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ORIGINAL ARTICLE

Parenting with chronic illness: Parental burnout is associated with higher HbA1c among mothers with Type 2 Diabetes

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Abstract

Parental burnout (PB) is a chronic stress condition characterized by exhaustion in the parental role, emotional distancing from one's children, and a perceived loss of parental efficacy. Although psychological stress is known to impair glycemic regulation, the role of PB has not been examined in adults managing their own chronic illness. This study investigated whether mothers and fathers with type 2 diabetes mellitus (T2DM) experience greater PB than healthy control parents and explored associations between PB and glycemic control. A total of 128 mothers and fathers aged 25–50 years participated, including 62 parents with T2DM and 66 control parents without chronic illness. Sociodemographic and clinical data (HbA1c, BMI, disease duration, treatment regimen) were collected, and all participants completed the Parental Burnout Assessment (PBA). Parents with T2DM reported higher PB scores across all dimensions and on the total scale compared with controls. Within the T2DM group, higher HbA1c levels were associated with greater emotional exhaustion. Gender-stratified analyses showed no difference between mothers and fathers. However, higher HbA1c levels were associated with multiple dimensions of PB among mothers with T2DM, whereas such associations were not observed in fathers.

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These findings suggest that PB may be an underrecognized psychosomatic stressor in T2DM, reflecting the interplay between parenting demands, chronic illness management, and health outcomes. Because of the cross-sectional design, the association between parental burnout and glycemic control may be bidirectional. Further research is warranted to explore mechanisms and to inform gender-sensitive psychosocial interventions in chronic illness care.

Introduction

Parental chronic illness is a significant psychosocial stressor that can impair family functioning and parenting capacity, making it an important concern for child and adolescent psychiatry practice. Children of chronically ill parents may struggle with a limited understanding of the illness, take on caregiving roles prematurely, and experience anxiety about disease inheritance, while parents may feel guilt over disrupted routines and interactions [1-2]. These dynamics contribute to poorer psychosocial outcomes in children, underscoring the importance of considering parents' own psychological vulnerabilities in the context of chronic illness.

Type 2 Diabetes Mellitus (T2DM), a common and demanding chronic condition, adds particular challenges due to its ongoing self-management requirements. Adults with T2DM frequently report "diabetes burnout," characterized by emotional exhaustion, hopelessness, and reduced adherence [3]. For parents, such strain may interact with another emerging construct, parental burnout, which is defined as a state of chronic exhaustion in the parental role, characterized by emotional distancing from one's children, loss of efficacy, and feelings of being overwhelmed [4-5].

Parental burnout is increasingly recognized as a global problem with serious consequences, including child neglect, abuse, and escape ideation [4,6-9]. Research highlights consistent risk factors, such as high parenting demands, insufficient coping resources, and contextual stressors [10-11]. The Balance Between Risks and Resources (BR^2) model posits that burnout occurs when parental demands exceed the available individual and environmental resources [12]. Chronic illness, such as T2DM, represents a critical added burden that may heighten vulnerability to burnout. Importantly, chronic psychological stress can also impair diabetes self-management and worsen glycemic control, suggesting a potential psychosomatic feedback loop between parental burnout and T2DM outcomes [13-14].

Previous research has examined parental burnout in families of children with chronic conditions or disabilities [15-17]. However, little is known about parental burnout in the context of parents' own chronic physical illnesses. Given the conceptual similarities between diabetes burnout and parental burnout, it is plausible that the two conditions may exacerbate one another. The present cross-sectional study aimed to address this gap by investigating whether parental burnout is elevated in adults with T2DM, and how it relates to clinical indicators of disease control. To our knowledge, this is the first study to investigate parental burnout in adults with Type 2 Diabetes Mellitus, providing novel evidence on how chronic physical illness in parents may contribute to burnout risk and its clinical correlates.

Materials and Methods

The study was approved by the Kırşehir Ahi Evran University Health Sciences Scientific Research Ethics Committee with approval number 2025-11/116 at its meeting on 10 June 2025. All procedures contributing to this work complied with the ethical standards of the relevant institutional and national committees on human experimentation and with the Declaration of Helsinki. Written informed consent was obtained from all participants before inclusion and for anonymous publication of the findings.

