

Caregivers in anorexia nervosa: Is grief underlying parental burden?

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Abstract

Purpose. Anorexia Nervosa (AN) is a severe chronic disorder and parents' experience of caregiving is usually marked by emotional distress and burden. Severe chronic psychiatric disorders are known to be linked with the concept of grief. Grief has not been investigated in AN. The aim of this study was to examine parents' and adolescents' characteristics that underlie parental burden and grief in AN, and the link between these two dimensions.

Methods. Eighty mothers, 55 fathers and their adolescents (N=84) hospitalized for AN participated in this study. Evaluations of clinical characteristics of the adolescent's illness were completed, as well as self-evaluations of adolescent and parental emotional distress (anxiety, depression, alexithymia). Levels of parental burden were evaluated with the Experience Caregiving Inventory and levels of parental grief with the Mental Illness Version of the Texas Revised Inventory of Grief.

Results. Main findings indicated that burden was higher in parents of adolescents with a more severe AN; fathers' burden was also significantly and positively related to their own level of anxiety. Parental grief was higher when adolescents' clinical state was more severe. Paternal grief was related to higher anxiety and depression, while in mothers, grief was correlated to higher alexithymia and depression. Paternal burden was explained by father's anxiety and grief, and maternal burden by mother's grief and her child's clinical state.

Conclusion. Parents of adolescents suffering from AN experienced high levels of burden, emotional distress and grief. These perceptions (that are also inter-related) should be specific targets for intervention aimed at supporting parents. Our results sustained the extensive literature on the need to assist fathers and mothers in their caregiving role. This in turn may improve both their mental health and their abilities as caregivers of their suffering child.

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grief; burden; caregiving; parents; anorexia nervosa; gender role

Level of evidence III

What Is Already Known On This Subject

What is already known on this subject? Parents of adolescents with AN suffer from emotional distress and burden. While caregiver burden in AN has been extensively explored, its relationships with parental feelings of loss and grief have not and gender-role differences either in shaping these relationships have not either.

What this study adds? Our results confirm that parents of adolescents suffering from AN experience high level of burden, emotional distress and grief. On a clinical level, all three must to be taken into account within the context of the patient's clinical state. Presence of important gender and parental role

differences also have an impact on the level of expressed emotional distress. Gender specific-support regarding burden and grief could be provided in individual therapy and parents groups, as well as in family-oriented approaches such as single- and multi-family therapy.

Introduction

Anorexia nervosa (AN) occurs most frequently during adolescence or early adulthood. It can last several years [1, 2] and parents are often involved as caregivers for many years [3]. Involving relatives in the treatment of AN is internationally recommended [4, 5]. Yet, parental involvement may result in many coping difficulties, which can hinder the patient's treatment and recovery [6] and in turn affect caregiving role/experiences. Indeed it has been shown that caregivers of persons with an eating disorder (ED) suffer from feelings of burden and emotional distress, with high levels of depression and anxiety [7–10]. In addition, alexithymia as an emotional state is probably part of this clinical picture and should be explored. Indeed, alexithymia is characterized by difficulties identifying feelings and differentiating between feelings and bodily sensations, difficulties communicating feelings and a concrete cognitive style focused on the external environment [11].

The concept of caregiver burden can be divided into an objective component and a subjective one [12]. Objective burden involves a disruption of family/household life owing to the patient's illness, which is potentially verifiable and observable [13]. Subjective burden refers to subjective distress among family members. Within the field of ED, the level of parental burden has been shown to be linked to different factors. It is positively correlated with higher levels of parents' emotional distress (anxiety and depression), higher duration of time spent together [14] and longer duration of the AN illness [15, 16]. In addition, studies have found that the feeling of burden is significantly higher in mothers compared to fathers [8, 15–18].

In chronic psychiatric disorders, parents frequently describe a sense of loss that accompanies a loved one's mental disorder [19]. Indeed, parents may feel they have lost their child's former or idealized self, and hopes for the future can be disrupted. In AN, parents also report mourning the missed experience of a normal adolescent period. Parents who endure losses can experience grief [19, 20]. In the context of schizophrenic patient families, Patterson's team assessed the possible link between parental current grief and burden over a 9-month follow-up period [21]. In a recent study on caregiving of patients with dementia, a direct link between burden and grief has been shown, with high levels of grief amplifying the effect of burden on caregiver depression [22]. To our knowledge, the grief process in AN has not yet been explored, nor whether it is linked to burden. This study explores: (1) the link between parental burden and parental emotional distress (including alexithymia)/child's clinical state on one hand, and between parental grief and the same variables on the other hand; (2) whether burden in caregivers can be explained by grief, taking into account parental emotional distress and the child's clinical state which are known to have an impact on burden.

