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Heterogeneity of posttraumatic stress symptoms in bereaved children and adolescents: Exploring subgroups and possible risk factors

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ABSTRACT

Bereaved youths are at risk of developing posttraumatic stress (PTS), but there are large individual differences in presentation and severity of PTS symptoms among bereaved youths. The study sought to identify subgroups based on the distribution of self-rated loss-related PTS symptoms in a sample of 264 bereaved youths (aged 7–18). Based on latent class analysis, we identified three subgroups: no disturbance (37.9%), intermediate disturbance (39.0%) and pervasive disturbance (23.1%). Subgroups differed in PTS severity and symptom configuration. Specifically, avoidance was relatively more pronounced in bereaved youth with no and intermediate PTS disturbance, whereas emotional numbing was relatively more pronounced in bereaved youth with intermediate and pervasive PTS disturbance. Associations between subgroup membership, emotional stability and demographic and loss-related variables were also examined. Multinomial logistic regression indicated that youths in the pervasive disturbance subgroup reported lower emotional stability than youths in the no disturbance subgroup. Other variables were unrelated to subgroup membership. The study highlights the importance of considering the heterogeneity in PTS symptomatology in the diagnoses and treatment of loss-related traumatic stress in bereaved youth. Moreover, it underscores the need for further research on possible risk and protective factors involved in the maintenance and development of this traumatic stress.

1. Introduction

The death of a loved one is one of the most serious and common stressors that youths can experience (Alisic et al., 2008; McLaughlin et al., 2013). Apart from the fact that a loss may be experienced as traumatic and stressful, secondary stressors can occur as a result of the loss (e.g., seeing distress in family members; Kaplow et al., 2012). Although most children and adolescents respond resiliently to loss (Bonanno and Mancini, 2008), a substantial minority develops psychological problems (Melhem et al., 2011). For instance, bereaved youths are at risk of developing symptoms of depression (Melhem et al., 2008), prolonged grief (Melhem et al., 2013), and posttraumatic stress disorder (PTSD; Pham et al., 2018; Stoppelbein and Greening, 2000). The present study focused on posttraumatic stress (PTS), considering that the timely detection and treatment of traumatic stress in youth is important to prevent later impairments in learning, behavior, and both physical and psychological health (Shonkoff et al., 2012). Specifically, we explored the heterogeneity of patterns in PTS symptoms in bereaved children and adolescents. Moreover, we examined variables that might be related to these patterns.

The presentation and severity of responses to loss differ between youths (Melhem et al., 2011; Spuij et al., 2012). For instance, while some children and adolescents primarily experience symptoms of prolonged grief, others also experience PTS symptoms associated with circumstances of the loss (Boelen et al., 2017). According to the DSM-IV-TR (American Psychological Association [APA], 2000), PTSD encompasses symptoms of reexperiencing (e.g., intrusive thoughts), avoidance (e.g., avoidance of thoughts), emotional numbing (e.g., loss of interest), and hyperarousal (e.g., hypervigilance). In the current study, we evaluated DSM-IV based PTS and separated the avoidance and emotional numbing clusters, as many studies indicated that the factor structure of PTSD is best represented by four symptom clusters (e.g., Boelen and Spuij, 2013; King et al., 1998).

In 2013, the DSM-5 was released and the concept of PTSD has changed compared to the DSM-IV-TR. Remarkably, these changes were relatively marginal and both concepts of PTSD (i.e., DSM-IV-TR and

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DSM-5 versions) correspond with the current ICD-11 criteria (World Health Organization [WHO], 2019). Specifically, in the DSM-5, PTSD involves an extra symptom cluster "negative alterations to mood and cognition". This symptom cluster encompasses symptoms similar to the DSM-IV-TR emotional numbing symptoms (e.g., diminished interest in activities) but also other symptoms related to a negative mood and cognition (e.g., blaming oneself or others for the trauma). Moreover, in the DSM-IV-TR (APA, 2000) the death of a significant other is qualified as a traumatic event when the child or adolescent experiences intense fear, helplessness or horror. In contrast, in the DSM-5 (APA, 2013) the death of a significant other is only qualified as a traumatic event when the loss was violent or accidental. Notwithstanding this renewed criterium, there is evidence that also non-violent or non-accidental losses may lead to severe PTS in individuals (Anders et al., 2011; Mol et al., 2005), making it relevant to study PTS in bereaved youth who lost a loved one due to various causes.

Until now, little is known about patterns of PTS symptoms among bereaved youth. Therefore, the first aim of the study was to identify subgroups of bereaved youths sharing similar PTS symptom presentations, using latent class analysis (LCA; Geiser, 2012). Several studies examined the heterogeneity of DSM-IV PTS symptoms in individuals exposed to different traumatic events (Ayer et al., 2011; Breslau et al., 2005; Naifeh et al., 2010; Rosellini et al., 2014; Steenkamp et al., 2012), including bereaved adults (Lenferink et al., 2019). These studies identified two to four subgroups mainly varying in terms of PTS severity (e.g., low, intermediate and high disturbance). Interestingly, most of these studies also found that, compared to the other symptom clusters, the avoidance and/or emotional numbing symptoms were more pronounced in the higher severity subgroups compared to the lower severity subgroups (Ayer et al., 2011; Breslau et al., 2005; Naifeh et al., 2010; Rosellini et al., 2014; Steenkamp et al., 2012). This indicates that the subgroups not only differed in PTS severity, but, at least to some extent, also in symptom configuration. Other studies identified three or four subgroups that varied in PTS severity, but also varied qualitatively based on different PTS symptom clusters. For instance, these studies found subgroups differing in terms of the number of emotional numbing symptoms (i.e., intermediate disturbance plus low emotional numbing, intermediate disturbance plus high emotional numbing; Hebenstreit et al., 2014; Maguen et al., 2013), or avoidance symptoms (i.e., pervasive disturbance plus low avoidance, pervasive disturbance plus high avoidance; Böttche et al., 2015).

