



Distressed Families Demonstrate Resilience in the Context of COVID-19: Perspectives of Adolescents With Type 1 Diabetes and Their Mothers

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The psychosocial impact of the coronavirus disease 2019 (COVID-19) pandemic is relatively unknown in the general pediatric population, and particularly in families managing type 1 diabetes. Emerging evidence suggests that the pandemic and social distancing requirements are linked to increased parenting stress (1), worsening mental health in parents (2), and mixed effects for adolescent mental health (3,4). Both maternal depression and diabetes distress, the psychological burden and stress of caring for the complex daily demands of diabetes, are established risk factors for broad negative consequences in adolescents with type 1 diabetes, including worsening glycemic outcomes, problems with self-management, and poor quality of life (5,6). Because families already dealing with diabetes distress and/or depression may be more likely to struggle to adapt to a major stressor such as the COVID-19 pandemic, it is especially important to explore their responses to understand how best to support them (7). To our knowledge, this is the first multi-informant study to describe the reactions of adolescents and their mothers to COVID-19 and the perceived impact of the pandemic on diabetes management and adolescents' mood, as well as the coping strategies they used to deal with the stress of the pandemic.

Research Design and Methods

This study is an analysis of data from a COVID-19 survey added to an ongoing clinical trial evaluating the effects of a cognitive behavioral intervention for distressed mothers of adolescents with type 1 diabetes (ClinicalTrials.gov identifier NCT03818711). Mothers with elevated levels of depressive symptoms and/or diabetes distress were eligible to participate in the study, the details of which have been previously published (6). Data were collected from

active study participants (mother-adolescent dyads) between June and October 2020.

The survey included scales to assess the impact of COVID-19 on diabetes management (10 items, mother/adolescent $\alpha = 0.60/0.60$; e.g., "Struggled to properly manage my/my child's diabetes") and adolescents' mood (8 items for mother's report/10 items for adolescent's self-report $\alpha = 0.53/0.80$; e.g., "Experienced more variability in day-to-day mood than usual"). Additionally, we included an item about levels of worry/anxiety about COVID-19 (responses ranged from 1 = not at all to 5 = extremely) and an item about significant COVID-19-related life events (responses included loss of job or reduced hours, moving family home, change of health insurance, loss or change of child care providers, and planned change for schooling over the next year). Items from the impact and mood scales were summed (scores ranged from 10 to 50 for impact, 8 to 40 for parents' report of mood, and 10 to 50 for adolescents' report of mood, with higher scores indicating greater impact/poorer mood), and these scale scores were analyzed using bivariate correlations. We used descriptive analyses to assess adolescents' and parents' responses to the items regarding worry/anxiety and life events. The survey also included two open-ended questions: "In what ways has COVID-19 impacted your child's type 1 diabetes management?" and "What did you do to help yourself through the COVID-19 pandemic?" Responses to the open-ended questions were reviewed and coded by three members of the research team, and the coders discussed and reached consensus as needed. Author E.M.B. then analyzed coded responses to determine categories of codes and subsequent themes (8). A1C was retrieved from adolescents' medical records, when available, and if adolescents had telemedicine visits, they were sent mail-in A1C kits.

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Results

A total of 48 adolescents and 51 mothers completed the COVID-19 survey. The mean age of adolescent participants was 14.5 ± 2.1 years, 52% were female, 81% were non-Hispanic White, 62% used insulin pumps, 62% used continuous glucose monitoring (CGM), and their mean A1C was $9.0 \pm 2.1\%$ (75.0 ± 23.0 mmol/mol), which is representative of the clinic population. The mean age of mother participants was 40.4 ± 11.2 years, 82% were non-Hispanic White, 86% were married/partnered, and 67% had a college degree or higher, similar to the participants in the larger trial.

