Identifying child protection workers at risk for secondary traumatization: A latent class analysis of the Professional Quality of Life Scale–5

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Abstract
Secondary traumatization (ST) is a topical area among trauma-exposed employees, where many are at risk of occupational mental health problems due to their work with trauma survivors. Challenges related to the accurate operationalization of ST symptoms persist, and there is no valid method for identifying employees at risk of clinically significant symptom levels. This study aimed to test the applicability of latent class analysis (LCA) to identify employees at risk for clinically relevant ST symptoms. LCA was used to identify patterns of ST symptom endorsement using the Professional Quality of Life Scale–5 (ProQoL) in a national sample of Danish child protection workers (CPW; N = 545). Predictors and associated levels of distress and functional impairment across the symptom presentations were tested using regression analysis, and three classes were identified. A total of 3.8% (n = 21) of participants were at high risk of endorsing symptoms of ST that were associated with significant levels of distress and increased functional impairment. The LCA approach outperformed existing scoring procedures in differentiating between employees with varying levels of distress, impairment, and well-being. A minority of Danish CPWs are at risk for levels of ST that may be considered clinically significant for their associations with anxiety and social and cognitive impairment. Although the ProQoL is not a diagnostic tool, per se, a revised scoring procedure may render the measure useful when screening for employees who are at risk for levels of distress and impairment that require intervention.

The area of work-related traumatic stress has undergone substantial development over the past 10 years. A major milestone was the explicit recognition of indirect exposure to trauma as a potential source of traumatization among employees (American Psychiatric Association [APA], 2013). However, many gaps regarding the prevalence and consequences of indirect trauma exposure remain, and a recently published decennial review of research in psychotraumatology featured a call for future research that aims to clarify the conceptualization of traumatization following indirect exposure to potentially traumatizing material (Olff et al., 2019). Traumatization following indirect exposure to traumatizing material can lead to significant psychological distress and impairment, highlighting the need for effective screening and intervention strategies for this population.
exposure to potentially traumatic events, often referred to as “secondary traumatization,” describes symptoms resembling posttraumatic stress disorder (PTSD; Figley, 1995; see Newell & MacNeil, 2010, and Newell et al., 2016, for an overview of secondary traumatization and related constructs). Researchers have argued that there is a need for special efforts to protect employees’ occupational well-being in occupations that carry a risk of secondary traumatization (Molnar et al., 2021; Salloum et al., 2015). This need is echoed more broadly across recently published research agendas for advancing the science and practice relating to indirect trauma exposure (Sprang et al., 2019; Walsh et al., 2017). One agenda specifically encourages researchers to adopt a public health approach to mapping and preventing secondary traumatization (Molnar et al., 2017). The public health approach features four steps: (a) identifying the problem and its prevalence, (b) identifying risk and protective factors, (c) developing preventive initiatives and policies, and (d) evaluating and monitoring their effect over time (Molnar et al., 2017, 2020). Following this approach, a valid and reliable way of conceptualizing and identifying secondary traumatization is pivotal, as it is required to clarify the extent of the problem and develop and target future preventive efforts (Olff et al., 2019; Sprang et al., 2019).

Sprang and colleagues’ (2011) comparative study suggested that child protection workers (CPWs) may be a particularly high-risk group for secondary traumatization compared to psychiatrists and behavioral health professionals. Relatedly, a systematic review of secondary traumatization among CPWs aimed to address the first two steps of the public health approach for this professional group and found that the prevalence rate of secondary traumatization ranged from 16% to 92% across 39 studies (Molnar et al., 2020). The authors suggested that indirect trauma exposure is a ubiquitous challenge to CPWs, noting that most of the employees surveyed experienced at least some symptoms related to secondary traumatization (Molnar et al., 2020). The systematic review employed a broad definition of what is considered secondary or vicarious traumatization, namely “when there is a negative reaction to this witnessing of other people’s trauma, vicarious traumatization is the result,” and considered burnout, compassion fatigue, relationship-related and other difficulties manifestations of these potential negative consequences (Molnar et al., 2020, p 2). Adopting a broad definition aligns with the deliberately overinclusive approaches to identifying at-risk employees that was integrated into one of the most frequently used measures of secondary traumatization in the studies reviewed, the Professional Quality of Life Scale—5 (ProQoL-5; Stamm, 2010).