To our knowledge, the current study was the first to examine the extent to which these prior findings could be generalized to bereaved children and adolescents. Identifying PTS subgroups within bereaved youth is clinically relevant as it may inform assessment and treatment methods tailored to bereaved youth with different PTS symptom presentations (cf. Cloitre, 2015). Research on physical diseases shows that personalised treatments, tailored to variations in symptom presentations, yield better treatment outcomes (Institute of Medicine, 2011). Moreover, in clinical practice and research, the heterogeneity of PTS symptoms is often ignored, as the DSM system dichotomously categorizes people into those with or without PTSD (Galatzer-Levy and Bryant, 2013). As a result, youths with subclinical PTSD (i.e., meeting many but not all criteria for full-blown caseness) may be unrightfully labelled as “healthy”, while being possibly in need psychological support (Brancu et al., 2016). Importantly, if left untreated, subclinical PTSD may spiral into full-blown and possibly delayed onset PTSD (i.e., defined as PTSD with delayed expression in the DSM-5; APA, 2013; Cukor et al., 2010). Hence, it is relevant to examine if subgroups of bereaved youths experiencing subclinical levels of PTSD can be identified.

Based on prior evidence cited above (e.g., Ayer et al., 2011; Rosellini et al., 2014), we assumed that identifying three or four subgroups differing in PTS severity would be possible. Notwithstanding, most of the studies that identified three subgroups also found that, compared to the other symptom clusters, the avoidance and/or emotional numbing symptoms were more pronounced in the higher severity subgroups compared to the lower severity subgroups (Ayer et al., 2011; Breslau et al., 2005; Naifeh et al., 2010; Steenkamp et al., 2012). Therefore, we expected to find subgroups differing both in PTS severity and in the configuration of the avoidance and emotional numbing symptoms. More specifically, we expected to identify a subgroup with little or no disturbance, a subgroup with intermediate disturbance that is low on avoidance/emotional numbing, a subgroup with intermediate disturbance that is high on avoidance/emotional numbing, and a subgroup with pervasive disturbance.

A second aim of this study was to examine which factors were related to subgroup membership. We investigated the child’s or adolescent’s level of emotional stability and several demographic (i.e., gender and age of the child) and loss related factors (i.e., the cause of the loss, the perceived expectedness of the loss, the time since loss and the relationship with the deceased). Emotional stability (i.e., the opposite of neuroticism) is a central factors of personality (McCrae and Costa, 1999). Children and adolescents with lower emotional stability are more vulnerable to developing psychological disorders and often experience negative emotions, such as anxiety, depression, and irritability (Eysenck and Eysenck, 1964). Research among adults indicated that individuals with lower levels of emotional stability are more likely to experience PTS symptoms after a traumatic event (Boelen, 2021; Breslau and Schultz, 2013; Jakšić et al., 2012; Perrin et al., 2014) and show poorer adjustment after bereavement (Boelen and Klugkist, 2011; Robinson and Marwit, 2006; Wijngaards-de Meij et al., 2007). Possibly because individuals low in emotional stability are more likely to experience negative emotions and thoughts, which makes them more susceptible to develop negative cognitions and therefore more inclined to engage in avoidance after loss (Boelen et al., 2006). Accordingly, we expected that children and adolescents with lower levels of emotional stability were more likely to be classified into subgroups with more pervasive PTS symptoms. With respect to demographic variables, we expected that girls would be overrepresented in classes evidencing pervasive PTS, based on prior evidence that girls are more likely to develop PTSD after loss and trauma than boys (Spuij et al., 2012; Trickey et al., 2012). Due to contrasting or insufficient findings in earlier research, no hypotheses were formulated regarding the age of the child, the cause of the loss, the perceived expectedness of the loss, the time since loss and the relationship with the deceased.

2. Methods

2.1. Participants and procedure

In the present study, we used data collected for the purposes of two prior studies. A first sample of 103 children and adolescents was recruited via a grief support organization ($n = 83$) and an outpatient clinic at Utrecht University ($n = 20$). The data were collected as part of a study investigating the phenomenology and correlates of children’s grief. Data were gathered between mid-2007 and early 2009, in accordance with ethical guidelines applicable at the time. Children, adolescents, and parents who agreed to participate, completed questionnaires in the presence of either a therapist or a trained graduate student before they received any support or treatment. A second sample of 161 children and adolescents was recruited via several outpatient clinics in the Netherlands. The data were collected from 2010 through 2015 as part of a study evaluating cognitive-behavioural therapy for prolonged grief in youth (Boelen et al., 2021). The project was approved by the Medical Ethics Review Board (Central Committee on Research Involving Human Subjects NL30528.041.09). Youths (aged 7 to 18) meeting inclusions criteria (e.g., experiencing elevated prolonged grief disorder) completed questionnaires before and after treatment. In the current study, baseline data were used. Before the start of the data collection all children (aged 7–12 years) gave passive assent, and all parent(s) and adolescents (aged 13–18 years) gave active informed consent to participate.[1]

2.2. Measures

2.2.1. Demographic and loss related variables

We registered information about the participant's age and gender, the cause of the loss (categorized as due to illness, a violent cause [e.g., suicide, homicide, accident] or an unexpected medical cause [e.g., heart attack]), whether the loss was perceived as expected (categorized as yes or no), the time since loss (categorized as 1 year or less, 1 to 1.5 years, 1.5 to 2 years, 2 to 3 years, and 3 years or more), and the relationship with the deceased (categorized as mother, father, sibling, or other loved one [e.g., grandparent, uncle, aunt, cousin, friend]).

2.2.2. PTS symptoms

PTS symptoms were measured with the Child PTSD Symptom Scale-Self Report (CPSS-SR; Engelhard, 2005), a 24 item self-report questionnaire designed for children and adolescents aged 8 to 18 years. The index-event was defined as "the death of your loved one". In the current study, only the 17 items corresponding to the DSM-IV PTS symptoms were used (e.g., Feeling irritable or having fits of anger). Five items correspond to the reexperiencing cluster, seven items correspond to the avoidance/emotional numbing cluster, and five items correspond to the hyperarousal cluster. Participants rated on a 4-point scale how often they experienced each symptom in the past two weeks. For the present LCA, item scores were dichotomized. In line with earlier research (Boelen et al., 2017; Lenferink et al., 2019), scores 0=*not at all* and 1=*only once in a while* were considered as "symptom absent", and 2=*half of the time* and 3=*almost always* as "symptom present". The Cronbach's α was 0.90.