Scores for mothers' reports of the impact of COVID-19 on diabetes management ranged from 17 to 38 (mean 28.6 ± 5.4), whereas scores for adolescents' reports of the impact on diabetes management ranged from 14 to 38 (mean 26.8 ± 5.2). Scores of mothers' reports on the impact of COVID-19 on their children's mood ranged from 12 to 30 (mean 18.4 ± 4.4), and scores of adolescents' self-reports of mood ranged from 14 to 43 (mean 22.6 ± 7.7). Among mothers, 29% reported feeling very or extremely worried/anxious about COVID-19, compared with 12% of adolescent girls, who reported feeling very anxious (none reported extreme COVID-19-related anxiety), and 0% of adolescent boys. A total of 35 mothers (75%) reported at least one significant COVID-19-related life event, most commonly a change in schooling (51%) and loss/change of job (29%). Adolescents' self-reported COVID-19 impact on diabetes management was associated with the pandemic's impact on mood ($r = 0.37$, $P = 0.016$), but this finding was not observed for mothers' reports ($r = -0.06$). The only significant difference between participants who completed the intervention was for adolescents' reports of the impact of COVID-19 on diabetes management, in which those in the intervention group reported a higher impact on diabetes management than those in the control group (mean scores 29.67 and 25.58, respectively; $t = 2.45$, $P = 0.023$).

Figure 1 illustrates differences and overlap in how adolescents and mothers responded to the open-ended questions about the impact of COVID-19 on diabetes management and how they responded to COVID-19-related stress. Notably, only 6 of 51 mothers reported "no" impact on type 1 diabetes management, compared with 13 of 23 adolescent boys and 8 of 25 adolescent girls. Both adolescents and mothers described negative COVID-19-related effects on diabetes management, including loss of routine and fewer blood glucose checks (e.g., "He's home more, and at home [he] gets out of routine and skips blood checks more."). Participants also described disrupted sleep and eating schedules (e.g., "Since we have been out of school, I have had a terrible

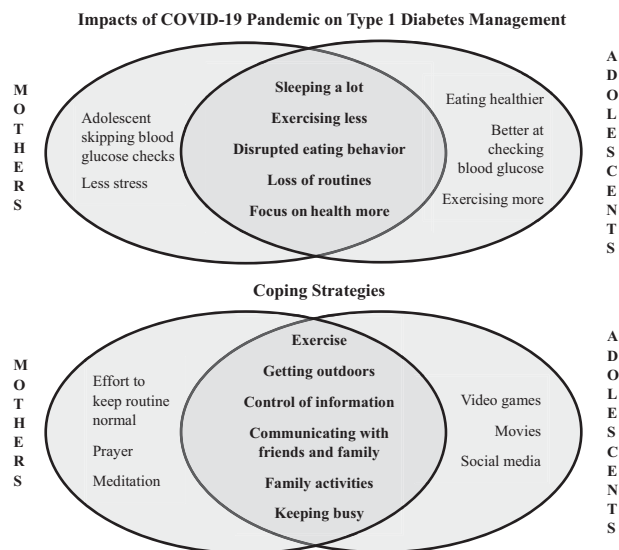


FIGURE 1 Responses to questions about the impact of COVID-19 on diabetes management and coping strategies.

sleeping schedule, which makes it difficult to wake up in the mornings and check my sugar. I haven't been on an eating schedule like I would be if I was in school."). Several participants also reported positive effects on diabetes management, including eating more healthy foods and having more time to focus on health and exercise (e.g., "It caused my life [to] come to a stop for a minute; however, it allowed me to start exercising more and eating better, which in turn helped my blood sugar."). Participants frequently reported an impact on blood glucose levels, but the directions varied.

To deal with COVID-19-related stress, both adolescents and mothers reported limiting screen time and access to news media and employing risk reduction strategies such as limiting public outings, wearing masks, physical distancing, and using telehealth (e.g., "We are super careful about taking her out and only do what is necessary, like doctor or therapy appointments [and] then we bring her straight home."). Participants also described engagement coping strategies such as staying active, getting outdoors, exercise, prayer and meditation, and communicating with friends and family (e.g., "I talk to my mom or friends about the pandemic but try not to watch a lot on it, so I don't worry all the time about it. I . . . talk to my friends online or text to keep in touch with them." and "I tried to spend as much time as possible with both children, to help them cope with the massive change in our lives brought on by COVID-19. We watched TV/movies, played video games, went for walks in the neighborhood."). Several adolescents also reported using social media, video games, and movies to deal with COVID-19.