Methods

- **Procedure and Ethics**

Prior to inclusion in the EVHAN study, all participants were hospitalized for an acute AN episode in a French specialized treatment facility for life-threatening physical and/or mental states.

Inclusion criteria for adolescents were as follows: between 13 and 21 years of age, living with their parents before admission, at least one parent accepted to be interviewed and included in the study. Exclusion criteria for both patients and their parents included: refusal to participate, insufficient command of the French language and a potentially confounding somatic pathology (such as diabetes, Crohn's disease or another metabolic disease).

A total of 80 mothers, 55 fathers and their adolescents hospitalized for AN (N = 84) participated in this study. The socio-demographic data and socioeconomic status of the non-participating parents were not statistically different from those of participating parents.

- **Participant measures**

All participants' data (parents and their child) were collected during the first 2 weeks of inpatient admission.

- **Parental measures**

Sociodemographic data included age, socioeconomic and marital status of parents.

Experience of burden was assessed with the **Experience Caregiving Inventory (ECI)** [12]. The ECI is the gold standard to assess burden and provides a global rating, which is derived from how distressed parents feels regarding the patient's illness [18]. It consists of 66 items assessed with a five-point Likert scale (0: never, 1: rarely, 2: sometimes, 3: often, 4: nearly always). The negative aspect of caregiving comprises eight subscales: difficult behaviors, negative symptoms, stigma, problems with services, effects on family, need to backup, dependency and sense of loss. The 2 subscales dealing with positive aspects of caregiving measure positive personal experiences and good relationships with the patient. The negative and positive subscale scores are summed up to yield total negative and total positive appraisal scores. The sum of the negative subscales produces a total negative aspect score also called burden, higher scores reflecting higher experience of burden [12, 21]. For this study, we only considered the Total negative burden score (ECI- Burden).

Grief was assessed with the **Mental Illness Version of the Texas Revised Inventory of Grief (MIV-TIG)** [23]. The MIV-TIG is an adapted version of the Texas Revised Inventory of Grief [24], used to assess grief reactions to the death of a loved one. It was modified to assess grief as a result of a relative's mental illness and the loss of that person as s/he was before the development of mental illness. The scale includes the different known expressions of grief such as persistent emotional distress, being constantly occupied with the lost person, and difficulties and unwillingness to acknowledge and accept the reality of the loss. It is a 24-item scale in which the first eight items assess present grief (MIV-TIG -A) and the

remaining 16 items assess current grief (MIV-TIG -B). Items are focused on the loss of aspirations and cherished hopes for the individual and intrusive memories of the individual as s/he used to be. Parents were asked to respond to the items based on a five-point Likert scale ranging from completely true (1) to completely false (5). Item scores are summed up into a total score (ranging from 16 to 80) where lower scores reflect higher grieving. We only considered the MIV-TIG B part, also called MIV-Grief.

Levels of anxiety were measured with the French validated version of **the Hospital Anxiety and Depression Scale** (HADS) [25, 26]. The HADS comprises 14 self-reported items, where parents are asked to respond on a four-point Likert scale. Seven items deal with depression while the remaining 7 assess anxiety. A total score for emotional distress ranges from 0 to 42, with higher scores indicating more distress. For the purpose of this study, we only considered the total anxiety score (called HADS-anx), with higher scores reflecting higher levels of anxiety (ranging from 0 to 21, with probable anxiety symptomatology around a score of 8 [25, 26]).

Levels of depression were evaluated with the French validated version of the **Beck Depression Inventory** (BDI) [27–29]. It consists of 21 items describing somatic and cognitive-affective depressive symptoms. Each item is scored on a scale from 0 to 3 reflecting participants' feelings during the previous two weeks. Based on the 21 items, a total score indicates the level of depressive symptoms: minimal–moderate depressive symptoms (range 14–19), moderate depressive symptoms (range 20–29), severe depressive symptoms (range 30–63).

