The Medical Somatic Dissociation Questionnaire Assessment for Childhood Sexual Abuse: A Brief Report

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**Abstract**

Child sexual abuse is a prevalent phenomenon worldwide. However, a gap exists between the incidence and disclosure rate, and assessment tools and techniques that can identify the source of symptoms are lacking. This study investigates the extent to which the validated Medical Somatic Dissociation Questionnaire (MSDQ) can differentiate between sexually and non-sexually abused children. A total of 794 children and youth between the ages of 8 and 18 (mean age: 12.2 (SD = 2.3); 42% female, 58% male) were recruited from the general population; other participants were residents of boarding schools and children who were referred to a medical center in Israel. The anonymous online questionnaire included queries about demographics, a condensed version of the Traumatic Life Events Questionnaire, and the MSDQ. Findings indicate strong internal consistency, reliability, incremental validity, and predictive validity of the instrument, indicating the superiority of the MSDQ’s ability to predict sexual abuse, physical abuse, or family member loss. It is concluded that the MSDQ can be integrated into the evaluation process performed by healthcare professionals in the diagnosis of minors with unexplained symptomatologies.

**Keywords:** Medical Somatic Dissociation Questionnaire, child sexual abuse, child abuse, validation.

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**Introduction**

Child sexual abuse (CSA) is a prevalent phenomenon worldwide. A recent epidemiological survey (Lev-Wiesel et al., 2018) conducted in Israel that included 12,000 individuals between the ages of 11 and 17 reported a prevalence of 18.7% in CSA among girls and boys. CSA is considered an extremely traumatic event that has severe and profound short- and long-term consequences (Iacono et al., 2021) on the victim’s physical and mental health (Hadanny et al., 2018). Although millions of children around the world experience CSA, the majority of victims delay disclosure of, or never disclose, the abuse (Hébert et al., 2009). Furthermore, findings show that the higher the severity of the abuse, the lower the willingness to report the incident (Jackson et al., 2015; Lev-Wiesel & First, 2018).

To date, three central assessment methods have been used to evaluate sexual victimization. The first is a forensic medical examination that should be conducted immediately after the incident of abuse (Adams et al., 2022; Lang et al., 2018). Because most alleged sexually victimized children’s cases are investigated long after the abusive event occurred, many forensic medical examinations yield no evidence (Everitt et al., 2012). The second assessment consists of an interview of the purported victim and administration of projective psychological tests that aim to evaluate the level of distress rather than its source (Morais et al., 2018). Hoft and Haddad (2017) showed that the forensic psychological interviewer’s report found the allegation of CSA credible in just 48 out of 103 cases (46.6%). According to judicial or criminal requirements, the third assessment, the child’s testimony, is considered unreliable (Block et al., 2013; Hershkowitz et al., 2018). At present, none of these assessments of sexual abuse (SA) in children or youth are sufficient to constitute a gold standard as an efficient screening tool for practitioners. Thus, there is a need to develop a practical tool that can assist professionals in detecting whether a child has experienced SA (Herrmann et al., 2014).

Previous studies have indicated that adult survivors of CSA show heightened levels of persistent dissociation compared to those with no history of CSA (Lev-Wiesel & Daphna-Tekoah, 2010). Research on adults has demonstrated that the validated Medical Somatic Dissociation Questionnaire (MSDQ) differentiates between adults who have experienced CSA and those who have not (Daphna-Tekoah et al., 2019). Therefore, the current study’s main objective is to adapt the MSDQ to children and youth and explore the extent to which the MSDQ may differentiate between sexually and non-sexually abused minors.

**Method**

*Participants and procedure*

Ethical approval was obtained from the Ethical Committee at Haifa University (no. 158/19), the Kaplan Medical Center (no. 0173-18), and the Ministry of Welfare (received 8.7.19). After parents signed a consent form enabling their children to participate (parents were requested to ask their children to provide verbal consent to participate), the children were approached by graduate students who, after preparation, explained the aims of the study to the participants (face to face or via Zoom/Facetime). The participants were then sent a link to their WhatsApp accounts or—if they resided in boarding schools or shelters for children at risk—given an iPad.

The participants included 794 children and youth between the ages of 8 and 18 (mean age: 12.2 (SD = 2.3); 42% female, 58% male) recruited from boarding schools, social welfare institutions, social work centers, and the Department of Children Emergency Medicine at Kaplan Medical Center. No incentive was offered by the research team.

An anonymous online questionnaire was administered via tablet computers. The questionnaire included the following measures: demographic-related queries (age and gender), a condensed version of the Traumatic Life Events Questionnaire (TLEQ), and the MSDQ. It is important to note that participants came from two diverse ethnic backgrounds (66% Indian; 34% Israeli Jewish).

*Measures*

*The Traumatic Life Events Questionnaire*

The TLEQ assesses experiences related to traumatic events (e.g., SA, accidents, and crime-related incidents) that are considered potential triggers of PTSD symptoms (Vrana & Lauterbach, 1994). Respondents provide information for each event experienced, as well as their age at the time of the event; items are measured on a 9-point Likert scale, with responses ranging from “not at all” to “severely/extremely.” The TLEQ has previously been used in Israel (Lev-Wiesel et al., 2009). In the current study, a condensed self-report version of the TLEQ was used that included six traumatic events: physical abuse, SA, car accident, loss of a family member, hospitalization or illness, and shooting or war. Participants were asked to indicate whether they had experienced any of the above events.