The ProQoL-5 is used to screen for symptoms of secondary traumatization using 10 items scored on a 5-point Likert-like scale, with responses summarized and scored directly (i.e., a raw-score approach) or transformed and scored using a t-score approach (Stamm, 2010). The cutoffs for both scores are purposefully overinclusive, as the measure is intended to be used as a screening tool, and, therefore, a score that indicates high risk cannot be treated as a threshold for clinically relevant levels of posttraumatic distress (Stamm, 2010). The ProQoL-5’s status as a screening tool is further underlined by the 10 included items, which provide inexhaustive coverage of PTSD symptoms. Both raw-score (Baugerud et al., 2018) and t-score procedures (Salloum et al., 2015) have been employed in the literature when reporting the number of participants in a high-risk group, thereby obscuring the comparability of prevalence rates across studies.

Due to the variability in ProQoL-5 scoring procedures and the inexhaustive list of PTSD symptoms of PTSD covered by the measure, as well as differences in sampling and study design, the prevalence of clinically relevant levels of secondary traumatic stress symptoms is still obscure. A similar concern was also raised in a review of the literature on secondary traumatization. Elwood and colleagues (2011) highlighted that clarification of the clinical relevance of the construct of secondary traumatization in terms of associated impairment and distress was an important step toward furthering the field of research in secondary traumatization. This step remains relevant today, particularly with respect to qualifying the discussion of the appropriateness of preventive initiatives modeled on a public health approach. Preventive initiatives may benefit relevant employees at risk for secondary traumatization, but large-scale preventive initiatives founded on prevalence rates that have been estimated based on overinclusive screening tools could negatively affect individuals and organizations working with trauma survivors. Screening tools with low specificity could contribute to a self-fulfilling prophecy of high levels of distress, and organizations could be required to channel their limited funding into secondary traumatization prevention initiatives that rely on an insufficient base of evidence to demonstrate their relevance (Elwood et al., 2011). The identification of symptoms of secondary traumatization that are associated with clinically significant levels of distress and impairment, as required for all other mental health diagnoses, is, therefore, still pivotal to ensure a precise mapping of the prevalence of secondary traumatization that can form a basis for the prioritization of larger-scale public health approaches to handling the risk of secondary traumatization.

Increasingly, latent class models are being used for diagnostic purposes in cases where there is no gold-standard diagnostic tool available (Myrseth & Notelaers, 2018; van Smeeden et al., 2013). Specifically, latent class analysis
(LCA) is a statistical method used to estimate the presence of unobservable homogenous groups based on patterns of item endorsement. Advantages of this approach include its ability to discriminate between different profiles of symptoms that may provide a useful heuristic in differentiating between employees at risk of secondary traumatization based on comparisons with other indicators of distress and functional impairment. Considering that the population of interest in the current study is a working population, indicators such as functional impairment, general well-being, and common mental health disorders would be helpful in identifying profiles of secondary traumatization symptoms that are associated with the risk to an employee’s well-being.

The aim of the current study was, therefore, to test the applicability of LCA to identify subgroups of Danish CPWs displaying symptom profiles of secondary traumatization that are particularly associated with impaired daily functioning and well-being. The identification of different symptom patterns and their associations with mental health constructs known to influence workability may be a useful first step toward providing useful insights when estimating the prevalence of secondary traumatization that may be considered clinically relevant. Specifically, we used LCA to identify participants as being at risk for symptoms of secondary traumatization compared with those identified using proposed cutoffs for ProQoL-5 raw and $t$-scores, as per the official manual (Stamm, 2010).

**METHOD**

**Participants and procedure**

Participants were recruited as part of an online nationwide survey of occupational well-being among CPWs in Denmark. Professionals across all municipal departments in Denmark working with children deemed vulnerable due to psychosocial circumstances (i.e., social workers, administrative staff, and supervisors) were eligible. A total of 98 departments were contacted. Out of these, 35 declined to participate, 22 did not reply, and the email was undeliverable for two departments, resulting in 41 (41.8%) participating departments. Individual employees were invited to participate in an online survey via an email distributed by the local departmental supervisors. The survey was reviewed and approved by the Ulster University Ethical Filter Committee. Data from this survey have been reported elsewhere (Vang et al., 2020; Skar et al., in press).

Across all departments, a total of 563 participants were recruited. Due to missing data, overall participation rates could not be calculated, and due to anonymization procedures, participants could not be nested within departments. The final sample was composed of four administrators, 19 supervisors, 443 social workers, and 81 employees in a function listed as “other,” including provided psychosocial services and interventions to children and families. Sixteen participants did not provide information on their professional roles. In total, 545 participants completed a measure of secondary traumatization, yielding an inclusion rate of 96.8%.