2.2.3. Emotional stability

Emotional stability was measured with the 16-item emotional stability subscale of the Hierarchical Personality Inventory for Children (Hi*P*IC; Mervielde et al., 2009). All items (e.g., "Has confidence in own abilities") were answered on a 5-point Likert scale with 1=*barely characteristic* to 5=*highly characteristic*. The Hi*P*IC is filled out by parents. In this study, 144 participants (54.5%) had a mother who filled out the Hi*P*IC, for 61 participants (23.0%) the father filled it out, and for 48 (18.2%) participants both parents filled out the Hi*P*IC. For the latter group, we randomly selected answers from one parent. The Cronbach's α's was 0.92.

2.3. Data analysis

First, descriptive and missing data analyses were performed in SPSS. Second, to investigate what subgroups could be identified based on the distribution of the PTS symptoms, an LCA was applied to the 17 dichotomized PTS symptom scores, using Mplus version 8.3 (Muthén and Muthén, 2017). We compared the most parsimonious one-class model to successive models with increasing numbers of classes. The optimal class solution was chosen based on several fit criteria. We evaluated the Bayesian information criterion (BIC; Bollen and Long, 1993), the Sample Adjusted Bayesian information criterion (SA-BIC), and the Akaike's information criterion (AIC), with lower values indicating better model fit. Moreover, we evaluated the Lo-Mendell-Rubin adjusted likelihood ratio test (LMR; Lo et al., 2001) and the bootstrap likelihood ratio test (BLRt; Langeheine et al., 1996), with significant *p*-values indicating a better model fit of the model under investigation compared to the model with one class less. Additionally, we evaluated the entropy R^2, with values closer to one indicating better model fit (Celeux and Soromenho, 1996). Furthermore, mean class probabilities larger than 0.80 indicated sufficient model fit. In the current study, the BIC and BLRt values were prioritized as they are considered the most robust parameters of LCA model fit (Nylund et al., 2007). Additionally, models with small class sizes (i.e., less than 5% of the sample size) and non-meaningful symptoms patterns were avoided (Collins and Lanza, 2010). Third, to interpret the underlying class structure, we evaluated the conditional probability estimates of symptom endorsement. In line with earlier studies (Lenferink et al., 2017, 2019; Maccallum and Bryant, 2019), we considered probabilities <0.15 as "low probabilities", probabilities from 0.15 through 0.59 as "moderate probabilities" and probabilities >0.60 as "high probabilities" of symptom endorsement. Fourth, we performed Welch's ANOVAs in SPSS to examine if the emerging classes differed in PTS severity and symptom configuration. Fifth, we calculated how many children and adolescents within each class met the symptomatic criteria for a probable DSM-IV PTSD diagnosis (i.e., endorsing at least one reexperiencing, three avoidance/emotional numbing, and two hyperarousal symptoms). Last, to investigate which factors were related to subgroups membership, a multinomial logistic regression was performed in Mplus (Muthén and Muthén, 2017). The classes were simultaneously regressed on emotional stability, age, gender, cause of the loss (dummy coded), perceived expectedness of the loss, time since loss (dummy coded) and relationship with the deceased (dummy coded), using the 3-step approach. In a 3-step approach, the predictors are added to the model after the latent classes are estimated and most likely class membership is determined. This approach is optimal as it considers the degree of classification uncertainty (Asparouhov and Muthén, 2014; Vermunt, 2010). To handle missing data, maximum likelihood estimation was used in all analyses.

3. Results

3.1. Descriptive and missing data analyses

The final sample included 264 children and adolescents aged 7 to 18 years (M = 12.50, SD = 2.90) who lost a parent, sibling or other significant loved one. Demographic and loss characteristics are presented in Table 1. We compared participants who completed all PTS items (n = 252) with participants with missing PTS items (n = 12) in terms of emotional stability, demographic, and loss-related variables, and PTS. Girls were more likely to have missing PTS items than boys ($\chi^2(1, 264) = 4.42$, $p = .036$). No other significant differences were found. The little's MCAR test showed that all data were missing completely at random ($\chi^2(1341) = 1377.73$, $p = .237$). Then, intercorrelations were calculated. Children and adolescents with higher levels of emotional stability reported less PTS symptoms, $r(252) = -0.14$, $p = .028$. Children and adolescents scored on average 3.18 (SD = 0.66; min. = 1, max. = 5) on parent-rated items tapping emotional stability and 0.87 (SD = 0.60; min. = 0, max. = 3) on the self-rated PTS symptoms.

Table 1
Demographic and loss characteristics of participants.

Characteristic	*n* (%)
Gender	
Boys	122 (46.2)
Girls	142 (53.8)
Deceased	
Mother	69 (26.1)
Father	132 (50.0)
Sibling	19 (7.2)
Other (e.g.,cousin, uncle, aunt, friend, grandparent)	44 (16.7)
Cause of the loss	
Illness	135 (51.1)
Violent (e.g.,accident, suicide, homicide)	54 (20.5)
Unexpected medical cause (e.g.,heart attack)	70 (26.5)
Perceived the loss as expected	
Yes	82 (31.1)
No	178 (67.4)
Time since loss	
1 year or less	59 (22.3)
1 to 1.5 years	28 (10.6)
1.5 to 2 years	43 (16.4)
2 to 3 years	39 (14.9)
3 years or more	93 (35.2)

3.2. Latent class analyses

The fit criteria for the one-class through five-class solutions are presented in Table 2. The BIC indicated that the three-class solution had the optimal model fit. The BLRt indicated that the four-class solution fit better than the three-class solution. Next, we compared these two models on the other fit criteria. For both solutions, the mean latent class probabilities were larger than 0.90, indicating sufficient model fit. According to the LMR, AIC, SA-BIC and entropy R^2, the four-class solution yielded a better model fit compared to the three-class solution, but differences in fit were marginal. Furthermore, the four-class solution contained a class with a small class size (n = 7, 2.7%) and a non-meaningful symptom pattern (shown in Fig. 2). Therefore, the three-class solution was retained.

