



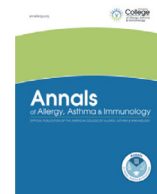
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## Editorial

## Lessons from the IMPAACT of coronavirus disease 2019 public health restrictions on food allergy-associated anxiety



Generalized anxiety disorder is among the most common mental health disorder and for which an instrument, the Generalized Anxiety Disorder 7-item scale (GAD-7), has been available to assess this condition for nearly 2 decades.<sup>1</sup> During the coronavirus disease 2019 (COVID-19) pandemic, symptoms associated with generalized anxiety disorder have broadly increased, albeit with a disproportionately higher risk among mothers, parents aged 18 to 44 years, those with household incomes less than \$100,000 Canadian, or those with certain preexisting mental health conditions, including anxiety.<sup>2</sup> In the early days of the COVID-19 pandemic, in a cohort of mothers of children aged 1.5 to 8 years, we reported that generalized anxiety was quantitatively higher among mothers of children with vs without food allergy.<sup>3</sup> Yet, in the same study, mothers managing food allergy qualitatively reported less food anxiety, when asked to compare their current experiences with those before the pandemic.<sup>3</sup> This observation underscores how generalized anxiety and food allergy-related anxiety are 2 distinct constructs. Consequently, excess generalized anxiety may broadly have adverse outcomes, including maladaptive coping. On the contrary, food allergy anxiety may, in fact, be adaptive and enhance risk management at moderate levels.<sup>4</sup>

Westwell-Roper et al<sup>5</sup> extended our mixed methods findings in a novel mixed methods study, following a convergent design. Canadian parents of children with food allergy were asked to quantitatively report both generalized anxiety, per the GAD-7,<sup>1</sup> and food allergy-specific anxiety, using a questionnaire developed by the authors, the Impairment Measure for Parental food Allergy-related Anxiety and Coping Tool, IMPAACT.<sup>6</sup> Parents were also asked to provide open-text responses about parenting a child with food allergy during this period. Data were collected by an online portal in May and June 2020, when COVID-19–related public health restrictions were in place across much of Canada.

Participants (almost exclusively mothers) in this study were well-educated, with most reporting post-secondary training or a post-graduate and, or a professional degree, and had annual household incomes more than \$100,000 CAD.<sup>5</sup> Most (85%) reported having only 1 child with food allergy, the most common of which was peanut, although many children had multiple food allergies. Participants perceived their children's allergies as severe; 70% had a history of anaphylaxis and 36% reported a history of asthma. During the study period, 67% of the participants reported increased generalized

anxiety during the COVID-19 pandemic. In contrast, 72% reported that food allergy anxiety remained unchanged or decreased, an observation that persisted even among those with increased generalized anxiety. This observation raises the possibility that, in the absence of instruments that estimate other types of anxiety, the GAD-7 is of limited utility in allergy populations. Moreover, the observation points toward disproportionately more anxiety surrounding food allergy is the result of social experiences outside the home, which in turn, underscores the importance of making food allergy a public health priority. As a result of the authors' wise inclusion of open-text responses, additional insights were gleaned about food allergy anxiety during the early days of the pandemic. These insights suggest that, consistent with the quantitative findings, some of the reduction in food allergy-specific anxiety may be partially explained by the fact that parents were afforded more control over potential allergy exposures as children were engaged in fewer social activities and were spending more time at home. Interestingly, although food allergy-specific anxiety remained unchanged or decreased for most parents during the early days of the pandemic, COVID-19 did introduce some novel concerns. Quantitatively, parents reported an increase in food allergy anxiety attributed to worries about finding allergy-friendly foods at the grocery store; this worry is likely, in part, attributable to widespread food procurement challenges during the early days of the COVID-19 pandemic.<sup>7</sup> Qualitatively, parents reported uncertainty about possible interactions between food allergy and COVID-19, pandemic-induced delays to allergist and emergency care, and feelings of isolation.<sup>5</sup> The findings point to a juxtaposition of perceptions: although participants reported some novel challenges, including feeling more isolated as a result of public health restrictions, the isolation they have experienced has enhanced control of what foods their children are eating.