Levels of alexithymia were evaluated with the French validated version of the **Bermond-Vorst Alexithymia Questionnaire** (BVAQ-B) [30, 31]. The B form consists of 20 self-reported items and includes five factors: Emotionalizing and Fantasizing make up the affective dimension of alexithymia, while Identifying, Analyzing and Verbalizing make up the cognitive dimension. Ratings are provided on a 5-point Likert scale; total scores range from 20 to 100, with higher scores indicating higher alexithymia.

- **Adolescent measures**

We collected the following sociodemographic and clinical data among the adolescent population: gender, age, family composition, educational and/or professional levels, AN subtype, age at AN onset, AN duration, nutritional status by means of current body mass index (BMI) and minimum lifetime BMI.

Current AN diagnosis was based on the Diagnostic and Statistical Manual of Mental Disorders criteria : all patients had a DSM-5 diagnosis of AN [32]. The following BMI criteria were used: BMI < 10th percentile up to 17 years of age, and BMI < 17.5 for 17 years of age and above, as in previous studies [33, 34].

The self-report **Eating Disorders Examination Questionnaire** (EDE-Q 5.2) [35] was used to assess core features of the ED psychopathology. A global score (0–6) was obtained through four subscales: Dietary Restraint, Eating Concerns, Weight Concerns, and Shape Concerns. Higher scores indicate greater ED psychopathology.

The **Morgan-Russell Global Outcome Assessment Schedule** (MR-GOAS) [36, 37] was used to assess essential clinical features of AN. It is a semi-structured interview which is widely used for that purpose. A quantitative score (0–12) was obtained through five subscales: Food intake, Menstrual state, Mental state, Psychosexual state and Socioeconomic status. The higher the score, the better the clinical state.

- **Determination of the factors impacting burden and grief**

We considered factors impacting burden that have been reviewed in the literature: parental emotional distress (depression, anxiety); age of patient; age of AN onset; AN duration; gender; AN subtype [7, 10, 14, 16, 18], to which we added alexithymia. Factors impacting grief were determined according to the existing literature on other psychiatric disorders: parental emotional distress (depression, anxiety) and illness severity (nutritional status by means of current BMI and minimum lifetime BMI, EDE-Q total score and MR-GOAS) [21, 22]. All these factors were taken into account for both burden and grief.

- **Data Analysis**

Descriptive data are provided as means (M) and standard deviations (SD) for continuous variables or counts (n) and percentages (frequencies) for categorical variables. Between group comparisons for mothers' and fathers' data (ECI-Burden; MIV-Grief; HADS-anxiety; BDI; BVAQ) were computed using paired t tests for continuous variables.

Univariate analyses were performed to examine the contribution of child and parent variables to burden and grief, using R's correlations for continuous variables (ECI-Burden; MIV-Grief; HADS-anxiety; BDI; BVAQ; MR-GOAS; illness duration), or t test for qualitative variables (type of eating disorder: AN restrictive type (AN-R) and binge-eating/purging type (AN-BP)).

Multivariate linear regressions were then performed with those variables that exhibited a significant link on the univariate analysis (95% CI = 95% Confidence Interval; R² Nagelkerke).

Multivariate linear regression was then performed to examine the contribution of children's (global clinical state and duration of AN) and parents' variables (depression, anxiety, alexithymia) selected through the univariate analysis (p -value < 0.1), first to burden (model 1) and then to grief (model 2). Finally, a third model was performed in order to test the link between burden and grief, taking into account potential contributions identified in models 1 and 2. Multivariate linear regression results are presented as R^2 and for each model and β and p -value for each variable.

As AN duration was correlated with children's age and children's age at onset (respectively, $r = 0.33$; $p = 0.00$. $r = -0.35$; $p = 0.00$), only AN duration was included in the multivariate linear regression models. Likewise, since all variables qualifying AN clinical state were correlated to MR-GOAS [minimal BMI ($r = 0.32$; $p = 0.00$), current BMI ($r = 0.28$; $p = 0.00$), BDI-depression scale ($r = -0.39$; $p = 0.00$), HADS-anxiety ($r = -0.30$; $p = 0.00$), EDE-Q ($r = 0.37$; $p = 0.00$)], only MR-GOAS score was included in the multivariate models.

All statistical analyses were performed with the IBM SPSS Statistics 20 software, using two-tailed statistical tests and a fixed significance level of 5%.