**Measures**

**Demographic characteristics**

Information was collected on age, sex (man, woman), marital status (single, married or cohabiting), and parental status (no children, children in household).

**Occupational strain and exposure to potentially traumatic case material**

Respondents were asked to indicate whether they had worked on a case that included suspected child physical or sexual abuse in the past month, whether they had worked overtime in the past month, and how many hours per week they were employed to work. In addition, respondents were asked to indicate how much time they spent, on average, working directly with vulnerable children or indirectly with case material about vulnerable children, respectively, on a Likert scale with response options of 1 (0%), 2 (1%–25%), 3 (26%–50%), 4 (50%–75%), 5 (76%–99%), and 6 (100%). Finally, they were asked to indicate the length of their current workplace experience on a 6-point scale ranging from 1 (less than 3 months) to 6 (10 years or more).

**Secondary traumatization**

Symptoms of secondary traumatization were operationalized using the 10-item Secondary Traumatization subscale of the ProQoL-5 (Stamm, 2010). Items on the ProQoL-5 are rated on a 5-point Likert scale ranging from 1 (never) to 5 (very often). Both raw scores and a transformed $t$-score approach can be used to indicate overall levels of secondary traumatization. When a raw scoring approach is used, scores below 22 indicate a low risk of secondary traumatization, and scores above 42 indicate a high risk; for the $t$ score approach, scores of 42 and 56 indicate low and high risk, respectively, reflecting the 25th and 75th respondent quartiles.
Symptoms of depression were assessed using the nine-item Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001), a self-report instrument that is used to measure the presence of depressive symptom levels over the past 2 weeks. Items are scored on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day), with scores summed to create a total score (range: 0–27). A score of 10 indicates moderate levels of depressive symptoms. The PHQ-9 has demonstrated good internal reliability (Cronbach’s $\alpha$ = .89; Kroenke et al., 2001). In the present sample, Cronbach’s alpha was .84.

### Anxiety

The self-report, seven-item Generalized Anxiety Disorder scale (GAD-7; Spitzer et al., 2006) was used to assess the presence of anxiety symptoms over the past 2 weeks. Items are scored on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day), with scores summed to create a total score (range: 0–21). Higher total scores indicate higher severity of anxiety, with scores of 10 and 15 indicating moderate and severe levels of anxiety, respectively. The GAD-7 has demonstrated excellent internal reliability (Cronbach’s $\alpha$ = .92; Spitzer et al., 2006). In the present sample, Cronbach’s alpha was .88.

### General well-being

The five-item WHO Well-Being Index (WHO-5; World Health Organization [WHO] Regional Office for Europe, 1998) is a measure of general well-being that has been validated in the Danish population (Bech et al., 2003). The scale was developed to allow clinicians and researchers to assess the presence of well-being rather than the absence of distress when evaluating mental health. Respondents are asked to rate the extent to which the content of each item applies to them over, using the past 14 days as a reference point. Items are scored on a 6-point Likert scale ranging from 0 (at no time) to 5 (all the time). For scale scoring, a linear composite is computed and multiplied by 4 to form an index ranging from 0 to 100. A general population mean of 68.7 ($SD = 19$) was used as a reference for the current study (Bech et al., 2003). In addition, scores that fell below 50 and 35 were used to indicate the possibility of a stress-related disorder and the likely presence of depression or a stress-related disorder, respectively (Bech et al., 2003). The scale has previously shown adequate internal consistency (Cronbach’s $\alpha$ = .84; Bech et al., 2003). In the present sample, Cronbach’s alpha was .89.

## Functional impairment

Functional impairment was operationalized using the Cognitive and Social Functional Impairment subscales of the WHO Disability Assessment Schedule (WHODAS; Üstün et al., 2010). Items are rated on a 5-point Likert-like scale ranging from 0 (none) to 4 (extreme or cannot do), with respondents using the past 30 days as a reference for their answers. The WHODAS can be scored using a sum-score approach where scores under each domain are added. The Cognitive subscale consists of six items, with a possible score range of 0–24, and the Social subscale consists of five items and has a possible score range of 0–20. Higher scores indicate higher levels of impairment. In the present sample, internal consistency was good for both the Cognitive, Cronbach’s $\alpha$ = .85, and Social subscales, Cronbach’s $\alpha$ = .83.