Discussion

To understand the effects of the pandemic beyond the health consequences of contracting COVID-19 (9), monitoring for COVID-19–related acute and longer-term psychosocial consequences is needed, especially in at-risk families. This study in adolescents with type 1 diabetes and their mothers, who are already more prone to mental health issues, reveals that health care providers and researchers should not assume that the impact of COVID-19 on diabetes management and mental health is solely negative. Rather, our findings suggest some positive effects on diabetes management, but the high levels of worry and anxiety about the pandemic among some mothers indicate that providers should focus on the impact of the pandemic on caregivers and identifying resources available to support them (10).

In our sample, we found that increased time at home may have positive effects on diabetes management, with more time for physical activity and family meals. These findings are in line with a recent study that found improvements in adults' diabetes management during pandemic lockdown (11), as well as reports of improvements in mental health among some adolescents during the spring and summer of 2020, which may be attributed to increased sleep, decreased stress related to school or extracurricular activities, and increased family time (3). On the other hand, it is possible that mothers are buffering the effects of the pandemic on their children, as mothers were much less likely than their adolescent children to say there was “no” impact on diabetes management. Significant challenges related to diabetes management also emerged, particularly related to disruption of routines.

Provided that these findings are confirmed in a larger and more diverse population that includes greater socioeconomic and racial/ethnic diversity, this study offers important implications for health care teams. Our findings highlight the need to check in with mothers regarding the impact of COVID-19 on diabetes management and mood, especially for those experiencing disruptions to work and schooling (3), and to provide resources as needed. In addition, consistent with previous research emphasizing the importance of strengths-based approaches (12), providers are encouraged to focus on strengthening resilient behaviors in the face of extreme adversity. Encouraging families to recreate or develop new routines (13) and to use adaptive coping strategies such as seeking social support and engaging in positive family activities may mitigate the negative impact of COVID-19 on diabetes management and psychosocial outcomes.

Longitudinal studies are needed to further illuminate the impact of COVID-19 on youth with type 1 diabetes and their caregivers. Additionally, given that study participants agreed to enroll in a clinical trial and completed the COVID-19 survey at different points in the timeline of the pandemic, our findings may not be generalizable, and the intervention may have had effects on participants' coping. Although the use of open-ended questions offered insight into the challenges and opportunities experienced by families, qualitative interviews would offer richer data on their experiences. Greater attention is also needed to assess the impact of COVID-19 on caregivers' stress and mood, including fathers and other caregivers, which may impair their ability to effectively manage diabetes (10). Still, given the dearth of knowledge regarding the impact of COVID-19 on diabetes management and stress, findings from this study may guide future clinical and research endeavors.

In summary, families at greater risk for mental health problems demonstrated resilience in dealing with COVID-19, as many described using adaptive coping strategies and engaging in new health behaviors related to diabetes management. Additionally, mothers in our sample were more likely than their adolescent children to report anxiety and worry related to COVID-19. Hence, clinicians should provide additional support to mothers, while also recognizing the importance of a strengths-based approach. Future work is needed to identify how reactions to COVID-19 change over time, particularly with increased access to vaccines, and to develop strengths-based approaches in the context of novel stressors such as the COVID-19 pandemic so providers can optimally support distressed families.

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DUALITY OF INTEREST

No potential conflicts of interest relevant to this article were reported.

AUTHOR CONTRIBUTIONS

E.R.G. conducted quantitative analyses and wrote the manuscript. E.M.B. conducted qualitative analyses and edited the manuscript. L.S.M. designed the study and edited the manuscript. L.L.N. reviewed/edited the manuscript. F.E. edited the manuscript and created the figure. S.S.J. designed the study and wrote the manuscript. S.S.J. is the guarantor of this work and, as such, had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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