Results

- **Descriptive data.**

Parental sociodemographic data. The 55 fathers had a mean age of 47.41 years ($SD= 4.67$) [37;60] and the 80 mothers had a mean age of 45.81 years ($SD= 5.49$) [35;61]. Professional and socio-economic status [38], 40.40% of fathers were in the upper to high-middle class category, and 32.10% belonged to the middle-class category. Regarding mothers, 48.80% belonged to the middle-class category and 26.20% were in the lower-middle class category.

Parental levels of emotional distress, grief and burden (in Supplementary Table 1). Mothers showed significantly higher scores of emotional distress than fathers for anxiety and depression, while fathers indicated significantly higher scores of alexithymia than mothers ($p < 0.01$). There were no significant differences between maternal and paternal scores of grief (MIV-Grief) and burden (ECI- burden).

Adolescents' sociodemographic and clinical data. The majority of them were girls (96.4%, 81/84) with a mean age of 15.98 years ($SD= 2.32$). 25% were enrolled in primary education, 35.7% in secondary education (30/84), 7.2% in higher education (missing data for 31%). A minority was adopted (3) and 28.6% had parents who were separated. 46.40% had one sibling, 31% had two, 9.5% had three and 13.1% were only children.

The sample had a mean age of AN onset of 14.61 years ($SD= 2.38$) [8;23], a mean illness duration of 1.84 years ($SD = 1,67$) [0,2;7,9], a BMI of 14.3 upon admission ($SD = 1,39$) [11,1;18,9] and a minimum lifetime BMI of 13.61 ($SD = 1,55$) [9,9;18,5]. 53.6% met criteria for restrictive type AN (AN-R). The MR-GOAS mean score was 4.90 ($SD= 1.41$) [2,04; 7,89], suggesting poor clinical state.

- **Univariate analysis: relationships between parental burden, parental grief, and parental emotional distress and/or child clinical state.**

Burden (Supplementary Table 2): For both mothers and fathers, their level of emotional distress and their child's clinical state were both linked with their level of burden. For mothers, higher levels of anxiety (HADS-anxiety score; $p = 0.03$) and of depression (BDI score; $p = 0.01$), a longer duration of their child's illness ($p = 0.04$) and a worse child clinical state (MR-GOAS score, $p < 0.0001$) were all significantly associated with a higher maternal burden score (ECI – Burden score). The maternal level of alexithymia (BVAQ score) tended to be associated with a higher level of maternal burden ($p = 0.07$).

For fathers, a higher level of anxiety (HADS-anxiety score; $p = 0.001$) and a worse child clinical state (MR-GOAS score; tendency $p = 0.06$) were significantly related to a higher level of paternal burden (ECI score).

Grief (Supplementary Table 3): For both mothers and fathers, their level of emotional distress and their child's clinical state were related to their level of grief. For mothers, higher levels of anxiety (HADS- anxiety score; $p = 0.005$), depression (BDI score; $p < 0.0001$) and alexithymia (BVAQ score; $p = 0.001$), and a worse clinical state for their child (MR-GOAS score; $p = 0.004$) were all significantly associated with a higher current grief score (lower MIV-Grief score). For fathers, higher levels of anxiety (HADS- anxiety score; $p = 0.002$) and depression (BDI score; $p < 0.003$), and a worse clinical state for their child (MR-GOAS score; $p = 0.03$) were significantly associated with a higher current grief score (lower MIV-Grief score).

- **Multivariate analysis: Contribution of parental emotional distress and/or child's clinical state to parental burden and grief**

- **Contribution to parental burden**

For mothers' Model 1: on the basis of the univariate analysis, the following elements were introduced as explanatory variables: anxiety, depression, alexithymia, duration of illness and child's clinical state. Higher maternal burden was related to a worse child clinical state (MR-GOAS score, $\beta = -0.35$, $p = 0.00$). However, it was not associated with mothers' anxiety (HADS-anxiety score, $\beta = 0.00$, $p = 0.96$), depression (BDI score, $\beta = 0.22$, $p = 0.21$) or alexithymia (BVAQ score, $\beta = 0.97$, $p = 0.40$), nor with child AN duration ($\beta = 0.15$, $p = 0.15$). This model explained 18% of the variance ($R^2 = 0.18$).