To interpret the underlying class structure, we inspected the conditional probability estimates of the PTS symptoms (shown in Fig. 1 and Table 3). A first class (n = 100, 37.9%) had a low probability of endorsing all PTS symptoms and was labelled as the "no disturbance" class. A second class (n = 103, 39.0%) had a low probability of endorsing one reexperiencing symptom (i.e., flashbacks), two numbing symptoms (i.e., detachment and foreshortened future) and two hyperarousal symptoms (i.e., hypervigilance and exaggerated startle), and a moderate probability of endorsing the other twelve PTS symptoms. We labelled this class as the "intermediate disturbance" class. A third class (n = 61, 23.1%) had a high probability of endorsing three reexperiencing (i.e., intrusive thoughts, emotional reactivity, physical reactivity), one avoidance (i.e., avoidance thoughts), and four hyperarousal symptoms (i.e., disturbed sleep, irritability, difficulties concentrating, exaggerated startle), and a moderate probability of endorsing the other nine PTS symptoms. We labelled this class as the "pervasive disturbance" class.

3.3. Differences in PTS severity and symptom configuration between classes

Next, we investigated if classes differed in PTS severity. Table 4 shows the mean number of endorsed PTS symptoms in each class. Differences between classes in the total number of endorsed PTS symptoms signify differences in PTS severity. We found that classes indeed differed significantly in the total number of endorsed PTS symptoms (F(2, 118.51) = 647.75, p < .001). Games-Howel post-hoc tests revealed that endorsement was ordered such that pervasive > intermediate > no disturbance (all ps < .001).

Subsequently, we examined if classes differed in symptom configuration. Specifically, we tested whether there were differences between classes in the distribution of the PTS symptoms by its constituent symptom clusters. Table 4 shows the percentage of symptoms within each of the three classes that belong to a certain symptom cluster (for example, in the no disturbance class, 45.9% of the symptoms belong to the hyperarousal cluster, and only 2% to the emotional numbing cluster). If classes only differ in PTS severity, the distribution of symptoms across the symptom clusters would be similar. In contrast, if the percentage of symptoms belonging to a certain cluster differs across classes, classes also differ in symptom configuration.

The constituent part of the avoidance cluster differed significantly between classes (F(2, 98.77) = 7.51, p = .001); it was significantly greater in children and adolescents in the no disturbance and intermediate disturbance classes (28.9% and 14.8% of all symptoms in this class, respectively) than in children and adolescents in the pervasive disturbance class (10.1% of all symptoms in this class; ps < .05). Additionally, the constituent part of the emotional numbing cluster differed significantly between classes (F(2, 127.32) = 41.33, p < .001) and it was significantly greater in the intermediate and pervasive disturbance classes (22.1% and 23.6% of all symptoms in this class, respectively) than in the no disturbance class (2.0% of all symptoms in this class; ps < .001). No significant configural differences were found for the reexperiencing (F(2, 102.96) = 1.94, p = .149) and hyperarousal cluster (F(2, 101.53) = 1.02, p = .363).

3.4. Probable DSM-IV PTSD diagnosis

In total, 42 (17.8%) children and adolescents met symptomatic criteria for probable DSM-IV PTSD diagnosis. Within the no, intermediate, and pervasive disturbance classes 0%, 4.9%, and 68.9% of children and adolescents, respectively, met these criteria; percentages differed significantly between classes (χ^2(2, 264) = 142.09, p < .001).

3.5. Correlates of class membership

Last, to investigate if gender, age, the relationship with the deceased, cause of the loss, perceived expectedness of the loss, time since loss and emotional stability were related to class membership, a multinomial logistic regression was performed (Table 5). Children and adolescents in the pervasive disturbance class had lower emotional stability by parent report than children and adolescents in the no disturbance class. This was a small effect (OR = 0.95; Chen et al., 2010). We did not find other significant correlates of class membership.

4. Discussion

To our knowledge, this is the first study examining what subgroups could be distinguished among bereaved children and adolescents, based on their endorsement of symptoms of bereavement-related PTS. We identified three subgroups, representing bereaved children and adolescents with no PTS disturbance (37.9%), intermediate PTS disturbance (39.0%), and pervasive PTS disturbance (23.1%), respectively. The subgroups differed in PTS severity and in symptom configuration. More specifically, the avoidance symptoms were relatively most pronounced in children and adolescents with no and intermediate PTS disturbances, and the emotional numbing symptoms were relatively most pronounced in children and adolescents with intermediate and pervasive PTS disturbances. Furthermore, no one in the no disturbance subgroup, 4.9% of members of the intermediate disturbance subgroup, and 68.9% of children and adolescent in the pervasive disturbance subgroup met symptomatic criteria for a probable DSM-IV PTSD diagnosis. In addition, children and adolescents in the pervasive disturbance subgroup reported lower levels of emotional stability than children and adolescents in the no disturbance subgroup. The demographic and loss-related variables we considered were unrelated to subgroup membership.

Table 2
Fit criteria for the one to five class solutions.

Solution	AIC	BIC	SA-BIC	BLRt p	LMR p	Entropy R^2	Mean latent class probabilities	Smallest class size (%)
1 class	4844.39	4905.18	4851.28	–	–	–	1.0	264 (100)
2 class	4188.59	4313.75	4202.78	<.001	<.001	.86	.96	93 (35.2)
3 class	4107.28	4296.80	4128.77	<.001	.010	.81	.91	61 (23.1)
4 class	4087.40	4341.30	4116.19	<.001	.025	.84	.93	7 (2.7)
5 class	4084.20	4402.46	4120.29	.429	.454	.86	.93	7 (2.7)

Note. AIC = Akaike information criterion. BIC = Bayesian information criterion. SA-BIC = Sample-size adjusted Bayesian information criterion. BLRT = Bootstrap likelihood ratio test. LMR = Lo–Mendell–Rubin adjusted likelihood ratio test.