Study design and hypotheses

This cross-sectional case-control study was conducted in the Family Medicine outpatient clinic of Kirsehir Research and Training Hospital, between June 2025 and August 2025. We aimed to test the following hypotheses: (1) parents with Type 2 Diabetes Mellitus (T2DM) experience higher parental burnout than controls without chronic disease; (2) parental burnout is associated with clinical parameters in parents with T2DM, including disease duration, treatment regimen, glycemic control, and body mass index (BMI); (3) mothers with T2DM experience higher parental burnout than fathers with T2DM; and (4) parental burnout–related clinical parameters differ by gender.

Participants

Participants were recruited consecutively during routine outpatient visits, with convenience sampling applied within the eligible pool. Sample size was estimated a priori using G*Power to detect moderate correlations ($r = 0.30$) at $\alpha = 0.05$ and power $(1–\beta) = 0.80$, requiring a minimum of 64 participants per group. Eligible participants for the T2DM group were adults aged 25–50 years with a diagnosis of T2DM for at least six months, who had at least one child aged 6–18 years. Parents with preschool-aged children were excluded because of the distinct developmental demands. We also excluded individuals with comorbid chronic conditions (e.g., hypertension, coronary artery disease) to reduce confounding effects. The control group consisted of adults aged 25–50 years with no chronic diseases, recruited from the same clinic, who had at least one child aged 6–18 years. For both groups, exclusion criteria were: having more than three children, physical disability, present or past psychiatric diagnosis, or hospitalization/surgery in the last two years. Divorced, widowed, or otherwise single parents were eligible and coded as a yes/no variable labelled “single parenting.” Regarding family composition, if both parents had a diagnosis of T2DM, only one parent from the same household could be included in the study.

Procedure

After informed consent, sociodemographic data were collected (education, employment, income, marital status, number of children). For the T2DM group, clinical data included HbA1c (defined as the most recent value within the last three months of PBA completion), BMI (clinician-measured), treatment regimen (insulin use vs. oral medication), and disease duration. All participants completed the Parental Burnout Assessment (PBA).

Measurement tools

Parental Burnout Assessment (PBA): This tool comprises 23 items that measure parental burnout levels and are rated on 7-point Likert scales: never (0), a few times a year or less (1), once a month or less (2), a few times a month (3), once a week (4), a few times a week (5), every day (6). The four subscales are Emotional Exhaustion (9 items), Contrast with Previous Parental Self (6 items), Feelings of Being Fed Up (5 items), and Emotional Distancing (3 items). The Turkish version of the Parental Burnout Assessment (PBA) was developed and validated by Arikan et al. (2020) as part of the International Investigation of Parental Burnout [18]. In the Turkish adaptation study, Cronbach’s alphas were .84, .77, .51, and .50 for the subscales and .90 for the total burnout score [18]. In the current sample, we obtained Cronbach’s alphas of .93, .65, .87, and .83, for the subscales, respectively, and .96 for the total burnout score. Higher scores on each subscale and the global scale indicate greater levels of parental burnout.

Table 1 presents an overview of study methods.

Table 1. Overview of methods.

Component	Description
Study design	Cross-sectional comparative study conducted in the Family Medicine outpatient clinic of Kirsehir Research and Training Hospital, June 2025 – August 2025.
Aims/Hypotheses	1. Parents with T2DM report higher parental burnout than controls. 2. Parental burnout relates to clinical parameters (disease duration, treatment regimen, HbA1c, BMI). 3. Mothers with T2DM report higher burnout than fathers. 4. Clinical correlates of burnout differ by gender.
Participants	T2DM group: Adults aged 25–50, T2DM diagnosis ≥6 months, ≥1 child aged 6–18. Control group: Adults aged 25–50, no chronic illness, ≥1 child aged 6–18.
Exclusion criteria (for both groups)	>3 children, preschool-aged children, comorbid chronic illness (e.g., hypertension, CAD), physical disability, current or past psychiatric disorder, hospitalization/surgery in past 2 years.
Sampling	Consecutive and convenience sampling.
Sample size calculation	G*Power: r = 0.30, α = 0.05, power = 0.80 → minimum 64 participants per group.
Measures	Sociodemographics: education, employment, income, marital status, number of children. Clinical data (T2DM only): HbA1c (most recent record within the last three months, BMI (clinician-measured), disease duration, treatment regimen. Psychological: Parental Burnout Assessment (PBA; 23 items, 4 subscales).
Reliability of measurements	Current sample Cronbach's α: Emotional exhaustion = .93; Contrast with previous parental self = .65; Fed up = .87; Emotional distancing = .83; Total score = .96.
Statistical analyses	Normality: Shapiro–Wilk, Kolmogorov–Smirnov. Group comparisons: χ^2 (categorical), Mann–Whitney U (continuous). Associations: Spearman's correlation. Gender subgroup analyses in T2DM group. $p < 0.05$ considered significant.
Ethics	Written informed consent was obtained. Procedures followed the Declaration of Helsinki (1975, revised 2013).