## Data analysis

Levels of secondary traumatization and the number of at-risk employees were calculated following recommendations outlined by Stamm (2010) for both the raw score and z-score approach. Then, LCA was conducted following the three-step approach (Asparouhov & Muthén, 2014). The three-step approach takes the probabilistic classification of individuals in an LCA into account when testing associations with predictors and outcomes. In the present study, the R3STEP was used to test the association between demographic predictors and class membership, and the DU3STEP approach was used to test the association between class membership and continuous outcomes in Mplus (Asparouhov & Muthén, 2014).

In the first step, an LCA was conducted to identify subgroups of participants with similar ProQoL-5 response patterns. Once individuals are assigned class membership, all systematic differences in their patterns of symptom endorsement are considered to have been accounted for, an assumption known as local independence (van Smeden et al., 2013). Items on the ProQoL-5 were dichotomized whereby scores of 1 and 2 were given a score of 0, indicating the absence of a symptom, and scores of 3–5 were given a score of 1, indicating the presence of a symptom. This mirrors the scoring procedure for the International Trauma Questionnaire (Cloitre et al., 2018), which assesses PTSD per the diagnostic criteria in the International Statistical Classification of Diseases and Related Health Problems (11th rev.; WHO, 2019). We assessed the fit of six models (i.e., a one- through six-class model), and model fit was estimated using robust maximum likelihood applying all available data for model estimation (Yuan & Bentler, 2000). To avoid solutions based on local maxima, 2,000 random
sets of starting values and 1,000 final stage optimizations were used. The relative fit of the models was compared by using parsimony corrected fit indices: Akaike information criterion (AIC; Akaike, 1987), Bayesian information criterion (BIC; Schwarz, 1978), and sample size–adjusted BIC (ssBIC; Sclove, 1987). The model that produces the lowest values can be judged as the best-fitting model provided classes differ qualitatively from each other (Debowksa et al., 2017). Additionally, the Lo–Mendell–Rubin adjusted likelihood ratio test (LMRT; Lo et al., 2001) and bootstrapped likelihood ratio test (BSLRT; McLachlan & Peel, 2000) were used to assess whether models with additional classes constituted a significant improvement in describing the data. A nonsignificant value (i.e., $p > .05$) suggests the model does not provide a description of the data that is statistically significantly better than the previous model. Finally, entropy was assessed on both a model-level and item-level basis (i.e., univariate entropy; Asparouhov & Muthén, 2016) to indicate the adequacy of participant classification. Entropy values range from 0 to 1.0, and values closer to 1.0 are indicative of better classification (Ramawamy et al., 1993).

Second, between-group differences for demographic characteristics across classes were tested using the R3STEP procedure in Mplus. For this analysis, the variables of workplace experience, direct work with children exposed to trauma, and indirect work with children exposed to trauma were entered as continuous variables, whereas the remaining demographic variables were entered as categorical variables. Chi-square analyses with adjusted residuals were conducted to assess within-group differences.

Third, the association between the latent classes from Stage 1 and indicators of mental health status was tested using the DU3STEP procedure. For comparison, we also assessed the mean difference for the outcome variables between risk groups following the t-score and raw-score approaches using the genlinmixed function in SPSS (Version 26) with the Satterthwaite approximation and robust estimation functions. All models were specified and estimated using Mplus (Version 8.1; Muthén & Muthén, 2011) and SPSS (Version 26).

**RESULTS**

Supplementary Table S1 displays sample characteristics. The mean raw score on the ProQoL-5 for the total sample was 17.1 ($SD = 5.2$, range: 10–42). Using the raw-score approach, most participants (86.1%, $n = 469$) scored in the low-risk range (i.e., a score of 22 or below), 13.3% ($n = 75$) scored in the moderate range (i.e., a score of 23–41), and only one participant (0.2%) scored in the high-risk range (i.e., a score of 42 or above). The raw-score high-risk group was, therefore, excluded from all subsequent analyses. Using the t-score approach, 18% of participants were found to be at low risk of secondary traumatization ($n = 98$), 51.4% were at moderate risk ($n = 280$), and 29.7% were at high risk ($n = 167$). Table 1 displays endorsement rates for each ProQoL item.

