatisfaction

Body dissatisfaction in TGNC individuals is complicated because body dissatisfaction can often be related to the difference between gender identity and sex assigned at birth. With gender-affirming care, however, body dissatisfaction and disordered eating behaviors appear to decrease. The actual rates of disordered eating and clinical diagnoses of eating disorders in this population are likely underreported, due to barriers such as limited access to care, avoidance of healthcare settings, discrimination, and a lack of competent providers. It is estimated that approx. 10% of transgender men and 8% of transgender women have been diagnosed with either anorexia nervosa or bulimia nervosa.³⁰ These figures reflect only confirmed and diagnosed cases; therefore, the actual prevalence of eating disorders and body dissatisfaction within the TGNC population is likely higher. Published research indicates that trans men report rates of binge eating and fasting as high as 35%.³¹ In a small sample of transgender women, dietary restraint was found to be common, reported by just

over 25% of participants, while binge eating and excessive exercise were reported at lower rates of 13% and 8%, respectively.³⁰ It is important to note that most of the currently available research focuses on youth and young adults, while significantly less data are available on older TGNC individuals. It is also important to note that much of the available research groups transgender and gender non-conforming individuals together, making it difficult to distinguish differences in disordered eating behaviors between these 2 populations.

Food insecurity

Within the larger LGBTQ population, individuals are more likely to experience food insecurity than heterosexual and cisgender individuals. Utilization of the Supplemental Nutrition Assistance Program (SNAP) is higher among LGBTQ individuals than non-LGBTQ individuals, further highlighting the reality of food insecurity among this population. However, TGNC individuals experience food insecurity at especially higher levels. Almost 28% of transgender adults report food insecurity,³² with approx. 65% of transgender men in particular experiencing food insecurity.³³ One potential contributing factor to the disproportionate rates of food insecurity among LGBTQ individuals is economic disadvantage, as this population experiences higher rates of poverty compared to the general population. A study using data from the Behavioral Risk Factor Surveillance System in the United States found that LGBTQ people experience poverty rates reaching over 21%, while heterosexual and cisgender people experience poverty at rates closer to 15%.³⁴ These poverty rates are especially high among transgender people and bisexual women, who have poverty rates over 29%.³⁴

Conclusion

Transgender and gender non-conforming individuals experience several health disparities rooted in social stigma, bias, lack of provider training and competence, and significant gaps within the published research. While gender affirming care utilizing hormone replacement therapy and surgical interventions have been shown to be safe, there is limited long-term data on how these procedures impact basal metabolic rate, overall daily energy needs, and macronutrient and micronutrient needs due to changes in body composition. Additionally, there remains inconsistencies in how gender-affirming care can impact bone mineral density and skeletal health over time, as well as how nutritional considerations such as calcium, vitamin D, protein, daily energy needs, as well as potential impacts on nutrient absorption, may play a potential role. Researchers working both with TGNC populations, as well as those in metabolic research, can play a significant role in addressing

these gaps in knowledge by developing prospective studies in TGNC who are beginning to utilize gender-affirming medical therapies and monitor changes in metabolism, nutrition status and nutrient needs over time. This kind of research could aid in the development of perioperative nutrition education, guidelines and support systems to reduce the risk for surgical complications and promote overall health and wellbeing. Additionally, most research on eating disorders and food security does not adequately include TGNC individuals. More purposeful research and sampling of this population may not only yield greater insight into the true burden of eating disorders and food insecurity within the TGNC population but also help to generate best practices in identifying and remedying these nutritional risk factors over time.

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