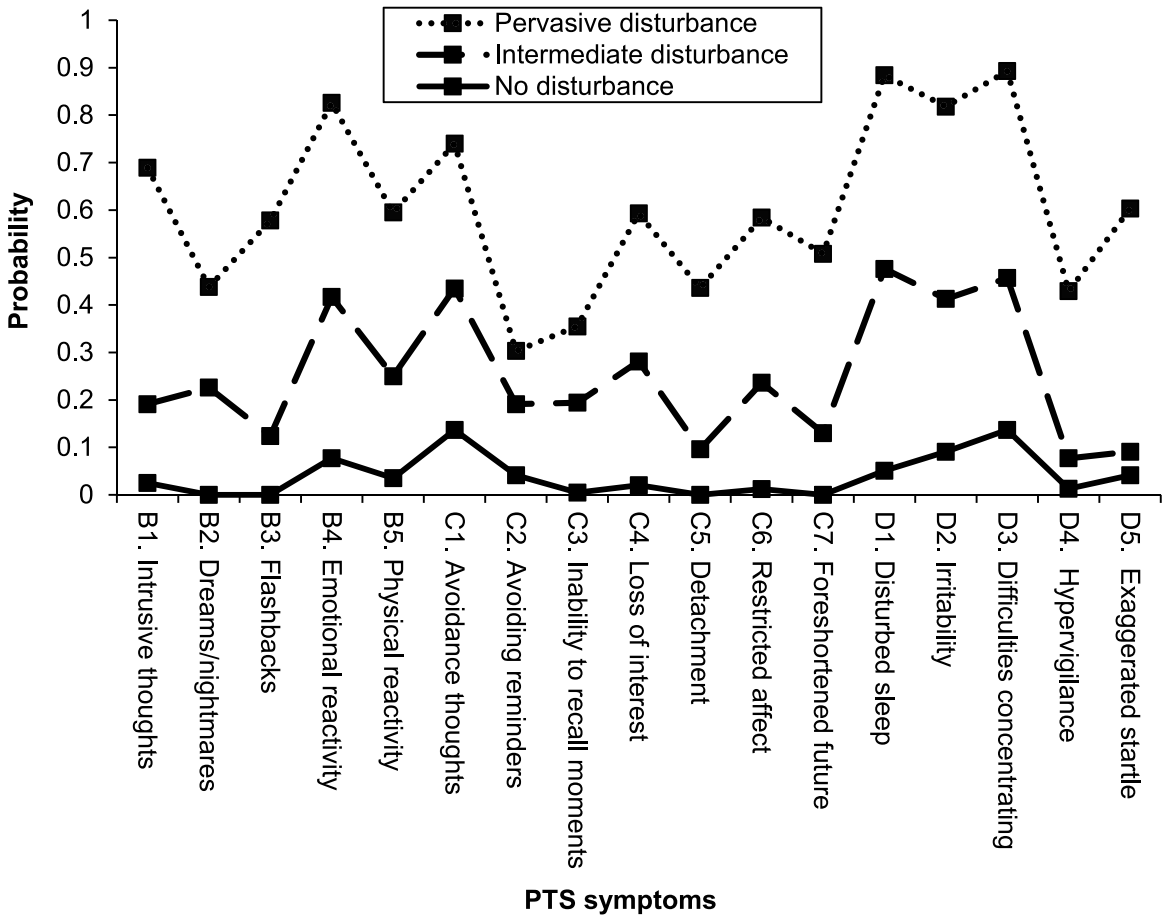

Fig. 1. Conditional Probability Estimates of the PTS symptoms for the Three-class Solution.

Based on prior studies (e.g., Ayer et al., 2011; Breslau et al., 2005; Naifeh et al., 2010; Rosellini et al., 2014; Steenkamp et al., 2012), we expected to identify three or four subgroups differing both in PTS severity and in the configuration of the avoidance and emotional numbing symptoms. More specifically, we expected that the avoidance and emotional numbing symptoms would be relatively most pronounced in the higher severity subgroups. Our findings are partly in line with this expectation. The three subgroups solution fitted the data better than the four subgroups solution, as the fourth subgroup contained only a small number of cases. We found that the three subgroups differed in PTS severity. This is consistent with prior research indicating that PTS is best represented by subgroups varying in severity (Ayer et al., 2011; Breslau et al., 2005; Lenferink et al., 2019; Naifeh et al., 2010; Rosellini et al., 2014; Steenkamp et al., 2012).

In addition, the three subgroups differed in the configuration of the avoidance and emotional numbing symptoms. However, unexpectedly, avoidance symptoms were relatively most pronounced in children and adolescents with no and intermediate PTS disturbance. This contrasts with studies in other traumatized samples which found the avoidance symptoms to be relatively most pronounced in the higher severity subgroups (Böttche et al., 2015; Steenkamp et al., 2012). Based on our finding, one might speculate that, after bereavement, avoidance coping might be not necessarily maladaptive. Particularly, bereaved children and adolescents are more limited in their use of adaptive coping strategies. For instance, problem-solving (i.e., changing the source of stress) is an adaptive coping strategy (Schäfer et al., 2017). However, this strategy cannot be used in the context of grief, as the loss cannot be made undone. Moreover, according to the dual process model of coping with bereavement (Stroebe and Schut, 1999), grieving individuals alternate between confronting and avoiding their grief-related thoughts and emotions. As the emotional pain associated with loss may be severe, temporarily distancing from grief-related thoughts, emotions, and stimuli might actually facilitate the grieving process. However, when avoidance coping is overused, it may become maladaptive as it precludes necessary cognitive and emotional processing of the loss (Shear, 2010). Another possibility is that children and adolescents who deliberately use temporal avoidance as an adaptive coping strategy are more aware of their avoidance behaviours than youths who persistently avoid grief-related stimuli in a maladaptive manner. Particularly, earlier research shows that individuals who use more adaptive coping strategies are more aware of their emotions compared to individuals who use less adaptive coping strategies (Barrett et al., 2001). Hence, it is possible that youths in the no and intermediate disturbance subgroups reported relatively more avoidance symptoms than youths in the pervasive disturbance subgroups, due to an increased awareness of their avoidance symptoms.

Additionally, as expected, emotional numbing symptoms were more strongly endorsed by children and adolescents with intermediate or pervasive PTS disturbance. This suggests that emotional numbing might be indicative of traumatic distress after loss. This accords with earlier research demonstrating that emotional numbing symptoms differentiate strongly between individuals with and without PTSD (Ayer et al., 2011; Breslau et al., 2005; Hebenstreit et al., 2014; Naifeh et al., 2010). However, we should be cautious with this conclusion as children and adolescents in the intermediate and pervasive disturbance subgroup could also have reported more emotional numbing symptoms because of comorbidity or overlap with other emotional disorders, such as depression or prolonged grief (Gros et al., 2012; Malgaroli et al., 2018).