Statistical analyses

We used IBM SPSS 22.0 to analyze our data. Descriptive findings are presented as frequencies (percentages) for categorical variables and as summary statistics for continuous variables, as appropriate. Data normality was assessed using Shapiro–Wilk and Kolmogorov–Smirnov tests. Categorical variables were compared using χ^2 tests. Non-normally distributed continuous variables, including sociodemographic, clinical, and parental burnout measures, were analyzed using Mann–Whitney U tests. Associations between parental burnout scores and clinical parameters in the T2DM group were examined using Spearman's rank correlations. Gender-based subgroup comparisons within the T2DM group were also examined using Mann–Whitney U tests. Statistical significance was set at $p<0.05$.

Results

Descriptive and group comparisons

Sociodemographic characteristics of the T2DM group (n = 62) and the control group (n = 66) are presented in Table 2. The groups did not differ significantly in sex, educational level, employment, income, marital status, number of children, or developmental stage of children (all $p>.05$). The T2DM group was significantly older than controls ($Z = –2.16$, $p=.03$). Parents with T2DM scored higher on all Parental Burnout Assessment subscales: emotional exhaustion ($Z = –7.07$, $p<.01$), contrast with previous parental self ($Z = –5.48$, $p<.01$), feelings of being fed up ($Z = –6.20$, $p<.01$), and emotional distancing ($Z = –6.52$, $p<.01$), as well as on the total score ($Z = –6.81$, $p<.01$).

Table 2. Comparison of the T2DM group and control group.

	T2DM Group (n=62)	Control Group (n=66)	Statistics
Age (years)	43.00 (27.00–50.00)	40.00 (26.00–50.00)	Z = -2.16, ***p*=.03**[a]
Sex	Female: 32 (51.6) Male: 30 (48.4)	Female: 39 (59.1) Male: 27 (40.9)	χ^2 = .72, *p*=.40[b]
Educational (years)	12.00 (5.00–22.00)	16.00 (5.00–22.00)	Z = -1.38, *p*=.17a
Working status	Actively working: 40 (64.5)	Actively working: 52 (78.8)	χ^2 = 3.22, *p*=.07[b]
Monthly income (TL)	50000.00 (0.00–200000.00)	50000.00 (0.00–475000.00)	Z = -.22, *p*=.83[a]
Marital status	Married: 54 (87.1) Single: 8 (12.9)	Married: 59 (89.4) Single: 7 (10.6)	χ^2 = .16, *p*=.69[b]
Children count (number)	1.00 (1–3)	2.00 (1–3)	Z = -.64, *p*=.52[a]
School-age child (6–12 years)	43 (69.4)	48 (72.7)	χ^2 = .18, *p*=.67[b]
Adolescent child (13–18 years)	37 (59.7)	33 (50.0)	χ^2 = 1.21, *p*=.27[b]
Parental Burnout Assessment			
Emotional exhaustion	33.50 (1.00–54.00)	9.50 (0.00–42.00)	Z = -7.07, ***p*<.01**[a]
Contrast with previous parental self	12.50 (0.00–27.00)	4.50 (0.00–25.00)	Z = -5.48, ***p*<.01**[a]
Feelings of being fed up	14.00 (0.00–30.00)	3.50 (0.00–28.00)	Z = -6.20, ***p*<.01**[a]
Emotional distancing	10.00 (0.00–18.00)	2.00 (0.00–15.00)	Z = -6.52, ***p*<.01**[a]
Total burnout score	70.50 (2.00–129.00)	22.50 (0.00–109.00)	Z = -6.81, ***p*<.01**[a]