As public health restrictions are increasingly lifted throughout much of Canada, and social interactions recommence, it is indeed this juxtaposition that must remain top of mind. To be sure, the findings of Westwell-Roper et al<sup>5</sup> and a careful consideration of how the resumption of social activities affects children can be used to create supportive environments that encourage families living with food allergy to manage generalized anxiety, while ensuring their food allergy anxiety is adaptive and facilitates risk management.

Of note, the study of Westwell-Roper et al<sup>5</sup> was based on data collected from a highly educated, high-income sample, but for which data on racial-ethnic identity were not collected. Going forward, emphasis must be given to greater diversity in sampling as income is a strong predictor of health care and medication access and ability to procure allergy-friendly foods.<sup>8</sup> Moreover, racial-ethnic identity affects health care access in ways only beginning to be understood.<sup>9</sup>

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and traditional gender norms may persist in food allergy,<sup>10</sup> a condition that mandates careful and timely preparation of food.

As a methodology, mixed methods involve assumptions that guide data collection, analysis, and interpretation.<sup>6</sup> The design used by Westwell-Roper et al,<sup>5</sup> with equal emphasis on quantitative and qualitative findings, is an elegant example of the power of mixed methods research. Findings from either method alone would have been interesting, but incomplete. The inclusion and, indeed, integration of the findings gleaned a deep and broad understanding of generalized and food allergy anxiety reported by Canadian parents during the early days of the COVID-19 pandemic and provides guidance as public health restrictions are relaxed and social activities begin again.

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## References

1. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder, the GAD-7. *Arch Intern Med.* 2006;166(10):1092–1097.
2. Hwang P, Ipekian L, Jaiswal N, Scott G, Amirali EL, Hechtman L. Family functioning and mental wellbeing impairment during initial quarantining for the COVID-19 pandemic: a study of Canadian families [e-pub ahead of print]. *Curr Psychol.* 2022. <https://doi.org/10.1007/s12144-021-02689-1>. accessed May 6, 2022.
3. Protudjer JLP, Golding MA, Salisbury MR, Abrams EM, Roos LE. High anxiety and health-related quality of life in families with children with food allergy during coronavirus disease 2019. *Ann Allergy Asthma Immunol.* 2021;128(1):83–88. e1.
4. Polloni L, Muraro A. Anxiety and food allergy: a review of the last two decades. *Clin Exp Allergy.* 2020;50(4):420–441.
5. Westwell-Roper C, To S, Soller L, Chan ES, Stewart SE. Decreased food-allergy-specific anxiety and increased general anxiety in parents of children with food allergies during COVID-19. *Ann Allergy Asthma Immunol.* 2022;129(2):242–246.
6. To S, Westwell-Roper C, Soller K, Stewart ES, Chan ES. Development of IMPAACT (Impairment Measure for Parental Food Allergy-Associated Anxiety and Coping Tool), a validated tool to screen for food allergy-associated parental anxiety. *Ann Allergy Asthma Immunol.* 2022. <https://doi.org/10.1016/j.anai.2022.02.020>. accessed May 6, 2022.
7. Nielsen DE, Labonté K, Karamanoglu I, Yang Han H, Tavanaei M, Duhamel P-G, et al. Longitudinal patterns of food procurement over the course of the COVID-19 pandemic: findings from a Canadian online household survey. *Front Public Health.* 2022;9: 752204.
8. Fong AT, Ahlstedt S, Golding MA, Protudjer JLP. The economic burden of food allergy: what we know and what we need to learn. *Curr Treat Options Allergy.* 2022:1–18.
9. Protudjer JLP, Greenhawt M, Abrams EM. Race and ethnicity and food allergy: remaining challenges. *J Allergy Clin Immunol Pract.* 2021;9(11):3859–3861.
10. Frykas TLM, Golding MA, Abrams EM, Simons E, Protudjer JLP. Mothers of children with food allergies report poorer perceived life status which may be explained by limited career choices. *Allergy Asthma Clin Immunol.* 2021;17(1):12.