Noteworthy, more than half of the children and adolescents were assigned to either the intermediate or pervasive disturbance subgroup

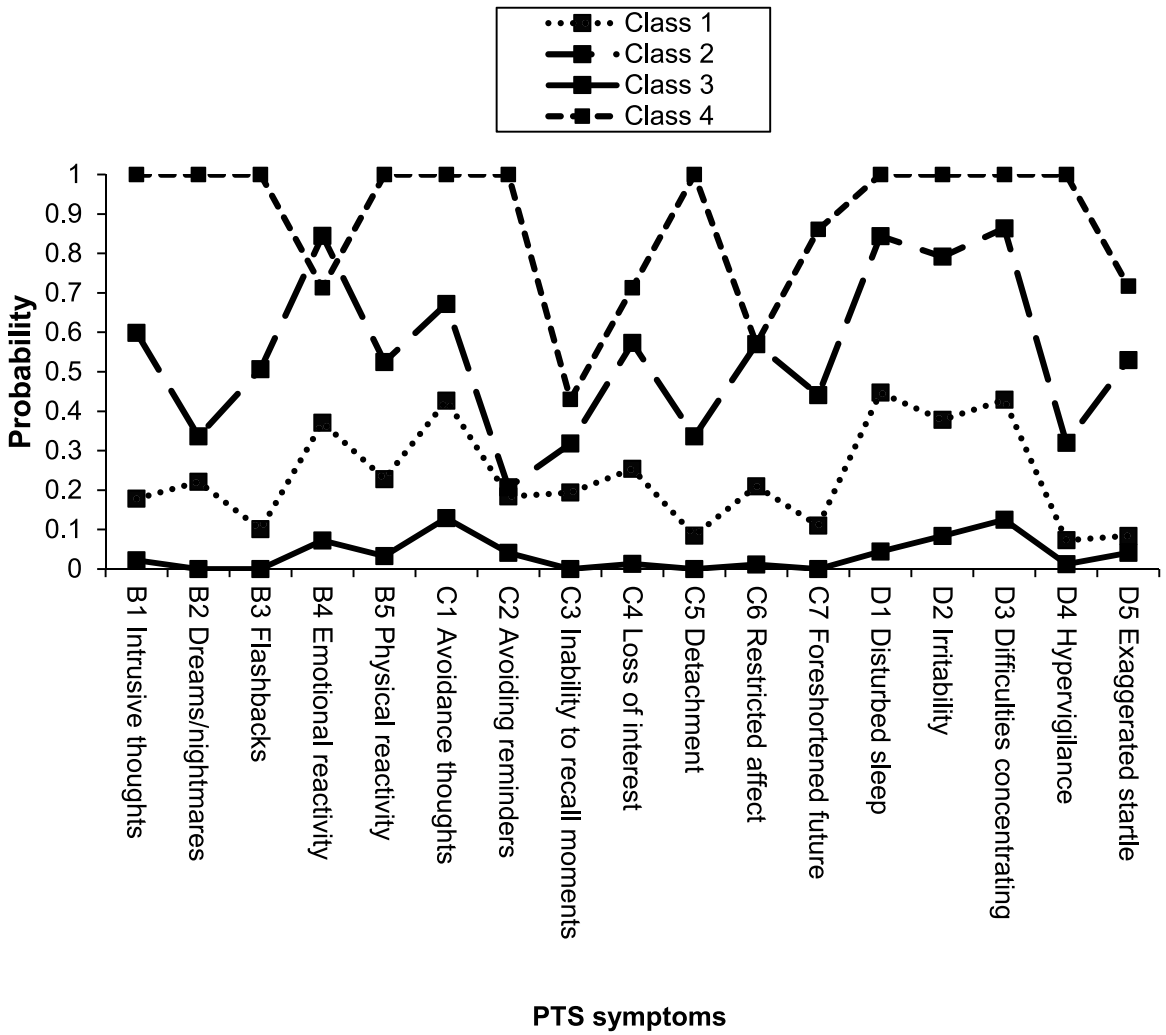

Fig. 2. Conditional Probability Estimates of the PTS symptoms for the Four-class Solution.[11]

(62.1%). Hence, most children and adolescents in this sample experienced considerable PTS disturbance. Although this rate should not be generalized to all bereaved youths, it suggests that PTS disturbances are present among those who seek help. However, only 4.9 percent of children and adolescents with intermediate PTS disturbance and 68.9 percent of children and adolescents with pervasive PTS disturbance met the symptomatic criteria for a probable DSM-IV PTSD diagnosis. This indicates that, among youths who do not have enough symptoms or the right combination of symptoms for a full (DSM-IV based) diagnosis of PTSD, a considerable number actually do experience intermediate or even pervasive PTSD symptomatology. These children and adolescents might be considered as having subclinical PTSD. Subclinical PTSD is often overlooked, which is problematic because it is associated with higher levels of depression, suicidality, and anxiety (Brancu et al., 2016). Moreover, if left untreated, subclinical PTSD may result into delayed onset PTSD (Cukor et al., 2010).

The study also investigated which factors were related to subgroup membership. As expected, children and adolescents in the pervasive disturbance subgroup reported lower levels of emotional stability compared to children and adolescents in the no disturbance subgroup. This is in line with earlier research indicating that decreased emotional stability predicts poorer adjustment after bereavement (Wijngaards-de Meij et al., 2007) and PTSD after different traumatic events (Breslau and Schultz, 2013; Jakšić et al., 2012). This suggests that emotional stability might be a protective factor for developing PTS after loss. However, we should be cautious with this conclusion as we only found a small association and do not know whether emotional stability was possibly affected by PTS symptoms. The demographic and loss related variables we considered were all unrelated to subgroup membership. Although this might seem surprising, there is little consensus in earlier research that these factors are associated with the development of PTS after loss (Melhem et al., 2008; Stoppelbein and Greening. 2000; Trickey et al., 2012). Our results suggest that the development of traumatic distress after loss might be more influenced by other factors, rather than by these static demographic and loss related factors. Indeed, a meta-analysis indicated that especially post-trauma factors such as, low social support, social withdrawal, poor family functioning, distraction and thought suppression were most strongly related to the development of PTSD after experiencing a traumatic event (Trickey et al., 2012).