[a]*Continuous variables are presented as median (minimum–maximum) and were compared using Mann–Whitney U tests.*
[b]*Categorical variables are presented as n (%) and were compared using χ^2 tests. Statistically significant p-values are indicated in bold.*

Clinical correlates in the T2DM group

Table 3 presents the clinical correlates within the T2DM group. Emotional exhaustion was positively correlated with HbA1c levels (r = .31, *p*=.01). No significant associations were found between BMI or diabetes duration and any PBA subscale (all *p*>.05). HbA1c was not related to other subscales or the total score. In the control group, total burnout was negatively correlated with income (r = –.31, *p*=.01) and positively correlated with the number of adolescent children (r = .35, *p*<.01).

Table 3. Correlates of the Parental Burnout in T2DM group (n = 62).

	Duration of diabetes (years)	HbA1c (%)	Body Mass Index
Parental Burnout Assessment			
Emotional exhaustion	r = -.02, *p*>.05	r = .31, ***p*=.01**	r = -.07, *p*>.05
Contrast with previous parental self	r = -.11, *p*>.05	r = .14, *p*>.05	r = .04, *p*>.05
Feelings of being fed up	r = -.03, *p*>.05	r = .22, *p*>.05	r = -.03, *p*>.05
Emotional distancing	r = -.21, *p*>.05	r = .03, *p*>.05	r = -.18, *p*>.05
Total burnout score	r = -.11, *p*>.05	r = .20, *p*>.05	r = -.09, *p*>.05

Spearman's correlation coefficients (r) and p-values are presented. Significant results are indicated in bold.

Gender comparisons in the T2DM group

Subgroup comparisons between mothers (n = 32) and fathers (n = 30) with T2DM are presented in Table 4. Sociodemographic differences were observed between mothers and fathers with T2DM: mothers had lower education (Z = –2.19, p=.03), were less likely to be employed (χ^2 = 8.99, p=.003), and reported lower monthly income (Z = –2.70, p=.01). No significant gender differences were found on PBA subscales or the total score (all p>.05).

Table 4. Comparison of the T2DM group subgroups mothers and fathers.

	T2DM Group – Mothers (n=32)	T2DM Group – Fathers (n=30)	Statistics
Age (years)	42.00 (27.00–50.00)	46.50 (28.00–50.00)	Z = -1.64, p=.10[a]
Education (years)	12.00 (5.00–22.00)	16.00 (5.00–22.00)	Z = -2.19, ***p*=.03**[a]
Working status	Actively working: 15 (46.9)	Actively working: 25 (83.3)	χ^2 = 8.99, ***p*<.01**[b]
Monthly income (TL)	11000.00 (0.00–200000.00)	65000.00 (0.00–200000.00)	Z = -2.70, ***p*=.01**[a]
Marital status	Married: 28 (87.5) Single: 4 (12.5)	Married: 26 (86.7) Single: 4 (13.3)	χ^2 = .01, p=.92[b]
Children count (number)	1.00 (1.00-3.00)	1.00 (1.00-3.00)	Z = -.39, p=.70[a]
School-age child (6–12 years)	22 (68.8)	21 (70.0)	χ^2 = .01, p=.92[b]
Adolescent child (13–18 years)	18 (56.3)	19 (63.3)	χ^2 = .32, p=.57[b]
Parental Burnout Assessment			
Emotional exhaustion	32.00 (1.00–54.00)	35.00 (2.00–54.00)	Z = -.88, p=.38[a]
Contrast with previous parental self	12.00 (0.00–27.00)	13.00 (2.00–24.00)	Z = -1.08, p=.28[a]
Feelings of being fed up	14.00 (0.00–30.00)	15.00 (4.00–30.00)	Z = -1.26, p=.21[a]
Emotional distancing	10.00 (0.00–18.00)	10.50 (0.00–18.00)	Z = -.64, p=.52[a]
Total burnout score	69.50 (2.00–129.00)	74.00 (8.00–120.00)	Z = -1.21, p=.23[a]

[a]*Continuous variables are presented as median (minimum–maximum) and were compared using Mann–Whitney U tests.*

[b]*Categorical variables are presented as n (%) and were compared using χ^2 tests. Statistically significant p-values are indicated in bold.*

Gender-Specific correlates of parental burnout

As shown in Table 5, among mothers with T2DM, HbA1c correlated positively with emotional exhaustion (r = .56, p<.01), feelings of being fed up (r = .47, p<.01), and the total burnout score (r = .48, p<.01). No significant associations were observed between HbA1c and burnout scores among fathers. Neither BMI nor diabetes duration was significantly related to burnout in either subgroup.