**Step 1: LCA**

Supplementary Table S2 displays the results of the LCA of symptom endorsement on the ProQoL-5. All models specifying two or more classes in the data exhibited a significant drop in AIC, BIC, and ssBIC-values, suggesting that there are qualitatively different patterns of item responses. Simulation studies have suggested that the BIC is the best indicator of goodness of fit, as it weights the model’s explanatory powers against its parsimony by heavily penalizing model complexity (Nylund et al., 2007). A difference in the BIC of 10 corresponds to “very strong” evidence in favor of the model with the more negative value (Raftery, 1995). The three-class solution displayed BIC values approximately 32 and 45 points lower than the two- and four-class solutions, respectively. The extra class represented a statistically significant contribution over the two-class model per the LRMT and BSLRT, and upon inspection of the profile plot, the additional class differed qualitatively from the remaining classes (Debowska et al., 2017). As the entropy value for the three-class solution remained above .80, this was deemed within an acceptable range. A latent profile analysis (LPA) of the variability in items on the ProQoL supported the selection of a three-class solution (see Supplementary Table S3 and supplementary Figure IS for details). Univariate entropy estimates across the LCA and LPA suggested that the most important items for differentiating between the classes were ProQoL-5 Items 9, 11, and 25. Taken altogether, the three-class solution was chosen as the best-fitting model. The average posterior probabilities ranged from .909 (Class 2) to .930 (Class 3).

The profile plot and probabilities for the three-class solution are shown in Figure 1, and the demographic characteristics of the classes are displayed in Supplementary Table S1. Class 1 was the smallest group, comprising 3.8% ($n = 21$) of the sample, and was characterized by the highest risk of endorsing all symptoms; this class was labeled the “secondary traumatization” class. Compared to the other groups, participants displayed an elevated risk of endorsing ProQoL-5 Items 13, 14, 23, and 25, which refer to experiences related particularly to clients’ traumatic experiences. Class 2 comprised 28.6% ($n = 140$) of the sample and was characterized by an elevated risk of endorsing Items ProQoL-5 2 and 11 and a moderate risk of endorsing Items 5, 7, and 9. As these items refer to overinvolvement in client work and hypervigilance, but not reexperiencing or
TABLE 1  Endorsement rates across Professional Quality of Life Scale—5 (ProQoL-5) secondary traumatization items

<table>
<thead>
<tr>
<th>ProQoL-5 item number</th>
<th>Content</th>
<th>n</th>
<th>%</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Preoccupied with more than one client</td>
<td>359</td>
<td>65.9</td>
<td>3.03</td>
<td>1.25</td>
</tr>
<tr>
<td>5</td>
<td>Jump or startled by unexpected sounds</td>
<td>95</td>
<td>17.4</td>
<td>1.69</td>
<td>0.98</td>
</tr>
<tr>
<td>7</td>
<td>Difficulty separating personal and professional life</td>
<td>114</td>
<td>20.9</td>
<td>1.82</td>
<td>0.98</td>
</tr>
<tr>
<td>9</td>
<td>Affected by others’ traumatic stress</td>
<td>106</td>
<td>19.4</td>
<td>1.79</td>
<td>0.93</td>
</tr>
<tr>
<td>11</td>
<td>“On edge” due to helping others</td>
<td>182</td>
<td>33.4</td>
<td>2.23</td>
<td>1.09</td>
</tr>
<tr>
<td>13</td>
<td>Depressed because of others’ trauma</td>
<td>37</td>
<td>6.8</td>
<td>1.40</td>
<td>0.68</td>
</tr>
<tr>
<td>14</td>
<td>Experiencing others’ trauma</td>
<td>16</td>
<td>2.9</td>
<td>1.14</td>
<td>0.50</td>
</tr>
<tr>
<td>23</td>
<td>Avoidance of reminders of others’ trauma</td>
<td>21</td>
<td>3.9</td>
<td>1.20</td>
<td>0.58</td>
</tr>
<tr>
<td>25</td>
<td>Intrusions of frightening thoughts due to helping others</td>
<td>36</td>
<td>6.6</td>
<td>1.30</td>
<td>0.68</td>
</tr>
<tr>
<td>28</td>
<td>Unable to recall important parts of work with trauma survivors</td>
<td>65</td>
<td>11.9</td>
<td>1.48</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Note: A score of 2 or higher was used to indicate symptom endorsement.

FIGURE 1  Profile plot of the three-class solution. Note: STS1: Preoccupied with more than 1 client. STS2: Startle. STS3: Difficulty separating personal/professional life. STS4: Affected by others’ traumatic stress. STS5: Tense/uneasy due to helping others. STS6: Depressed because of others’ trauma. STS7: Experiencing others’ trauma. STS8: Avoidance of reminders of others’ trauma. STS9: Intrusions of others’ trauma. STS10: Forgetting important parts of work with traumatized clients.

avoidance, this class was labeled “prodromal state.” Class 3 was the largest group, comprising 67.5% \( (n = 384) \) of the sample. This class was characterized by the lowest risk of endorsing all symptoms and displayed a moderate risk of endorsing ProQoL-5 Item 2. This class was labeled “low risk.”