There are some limitations that should be mentioned. First, the study relied solely on cross-sectional data. Therefore, we were unable to examine the stability or possible change in PTS subgroup structure over time. Additionally, no conclusions regarding the temporal order of emotional stability and PTS could be made. Second, the sample only consisted of children and adolescents who sought for some psychosocial support. This limits the generalization of our findings. Third, we do not know whether the psychological distress of the parents who in most cases were similarly exposed to the loss of a significant other affected the parent ratings of their child's emotional stability. Last, we assessed PTS symptoms as per DSM-IV. Therefore, our results may not generalize to PTS symptoms as defined in DSM-5. Moreover, according to the DSM-IV-TR (APA, 2000) the death of a significant other is qualified as a

Table 3
The overall symptom frequency and the conditional probability estimates of PTS symptoms for the three-class solution.

PTS symptoms	Overall symptom frequency		No disturbance class ($n = 100$)		Intermediate disturbance class ($n = 103$)		Pervasive disturbance class ($n = 61$)	
	n	%	Prob	*SE*	Prob	*SE*	Prob	*SE*
B1. Intrusive thoughts	63	24.0	.03	.02	.19	.05	.69	.10
B2.Dreams/nightmares	50	18.9	.00	.00	.23	.05	.44	.09
B3. Flashbacks	47	17.9	.00	.00	.12	.05	.58	.08
B4. Emotional reactivity	101	38.3	.08	.04	.42	.09	.83	.06
B5. Physical reactivity	65	24.8	.04	.02	.25	.07	.60	.07
C1. Avoidance thoughts	103	39.3	.14	.05	.44	.07	.74	.07
C2. Avoiding reminders	42	16.0	.04	.02	.19	.05	.30	.07
C3. Inability to recall moments	42	16.0	.01	.03	.19	.05	.36	.08
C4. Loss of interest	67	25.4	.02	.04	.28	.07	.59	.08
C5. Detachment	36	13.7	.00	.00	.10	.04	.44	.07
C6. Restricted affect	61	23.1	.01	.01	.24	.07	.58	.07
C7. Foreshortened future	44	16.7	.00	.00	.13	.05	.51	.08
D1. Disturbed sleep	108	41.1	.05	.04	.48	.07	.88	.06
D2. Irritability	101	38.4	.09	.06	.41	.08	.82	.06
D3. Difficulties concentrating	115	43.6	.14	.08	.46	.07	.89	.05
D4. Hypervigilance	35	13.3	.01	.02	.08	.03	.43	.09
D5. Exaggerated startle	49	18.6	.04	.02	.09	.04	.60	.10

Note. Prob = probability. PTS = posttraumatic stress.

Table 4
Mean number of endorsed PTS symptoms in each class, per symptom cluster and in total.

Symptom cluster	No disturbance class ($n = 100$) *M* (%)	Intermediate disturbance class ($n = 103$) *M* (%)	Pervasive disturbance class ($n = 61$) *M* (%)
Reexperiencing (B1-B5)	0.16 (23.0)	1.17 (26.3)	3.12 (30.3)
Avoidance (C1-C2)	0.16 (28.9)	0.65 (14.8)	1.05 (10.1)
Emotional numbing (C3-C7)	0.01 (2.0)	0.94 (22.1)	2.49 (23.6)
Hyperarousal (D1 -D5)	0.30 (45.9)	1.53 (37.0)	3.64 (36.1)
Total (B1 – D5)	0.63 (100)	4.29 (100)	10.29 (100)

PTS = posttraumatic stress.

traumatic event when the child or adolescent experiences intense fear, helplessness or horror. In contrast, according to the DSM-5 (APA, 2013) the death of a significant other is only qualified as a traumatic event when the loss was violent or accidental. This indicates that 79.5% of the children and adolescents within our sample would, by definition, not receive a DSM-5 PTSD diagnosis. Due to this DSM modification, possibly even less bereaved children and adolescents with substantial PTS disturbances receive a DSM diagnosis, whereas they might need psychological support.

Notwithstanding the limitations, the study had some important strengths. To our knowledge, it was the first examining the heterogeneity of PTS symptoms within a sample of bereaved youths. Moreover, it was the first studying emotional stability and demographic and loss related factors as predictors of latent PTS subgroups within bereaved youth. The study has some potential implications. While the DSM divides traumatized children and adolescents into two subgroups (no PTSD and PTSD), we identified three subgroups based on the distribution of bereavement-related PTS symptoms. This finding supports the use of a more dimensional approach, in which the severity of PTS is assessed instead of using a concrete threshold between no PTSD and PTSD. Additionally, in our sample, a substantial proportion experienced subclinical PTSD. As subclinical PTSD is related to negative outcomes, we suggest that more research into the diagnosing and treatment of subclinical PTSD is needed to prevent bereaved children and adolescent to develop delayed onset PTSD or other emotional disorders (Cukor et al., 2010; Brancu et al., 2016). Several interventions (e.g., CBT and EMDR) seem effective in preventing the development of PTSD and reducing PTS symptoms in children and adolescents recently exposed to trauma (Gillies et al., 2016). Moreover, the treatment effects of these psychological interventions do not seem to differ between youths with full and subclinical PTSD (Gutermann et al., 2016). Still, more research into this topic is needed. Possibly, youths with subclinical PTSD might, compared to youths with full PTDS, also already benefit from interventions that are preventative and less trauma-focused in nature, such as psychoeducational interventions, interventions aimed at strengthening social support from family members and others, and interventions that help to maintain normal functioning in different areas (e.g., school, sports, friendships). Furthermore, approximately 23% of the children and adolescents in our sample experienced pervasive PTS disturbance. For these children and adolescents, techniques targeting traumatic distress associated with circumstances of the loss (e.g., trauma focused cognitive behavioural treatments; Cohen et al., 2016) might be a beneficial addition to grief interventions. For children and adolescents

[1] We suspected that participants who were recruited via the grief support organisation ($n = 83$) had less severe psychological problems than participants who were recruited via outpatient clinics ($n = 181$). Therefore, these two groups were compared in terms of demographic variables, loss-related variables, PTS symptom clusters and emotional stability. Participants who were recruited via the grief support organisation differed from those recruited via outpatient clinics as they were younger ($t(262) = -5.71$, $p<.001$), scored higher on emotional stability ($t(250)=3.40$, $p=.001$), and reported less PTS hyperarousal ($t(262)=-2.24$, $p=.026$) symptoms. Moreover, they had less often a mother ($\chi 2$ (1, 264)=4.08, $p=.043$) or other loved one ($\chi 2$ (1, 264)=20.84, $p<.001$) who passed away, and more often a father ($\chi 2(1, 264)=24.06$, $p<.001$) who passed away. Furthermore, they less often lost a loved one due to illness ($\chi 2$ (1, 259)=10.68, $p<.01$), and more often lost a loved one due to an unexpected medical cause ($\chi 2$ (1, 259)=14.20, $p<.001$). Considering these findings, we decided to run the latent class analyses two times. A first time with adding the recruitment source as a covariate (i.e., 0= *outpatient clinic*, 1= *grief support organisation*) and a second time without adding this covariate. As the results of these two analyses only differed marginally, we decided to run the primary analyses without adding the recruitment source as a covariate.