Table 5. Correlates of the parental burnout in T2DM group subgroups mothers and fathers.

	Duration of diabetes (years)		**HbA1c (%)**		**Body Mass Index**	
	Mothers (n=32)	Fathers (n=30)	Mothers (n=32)	Fathers (n=30)	Mothers (n=32)	Fathers (n=30)
Parental Burnout Assessment						
Emotional exhaustion	r = .14 *p*>.05	r = -.22 *p*>.05	r = .56 ***p*<.01**	r = .02 *p*>.05	r = .01 *p*>.05	r = -.10 *p*>.05
Contrast with previous parental self	r = .05 *p*>.05	r = -.33 *p*>.05	r = .30 *p*>.05	r = -.04 *p*>.05	r = .06 *p*>.05	r = .12 *p*>.05
Feelings of being fed up	r = .09 *p*>.05	r = -.22 *p*>.05	r = .47 ***p*<.01**	r = -.09 *p*>.05	r = -.01 *p*>.05	r = -.03 *p*>.05
Emotional distancing	r = -.10 *p*>.05	r = -.36 *p*>.05	r = .34 *p*>.05	r = -.35 *p*>.05	r = -.22 *p*>.05	r = -.03 *p*>.05
Total burnout score	r = .07 *p*>.05	r = -.28 *p*>.05	r = .48 ***p*<.01**	r = -.11 *p*>.05	r = -.06 *p*>.05	r = -.03 *p*>.05

Spearman's correlation coefficients (r) and p-values are presented. Significant results are indicated in bold.

Discussion

This study compared parental burnout between adults with and without T2DM and explored associations with clinical and gender-related factors. Parents with T2DM reported significantly higher burnout across all PBA dimensions. Within the T2DM group, HbA1c was positively associated with emotional exhaustion, and this association was particularly pronounced among mothers, who also showed links between HbA1c and overall burnout levels. No associations emerged with BMI or diabetes duration. Gender comparisons revealed no overall differences in parental burnout severity; however, mothers reported experiencing socioeconomic disadvantages relative to fathers. In the control group, parental burnout was associated with lower income and a higher number of adolescent children.

The finding that parents with T2DM experience greater parental burnout is consistent with the Balance Between Risks and Resources (BR²) model, which posits that burnout occurs when demands outweigh available coping resources [12]. Living with T2DM adds a chronic layer of physiological, cognitive, and emotional strain, which may erode resilience and intensify the pressures of parenting. Our results also align with previous work on diabetes burnout [3], suggesting that diabetes-related distress may intersect with parental role demands in ways that heighten vulnerability to parental burnout. In the control group, burnout was linked to socioeconomic stressors such as low income and raising adolescents, consistent with prior research on financial strain and parenting stress [11]. In contrast, in the T2DM group, illness burden may overshadow other contextual stressors, or ceiling effects may constrain variability.

The observed association between HbA1c and emotional exhaustion should be interpreted cautiously. Because of the cross-sectional design, this relationship may be bidirectional: greater parental burnout may contribute to poorer glycemic control through stress-related and behavioral pathways, while poorer glycemic control and the burden of diabetes management may also increase perceived parental strain and burnout. Previous studies have shown that women with T2DM experience greater psychosocial stress and worse outcomes than men [19]. Our results add nuance by showing that maternal, but not paternal, burnout was associated with clinical outcomes in this sample. Mothers may be more emotionally invested in parenting and more prone to neglect self-care out of guilt or perceived inadequacy [10,20]. In contrast, fathers showed no significant clinical correlates, though negative trends with disease duration suggest possible difficulties during early adaptation to diabetes.