Step 2: Associations with predictors

In the secondary traumatization class, most respondents were social workers (66.6%, \( n = 14 \)), with one supervisor (4.8%) and five employees with a job function listed as “other” (23.8%). Compared with the other classes, significantly fewer respondents in this class were married or cohabiting, \( \chi^2(2, N = 555) = 6.275, p = .043 \), adjusted residual = −2.4, or lived in a household with children, \( \chi^2(2, N = 555) = 13.30, p = .001 \), adjusted residual = −2.0. In the prodromal state class, most respondents were social workers (89.8%, \( n = 123 \)); the class also included one supervisor (0.7%) and 13 employees with a job function listed as “other” (9.5%). Compared with participants in other groups, those in this group were statistically significantly less likely to have children, \( \chi^2(2, N = 555) = 13.30, p = .001 \),
adjusted residual = –2.8. The low-risk class was composed of 303 social workers (79.5%), 16 supervisors (4.2%), and 59 employees with a job function listed as “other” (6.3%). Participants in this group were statistically significantly more likely to have children in their household, χ²(2, N = 555) = 13.30, p = .001, adjusted residual = 3.5.

Overall, the groups did not differ statistically significantly from each other with regard to demographic variables except that participants in the secondary traumatization class were significantly less likely to be married compared to participants in the low-risk group, and participants in the prodromal group were statistically significantly younger than those in the low-risk group. Results from the R3STEP analysis indicated that individuals in the prodromal class spent significantly more time working indirectly on cases with vulnerable children.

**Step 3: Associations with mental health and impairment outcomes**

Table 2 displays the results from the third step of the analysis, which investigated the associations between class membership and mental health status indicators. Overall, individuals in the secondary traumatization group displayed the most adverse profile across all mental health status indicators except for days of impairment, for which participants in the prodromal group reported numerically more days during which functional impairment had been present; however, this was not a statistically significant difference compared to the secondary traumatization group. Effect sizes for group differences varied between small (job satisfaction), moderate to large (cognitive impairment), and large (all remaining outcomes). Membership in the secondary traumatization group was associated with statistically significantly higher levels of anxiety compared with membership in the other groups, with average scores bordering on the cutoff for moderate anxiety, and significantly higher mean ProQoL–5 scores. The mean PHQ–9 score for participants in the secondary traumatization group only met the cutoff for moderate depression, although there was no statistically significant difference between the secondary traumatization group and prodromal groups. However, a total of 61.9% (n = 13) of individuals in the secondary traumatization group scored above the cutoff for moderate depression compared to 30% (n = 42) in the prodromal group and 9.1% (n = 35) in the low-risk group, χ²(2, N = 507) = 66.48, p < .001. Similarly, 38.1% (n = 8) of participants in the secondary traumatization group scored above the cutoff for moderate anxiety compared with 16.4% (n = 23) in the prodromal group and 3.9%
(n = 15) in the low-risk group, \( \chi^2(2, N = 507) = 45.89, p < .001 \). Participants in the secondary traumatization group also displayed statistically significantly more social and cognitive functional impairment compared to those in the low-risk group, whereas the secondary traumatization and prodromal groups did not differ statistically significantly from each other. The mean score for the WHO-5 General Well-Being scale was below the 35-point cutoff for the secondary traumatization group, suggesting the presence of long-term stress-related conditions or depression, whereas the prodromal group scored below the 50-point cutoff, indicating the need for potential screening for further mental health issues; the mean score for the low-risk group was above the 50-point cutoff indicative of general well-being. The prodromal group displayed elevated scores on all measures of mental health and functional impairment compared to the low-risk group and differed statistically significantly from both groups with respect to levels of anxiety and secondary traumatization compared with all other groups. Across all latent classes, when the raw-score approach was used, the ProQoL-5 mean score was above the low-risk cutoff for the secondary traumatization group only, whereas all groups score above the cutoff for low risk when the \( t \)-score approach was used. Both the prodromal and secondary traumatization group mean scores were above the high-risk cutoff when the \( t \)-score approach was used. Supplementary Table S4 displays the results from the analyses comparing groups based on the original cutoffs for both the raw and \( t \)-score scoring methods. A pattern emerged whereby the groups with higher ProQoL scores had significantly higher mean scores on all outcomes.