Table 5
Multinomial logistic regression with class membership for the three-class solution regressed on socio-demographic and loss-related characteristics, and emotional stability.

Correlates	Intermediate disturbance versus no disturbance				Pervasive disturbance versus intermediate disturbance				Pervasive disturbance versus no disturbance			
	B	*SE B*	*p*	OR (95% CI)	*B*	*SE B*	*p*	OR (95% CI)	*B*	*SE B*	*p*	OR (95% CI)
Gender												
Girls[a]	−0.07	0.40	.860	0.93 (0.43–2.03)	−0.13	0.43	.765	0.88 (0.38–2.03)	−0.20	0.39	.613	0.82 (0.38–1.76)
Age	−0.09	0.07	.214	0.91 (0.79–1.05)	0.03	0.08	.751	1.03 (0.88–1.20)	-0.06	0.07	.370	0.94 (0.82–1.08)
Deceased												
Mother[a]	−0.72	0.69	.298	0.49 (0.13–1.88)	0.13	0.64	.835	1.14 (0.32–4.02)	−0.58	0.72	.421	0.56 (0.14–2.31)
Father[a]	−0.85	0.61	.171	0.43 (0.13–1.44)	0.38	0.59	.513	1.47 (0.46–4.65)	−0.46	0.63	.460	0.63 (0.18–2.16)
Sibling[a]	−0.23	0.93	.805	0.80 (0.13–4.91)	0.75	0.81	.357	2.11 (0.43–10.40)	0.52	0.84	.539	1.68 (0.32–8.78)
Cause of the loss												
Medical unexpected cause[a]	−1.01	0.61	.099	0.36 (0.11–1.21)	0.39	0.58	.503	1.48 (0.47–4.63)	−0.62	0.56	.296	0.54 (0.18–1.61)
Illness[a]	0.29	0.60	.632	1.33 (0.41–4.31)	−0.63	0.55	.256	0.53 (0.18–1.57)	−0.34	0.60	.569	0.71 (0.22–2.29)
Experienced the loss as unexpected												
Yes[a]	0.91	0.50	.072	2.47 (0.92–6.60)	−0.18	0.55	.737	0.83 (0.29–2.43)	0.72	0.54	.184	2.05 (0.71–5.03)
Time since loss												
Less than 1 year[a]	−0.57	0.55	.301	0.57 (0.19–1.66)	0.48	0.56	.392	1.62 (0.54–4.85)	−0.09	0.53	.870	0.92 (0.32–2.60)
1 to 1.5 years[a]	0.23	0.75	.761	1.26 (0.29–5.42)	0.37	0.70	.599	1.45 (0.37–5.72)	0.60	0.63	.345	1.82 (0.53–6.26)
1.5 to 2 years[a]	0.05	0.58	.926	1.06 (0.34–3.31)	0.09	0.62	.883	1.10 (0.32–3.71)	0.15	0.63	.818	1.16 (0.33–4.00)
2 to 3 years[a]	−0.33	0.61	.591	0.72 (0.22–2.37)	0.57	0.66	.387	1.78 (0.48–6.51)	0.25	0.60	.681	1.28 (0.39–4.16)
Emotional stability	-0.04	0.02	.071	0.96 (0.92–1.00)	−0.01	0.02	.615	0.99 (0.95–1.03)	−0.05	0.02	.018	0.95 (0.91–0.99)

Note [a] Indicator variable (i.e., dummy variable where the indicator category is coded as 1 and the other categories are coded as 0). OR = Odds Ratio.

with other grief-related symptoms (i.e., depression or prolonged grief) other techniques might be more applicable including cognitive behavioural interventions focused on reducing negative cognitions and maladaptive avoidance behaviours and developing adaptive coping skills (Boelen et al., 2021). Future research is needed to further examine the prevalence of, and treatment options for co-occurring PTS and other conditions following loss. In addition, that avoidance symptoms were relatively most pronounced in youth with no and intermediate PTS disturbance suggests that temporarily avoiding grief-related thoughts, emotions, and stimuli might sometimes be adaptive. Future research is needed to further examine this. Moreover, emotional numbing was only experienced by children and adolescent with intermediate or pervasive PTS disturbance. It would be interesting for future studies to investigate whether screening bereaved children and adolescents based on emotional numbing can predict which children and adolescents are most in need for treatments. Last, future research could examine if other factors (e.g., low social support and poor family functioning) rather than static demographic and loss-related factors might be risk factors of developing PTS after loss (Trickey et al., 2012). We suggest that low emotional stability might be a risk factor. Notwithstanding, prospective studies are needed to investigate if emotional stability is a protective factor of developing PTS after loss, and through which pathways emotional stability might influence bereavement outcome in youth.

To conclude, the study underscores the importance of considering the heterogeneity in PTS outcomes in the diagnosing and treatment of PTS in bereaved youth. Furthermore, it highlights the need for further knowledge about possible risk and protective factors involved in the maintenance and development of PTS symptoms after loss. This knowledge could help to improve treatments for children and adolescent who experience traumatic distress after loss. Moreover, in general, the study of emotional problems after loss is more and more relevant now that prolonged grief disorder has been included as an official disorder in both the DSM-5-TR (APA, 2022) and ICD-11 (WHO, 2019).

5. Contributors

Data were collected by P. Boelen and M. Spuij. J. Keulen performed the data analyses and interpretation under the supervision of M. Spuij, M. Deković, and P. Boelen. J. Keulen drafted the paper and M. Spuij, M. Deković, and P. Boelen provided critical revisions. All authors approved the final version of the paper for submission.

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Declaration of Competing Interest

All authors declare that they have no conflicts of interest.

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