For fathers' Model 1: We also performed a paternal model with the following explanatory variables: anxiety, depression and child clinical state. A higher paternal level of burden was significantly associated with a higher level of fathers' anxiety (HADS-anxiety score, $\beta = 0.48$, $p = 0.00$) and worse child clinical state (MR-GOAS score, $\beta = -0.33$, $p = 0.00$). Fathers' level of burden was not associated with their level of depression (BDI score, $\beta = 0.04$, $p = 0.71$). This model explained 27% of the variance ($R^2 = 0.27$).

- **Contribution to parental grief**

For mothers' Model 2: the following elements were introduced as explanatory variables, on the basis of the univariate analysis: anxiety, depression, alexithymia, and worse child's clinical state. Higher grief was explained by higher levels of mothers' depression (BDI score, $\beta = -0.55$, $p = 0.00$) and alexithymia (BVAQ score, $\beta = -0.24$, $p = 0.01$), and by children's worse clinical state (MR-GOAS score, $\beta = 0.36$, $p = 0.00$), but not by mothers' anxiety levels (HADS-anxiety score, $\beta = 0.24$, $p = 0.11$). This model explained 35% of the variance ($R^2 = 0.35$).

For fathers' Model 2: a similar paternal model was performed for grief, and the following explanatory variables were introduced: anxiety, depression, and worse child clinical state.

A higher paternal level of grief was explained by higher anxiety (HADS-anxiety score, $\beta = -0.36$, $p = 0.001$) and depression (BDI score, $\beta = -0.25$, $p = 0.04$) levels, and children's worse clinical state (MR-GOAS score, $\beta = 0.33$, $p = 0.001$). This model explained 31% of the variance ($R^2 = 0.31$).

- **Relationships between parental burden and grief**

A third model was performed in order to test the relationship between burden and grief for mothers and then fathers, taking into account potential contributions identified in models 1 and 2.

For mothers' Model 3: higher mothers' burden levels were explained by higher grief levels (ECI score, $\beta = -0.31$, $p = 0.01$) and worse child clinical state (MR-GOAS score, $\beta = -0.24$, $p = 0.03$).

The other variables were not significant: mothers' anxiety (HADS-anxiety score, $\beta = 0.10$, $p = 0.56$), depression (BDI score, $\beta = 0.03$, $p = 0.85$) and alexithymia levels (BVAQ score, $\beta = 0.02$, $p = 0.85$), as well as children's illness duration ($\beta = 0.15$, $p = 0.14$) were not linked with mothers' levels of burden. This model explained 24% of the variance ($R^2 = 0.24$).

For Fathers' Model 3: Fathers' higher burden levels were explained by higher grief levels (ECI score, $\beta = -0.35$, $p = 0.01$) and higher levels of anxiety (HADS-anxiety, $\beta = 0.34$, $p = 0.01$) but not by the other variables which were not significant: depression levels (BDI score, $\beta = -0.04$, $p = 0.71$) and child clinical state (MR-GOAS score, $\beta = -0.21$, $p = 0.01$). This model explained 34% of the variance ($R^2 = 0.34$).

Discussion

The aim of the study was firstly to explore burden and grief among parents of adolescents suffering from AN, in association with parents' and their children's characteristics. Secondly, we explored possible relationships between burden and grief in AN. The main findings were that parental burden and grief are linked to both children's worse clinical state and parental emotional distress; and burden is explained in both parents by parental grief and emotional distress.

This study considered mothers and fathers separately as they are known to have different emotional states and perceptions of their child [39]. Our results suggest the presence of important gender and parental role differences which have an impact on the level of expressed emotional distress. Differences between genders have already been shown in depression [40], anxiety [41] and alexithymia [42]. Recently, the Lancet Psychiatry also mentioned the importance of disaggregating findings by sex [43], a distinction which is already well established in the field of ED [17, 44].

Both parents expressed more grief when their child had a worse clinical state. Fathers' grief was related to their own levels of depression and anxiety, while mothers' grief was associated with their own levels of anxiety, depression and alexithymia. Levels of alexithymia were higher in fathers, but mothers related this emotional state more deeply to their own grief, resulting in a deeper feeling of loss for their child. The *normative male alexithymia* hypothesis could explain our results. Men are supposed to show the greatest deficits in identifying and expressing emotions that reflect a sense of vulnerability (hurt, sadness or fear) or express attachment [45]. Our results suggest that mothers might be more affected by their child's clinical state than by their own resulting psychological suffering, whereas fathers feel a higher burden related to their own anxiety. Finally, we found that burden was explained by grief in both parents, by anxiety in fathers, and by the child's worse clinical state in mothers.