**DISCUSSION**

The aim of the current study was to test the applicability of LCA to identify participants at risk for self-reported significant levels of secondary traumatization using items from the ProQoL-5, a widely used measure of this construct (Cieslak et al., 2014; Molnar et al., 2020). The findings showed that the raw and the \( t \)-score approaches to scoring the ProQoL-5 (Stamm, 2010) produced different estimates of high-risk employees, varying between 0.2% and 29.7% in the current sample. The inconsistent use of these cutoffs in published literature limits the comparability and readability of the findings with regard to the prevalence of secondary traumatization in international literature. The \( t \)-score approach is useful for reflecting an individual's position relative to other participants in the same sample, but this procedure hampers comparability between studies that use the ProQoL-5 in different samples due to sample-specific variations in symptom severity and deviations from the normal distribution that are obscured when linear composites are transformed to \( t \)-scores.

The LCA and LPA findings suggest that the endorsement of secondary traumatization–related symptoms vary in interpretable and qualitatively different patterns that are obscured in employing the raw- and \( t \)-score approaches, which represent quantitative variation in items alone. Notably, when using the \( t \)-score approach, the high-risk cutoff did not differentiate between mean ProQoL scores in the secondary traumatization and prodromal risk groups. Following the LCA approach, however, a small group of 3.8% participants was found to endorse items that resemble core posttraumatic stress symptoms (i.e., ProQoL-5 Items 11, 23, and 25) as well as items uniquely related to indirect trauma exposure (i.e., ProQoL-5 Items 9, 13, and 14). This pattern was replicated using LPA but with fewer participants (2.6%) grouped in the secondary traumatization class. Previous research has found some of these symptoms (i.e., ProQoL-5 Items 9, 13, and 25) to be most strongly related to secondary traumatization when modeled as a latent construct (Geoffrion et al., 2019; Vang et al., 2020). This finding alludes to the possibility of more refined screening procedures that can be used when attempting to assess the prevalence of secondary traumatization. The utility of the different classification procedures in terms of identifying employees with potentially clinically relevant levels of distress is, however, partly determined by their associations with distress and functional impairment and partly by the theoretical meaningfulness of the profiles.

The groupings based on both raw and \( t \) scores differed significantly from each other in relation to the validated measures of mental health, functional impairment, and general well-being administered to participants. Taken together, the findings support the use of the \( t \)-score procedure for the purposefully overinclusive screening approach of the ProQoL-5 (Stamm, 2010). Notably, when \( t \) scores were used, the mean WHO-5 score for the high-risk group fell below the cutoff indicating that participants in this group required further assessment; however, mean depressive and anxiety symptom scores did not meet the cutoff requirements. For the moderate risk group, the mean raw PHQ-9 score for depressive symptoms almost met the cutoff, indicating a risk of reduced sensitivity when using cutoffs based on raw scores.

In comparison, the LCA groups showed more pronounced differentiation across associated indicators of distress, well-being, and impairment. For the WHO-5 measure of general well-being, the mean score for the low-risk group roughly corresponded with the Danish general population estimate (i.e., 63.24 vs. 68.7; Bech et al., 2003); the mean score for the prodromal group indicated a need for further assessment; and the mean score for the secondary traumatization was below the cutoff indicating the likely
presence of a depressive condition or stress-related disorder. Adhering to the raw-score approach, the mean scores for the low-risk class and prodromal classes placed both at low risk, suggesting a risk of overlooking employees who need to be further assessed when the ProQoL-5 raw-score approach is used for screening. Overall, the latent class approach was better than the raw- and t-score approaches at differentiating between employees who differed significantly from each other on important measures of distress and functional impairment.

The latent classes differed from each other in several important ways. The analysis revealed a large low-risk group, which is consistent with previous research suggesting most clinicians are at low risk for secondary traumatization (Elwood et al., 2001) and likely reflects that the current sample was drawn from a working population in which most individuals worked full-time. The smallest group was characterized by the highest risk of endorsing all symptoms as well as by the most adverse outcomes. Notably, this was the only group at risk of endorsing symptoms resembling core posttraumatic symptoms, particularly intrusion, avoidance, and hyperarousal (APA, 2013; Horowitz, 1983), supporting the identification of this minority group as secondarily traumatized.