Large-scale international studies consistently show that women are more vulnerable to parental burnout than men [8]. This heightened risk is not explained solely by workload, but also by the disproportionate cognitive and emotional labor that mothers often assume, such as organizing, monitoring, and maintaining emotional attunement with their children [12,21]. In many cultures, including our own, mothers are expected to uphold high standards of parenting while also managing household responsibilities and caregiving, often under conditions of limited social or institutional support. For women living with T2DM, these pressures may compound the psychological burden of illness management. Sociocultural norms that idealize maternal self-sacrifice may also discourage women from prioritizing their own health, leading to neglect of diabetes self-care in favor of parenting obligations [20]. In this sense, the combination of gendered parenting expectations and chronic illness can create a "double bind" for mothers, leaving them especially vulnerable to exhaustion, guilt, and feelings of inadequacy. Our findings, that maternal but not paternal burnout correlates with glycemic control, highlight the importance of considering cultural and gender-specific psychosocial and cultural dynamics in both research and clinical practice.

These results underscore parental burnout as a potentially underrecognized psychosomatic correlate of T2DM. Screening for parental burnout in diabetes care could help identify at-risk parents, particularly mothers with poorer glycemic control. Integrating psychological support and family-focused interventions into routine diabetes management may strengthen coping resources, protect parental well-being, and may also support metabolic outcomes. More broadly, the findings support calls for gender-sensitive, psychosomatically informed diabetes care.

Several limitations of the current study must be mentioned. The cross-sectional design precludes causal inference, and the reliance on self-report measures introduces potential bias. The modest sample size, especially in subgroup analyses, limits generalizability, as does recruitment from a single outpatient clinic. In addition, the T2DM group was significantly older than the control group, so age may have acted as a confounding factor in the interpretation of between-group burnout differences. Single-parent families were not excluded from the sample or analyzed separately, which makes it difficult to draw conclusions about the effects of single parenting. Because only one parent per household could be included, we also could not examine dyadic or within-couple patterns in families in which both parents had T2DM. Findings related to the "contrast with previous parental self" subscale should also be interpreted with some caution because its internal consistency in the current sample was more modest than that of the other subscales (Cronbach's $\alpha = .65$). Future research should replicate these findings in larger, more diverse samples and employ longitudinal designs to clarify how changes in glycemic control interact with the course of parental burnout. Qualitative studies may further illuminate how mothers and fathers experience the dual demands of illness and parenting, and future work would also benefit from assessing children's psychological symptoms alongside parental measures. Finally, our findings raise the possibility that parental burnout may partially contribute to the elevated depression rates reported among women with T2DM [22-23], a hypothesis warranting further longitudinal investigation.

Conclusion

Parental burnout appears to be an underrecognized psychosomatic stressor in parents living with type 2 diabetes mellitus (T2DM). In this study, parents with T2DM reported higher burnout across all parental burnout dimensions than healthy control parents, suggesting that the demands of chronic illness management may compound the emotional burden of parenting. Within the T2DM group, poorer glycemic control was associated particularly with emotional exhaustion, and among mothers HbA1c was also related to feelings of being fed up and to total parental burnout. These findings support the view that parental burnout is not merely a background psychosocial burden, but a clinically relevant correlate of illness management in some parents with T2DM.

From a practical perspective, incorporating brief psychosocial inquiry into routine diabetes care may help identify parents at risk, especially mothers presenting with suboptimal glycemic control or broader emotional strain. Gender-sensitive psychosocial support, psychoeducation, and family-oriented interventions may help strengthen coping resources, improve parental well-being, and potentially support metabolic outcomes. Early recognition may also matter beyond the individual parent, because persistent parental burnout may adversely affect family functioning and the psychological well-being of children growing up in the context of parental chronic illness.

At the same time, these results should be interpreted cautiously because the cross-sectional design does not permit causal inference and the observed relationship may be bidirectional. Future studies should replicate these findings in larger and more diverse samples, use longitudinal designs, and assess children's psychological symptoms and functioning alongside parental burnout and metabolic indicators. Incorporating child-reported outcomes and/or clinician-based child assessments may clarify whether parental burnout in the context of T2DM is primarily a marker of parental distress, a contributor to family-level difficulties, or both.

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Conflict of interest

The authors have no financial or non-financial competing interests to declare that are relevant to the content of this article.

Data availability statement

The data supporting the findings of this study are available upon request from the corresponding author. The data are not publicly available because they contain information that could compromise the privacy of research participants.

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