Parental experiences of burden, distress and grief are known to generate dysfunctional responses to the child's illness [7, 10]. Adequate parental support needs to be grounded into a careful evaluation of these three dimensions. Support should include both individualized components based on gender and parental role differences, and parental components aimed at reinforcing the parental team. Individualized gender-specific support should take into account both shared parental burden and grief and the unique factors contributing to these experiences. Indeed, it is known that early phases of adaptation to a psychiatric illness can trigger or include a grief process that involves a high level of parental burden [21]. As a first step, therapists need to work specifically on parents' unique experience of loss of their former or ideal healthy child, using the concept of grief. Interventions may include a specific focus on the meaning and purpose of the illness for their child, and its possible (not necessarily hopeless) course. For example, helping each parent understand the illness as a needed constructive transition towards adulthood rather than as a useless illness could reduce the feeling of loss. More generally, taking time to help parents regain a sense of mastery and hope is extremely important. As a second step, it may be useful to work on parents' emotional distress. In this respect, while fathers need specific help in decreasing their levels of anxiety, mothers' experienced burden needs to be given priority, keeping at all times a systemic perspective on these unique experiences. Indeed, research suggests that fathers' attendance to family-oriented treatment is generally poor and even tends to decrease over time [49]. Therapists, and society in general, tend to accept fathers' absence from treatment, thus unwittingly reinforcing their marginalization and conveying to mothers the message that they are the main change agent (and perhaps the guilty one to start with). This trend is particularly marked in the field of ED and unfortunately reinforces mothers' feeling of burden [47]. Such vicious cycles can be worked on without blaming one or the other parent. The clinical and empirical literature offers ample evidence of the unique and very significant role fathers play in their adolescent daughter's recovery, including how their attendance to therapy is associated with improved treatment outcomes. This information can be relayed to fathers in order to improve their understanding of their daughter's difficulties and strengthen their motivation to join the family in its fight against the illness [48–50].

Gender-specific support can be provided in both individual therapy and in family-oriented approaches (i.e.: parent groups, single- and multi-family therapy). Parent groups and multi-family approaches are particularly well suited for this purpose as they provide a community of support and reflection for mothers and fathers in their respective roles, as well as opportunities for sub-group work along the same lines [51]. Family approaches also provide a useful framework for addressing broader grief issues, such as loss of a former family identity.

Strength and limits. The clinical implications of this research are crucial as there are few empirical guidelines for therapeutic practice in gender and parental role differences with regard to AN. However, our findings should be consolidated by more evidence in support of our clinical considerations.

Declarations

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Competing Interests. The authors have no relevant financial or non-financial interests to disclose.

Author Contributions. All authors contributed to the conception and design of the study. Material preparation, data collection and analysis were performed by Jeanne Duclos, Giulia Piva, Elise Riquin and Christophe Lalanne. The first draft of the manuscript was written by Jeanne Duclos, Elise Riquin and all authors commented on initial versions of the manuscript. All authors read and approved the final manuscript. Solange Cook-Darzens closely followed all the stages of the writing of the manuscript. Nathalie Godart supervised the all study from beginning to end.

Data Availability. All relevant data are within the paper. Jeanne Duclos and Nathalie Godart have full access to all the data in the study. The datasets analysed during the current study are available from the corresponding author on reasonable request. Christophe Lalanne takes responsibility for the integrity of the data and the accuracy of the data analysis.

Ethics approval. This study was part of a larger longitudinal multi-centered study named EVHAN (Evaluation of Hospitalization for AN, Eudract number: 2007-A01110-53, registered in Clinical trials). It was performed in line with the principles of the Declaration of Helsinki. The study protocol was approved by the Ile-de-France III Ethics Committee and the Commission Nationale de l'Informatique et des Libertés.

Consent to participate. Written informed consent was appropriately obtained from each participant before inclusion, and from the parents of the subjects who were under 18 years of age. All individual participants included in the study gave a written consent.

Consent to publish. The authors affirm that all individual participants provided informed consent for publication in this article.

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