An important current finding was the identification of a high-risk group and the differentiation between this group and a prodromal risk group. A prodromal state indicates that participants in this group may be at risk of fully manifesting symptoms of secondary traumatization in the future or may have been previously high-risk and currently in the process of recovering. Participants in the prodromal risk group were not deemed secondarily traumatized in the current study, as their profile was not characterized by reexperiencing or avoidance symptoms. Items characteristic for the prodromal class, including those reflecting a preoccupation with clients (ProQoL-5 Item 2) and difficulty separating private life and work life (ProQoL-5 Item 7), suggest concerns regarding overinvolvement at work, a well-known risk factor for general stress in classic occupational stress theory (Siegrist, 1996; Tsutsumi & Kawakami, 2004). The symptom profile for this group could, therefore, also indicate occupational stress and, thus, a class characterized by the risk of developing more severe burnout rather than secondary traumatization. Indeed, the overlap between secondary traumatization and burnout has been frequently discussed (see Cieslak et al., 2014, for a review). Findings from factor analyses of the associations between indicators and latent constructs of burnout and secondary traumatization support this interpretation, as items characteristic of the prodromal class were found to load onto both latent constructs in a previous study (Vang et al., 2020); importantly, this study was based partly on the same data as the current study, so variation could be sample-specific. However, other researchers have reported that ProQoL-5 Item 11, which was characteristically endorsed by the prodromal class, loads onto a general factor of professional quality of life with the strongest loading out of all secondary traumatization items (Geoffrion et al., 2019). On the contrary, observing the qualitative content of items reflective of the prodromal class, participants also endorsed items that are characteristic of traumatic stress (e.g., startle response; Zoladz & Diamond, 2013) and those reflecting a heightened response specifically related to trauma (ProQoL-5 Item 9). Although an underlying general stress response cannot be ruled out as an explanation for these symptoms, the increased endorsement of these two items reflecting traumatic stress could indicate that the prodromal class included employees showing early symptoms of secondary traumatization or, perhaps, those who were recovering from it. Longitudinal research is required to determine whether and under what circumstances individuals in the prodromal class may go on to develop secondary traumatization. The findings may also be indicative that arguments for dimensional models of psychopathology, as opposed to binary diagnostic categories, are applicable to the construct of secondary traumatization as well (Kotov et al., 2018).

Limitations to the current study include that data were cross-sectional and self-reported, thereby ruling out a state-of-the-art evaluation of at-risk status for clinically significant symptoms of secondary traumatization. The group size for the secondary traumatization group was small, and simulation studies have suggested that latent classes comprising less than 5% of a given sample might cause problems related to the stability and replicability of classes (Nylund et al., 2007). Future studies that test the stability of the class solution temporally and in other samples, with consideration given to the unequal distribution of professional roles within classes, are needed, and future studies would benefit from linking these tests more explicitly to the existing literature on posttraumatic stress symptoms.

The present findings suggest that in research studies using the ProQoL-5, LCA may be a viable alternative to identifying employees who are at risk of developing clinically relevant levels of secondary traumatization and that LCA performs better at differentiating between employees with different levels of well-being, mental health difficulties, and impairment than established cutoffs. For clinical practice, these findings suggest that scores of 2 or higher on ProQoL-5 Items 13, 14, 23, and 25 may be particularly helpful in identifying individuals who are at risk for clinically significant levels of distress. For organizations that employ CPWs in Denmark, the risk of secondary
traumatization appears to be notably lower compared to rates reported in international studies (Molnar et al., 2020). Employing the raw-score and t-score approaches yield rates of high-risk Danish CPWs that resemble those reported in Norway (0%; Baugerud et al., 2018) and the United States (29.8%; Salloum et al., 2019), respectively. This may reflect methodological shortcomings or actual differences across countries, as working conditions have been demonstrated to affect levels of secondary traumatization (Choi et al., 2011; Devilly et al., 2009). Comparative studies are needed to illuminate whether differences between countries can explain the observed variability in prevalence rates. With regard to future research, the findings suggest that LCA is a feasible and meaningful alternative to differentiating between at-risk groups when investigating secondary traumatization. Although differences in predictors across the latent classes were scarce in the current study, future research exploring risk and protective factors for the development of secondary traumatization across individual, case-related, and organizational factors may be aided by differentiating between groups of employees with qualitatively different symptom profiles.

OPEN PRACTICES STATEMENT

Neither of the studies reported in this article was formally preregistered. Neither the data nor the materials have been made available on a permanent third-party archive due to participant confidentiality; requests for the data or materials should be sent via email to the lead author at mlvang@health.sdu.dk.

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REFERENCES


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Additional supporting information can be found online in the Supporting Information section at the end of this article.