*The Medical Somatic Dissociation Questionnaire*

The MSDQ, developed and validated by Daphna-Tekoah et al. (2019), aims to evoke a possible history of child abuse and CSA, especially when survivors are unable or reluctant to disclose such history. The self-report questionnaire consists of 30 items, all of which are positive indicators of dissociation presented exclusively in behavioral terms with no reference to the words “somatic” or “dissociation.” The items cover all three categories linked to somatic dissociation: Somatization (Items: 1–5 and 7), Depression Symptoms (Items: 6, 8, 23–28, and 30), and Dissociative Manifestations (Items: 9–18 and 20). These items reflect elements of somatization, psychological distress, and dissociative states, respectively.

Responses were provided on a 5-point Likert-type scale, ranging from “not at all” (1) to “most of the time” (5). In previous studies (Daphna-Tekoah et al., 2019), the MDSQ has been found to have strong internal consistency, reliability, and convergent validity, with high correlations between the MSDQ and the Somatic Dissociation Questionnaire (Nijenhuis et al., 1996; SDQ-20), and between the MSDQ and the psychological symptomatology questionnaire (The Brief Symptom Inventory—18; Derogatis, 2001). Internal consistency (Cronbach’s alpha) for the entire MSDQ has previously been found to be 0.93. It has been translated into Arabic, English, and Hebrew. Internal consistency (Cronbach’s alpha) in the current study was 0.87.

[Insert Table 1 about here]

*Statistical analysis plan*

Demographic parameters were compared between the SA and non-SA abuse groups using the two-samples t-test or the chi-square test. Internal consistency reliability was determined using Cronbach’s alpha. Analyses were then conducted to establish the known-group, incremental, and predictive validities of the scale. Known-group validity was assessed by comparing participants reporting SA with those reporting only physical abuse, only family loss, no physical or SA, or no family loss. The comparison used one-way ANOVA. The *post hoc* pairwise comparison adjustment method used was Hochberg’s GT2.

The incremental validity of the MSDQ total score was assessed by comparing two prediction formulas for SA. The area under the ROC curve (AUC) and the Akaike information criterion (AIC), wherein the smaller the value, the better the fit, were selected for predictive and goodness-of-fit criteria, respectively. The AUCs of the two models were compared using the non-parametric approach of DeLong et al. (1988). The first prediction model consisted of the gender variable only. The second model used a gender predictor as the control for the MSDQ total score predictor.

The predictive validity of SA was assessed using the following techniques:

(1) using the train/test method, the 794-subjects dataset was randomly split into two sets: the training set (*n* = 555 [70%]) and the test set (*n* = 239 [30%]). The SA predictive model consisted of gender, and the total MSDQ score was applied to the training set. The quality of the prediction was then assessed on the test set using two predictive criteria: the AUC and the Brier score. For the AUC obtained, 0.60–0.75 indicates moderate-level predication accuracy; 0.75–0.90 represents good accuracy, 0.90–0.97 excellent accuracy, and 0.97–1.00 optimum accuracy (Swets, 1988). The Brier score is the weighted squared difference between the predicted probabilities and their observed response levels. The best possible Brier score is 0 for total accuracy, and the lowest possible score is 1, which means that the prediction was completely inaccurate; smaller scores (closer to 0) indicate better predictions (Brier, [1950](https://support.sas.com/documentation/cdl/en/statug/63962/HTML/default/statug_logistic_sect075.htm%22%20%5Cl%20%22brie_g_50)).

(2) The ROC technique was used to find an optimal cutoff point in the MSDQ score that would best differentiate between subjects who had experienced SA and those who had not. This cutoff point was chosen by point-maximizing the Youden function, which is the difference between the sensitivity rate and specificity rate over all possible cut-point values (Youden, 1950). Predictive validity was also assessed for participants who had experienced physical abuse (vs. those who had not experienced physical or sexual abuse) and family loss (vs. those who had not experienced physical or sexual abuse) in order to demonstrate the superiority of the MSDQ in predicting SA over other traumatic events. All analyses were performed using SAS for Windows version 9.4.

**Results**

*Demographic risk factors*

Table 2 presents the traumatic events reported by participants. The participants could identify more than one type of event experienced, where applicable. Comparing responses related to experiencing SA versus not experiencing SA revealed significant differences between genders, and it was found that the probability of experiencing SA was statistically significantly higher in males than in females (13% vs. 8%; p = 0.03).

[Insert Table 2 about here]

*Known-groups validity*

Table 3 shows a comparison of scale means between participants reporting SA, those reporting only physical abuse or only family loss, and those reporting none of these events. Participants who reported SA scored significantly higher compared to the three other groups, whereas no statistically significant difference was found between the three other reference groups.

[Insert Table 3 about here]

*Incremental validity*

Incremental validity was assessed by comparing predictive and goodness-of-fit criteria and the ROC curves of two models predicting SA. The first model consisted of the demographic significant univariate predictor: gender (male vs. female). The results show a significant male factor (OR = 1.7; p = 0.03), with an AUC of 0.56 and an AIC of 535. The second model added the total MSDQ score as an additional predictor. In this model, the total MSDQ score significantly predicted SA (OR = 3.6; p <.0001), as well as male (OR =1.9; p = 0.01). In the second model, the AUC increased to 0.70 and the AIC dropped to 498. A comparison of the ROC curves for the two models is presented in Figure 1; the p-value for comparison is <.0001, indicating a significantly higher AUC value when adding the MSDQ scale score to the demographic risk factor.

*Predictive validity*

The performances of the models predicting SA, physical abuse, and family loss developed on the training set and assessed on the test set are summarized in Table 4. Predictors of all abuse categories are gender and total MSDQ score. The test set’s predictive performances on SA resulted in an AUC of 0.73 and a Brier score of 0.08. The sample for predicting physical abuse and family loss did not include sexually abused participants. The AUC and Brier scores for predicting physical abuse are 0.62 and 0.22, respectively, and 0.68 and 0.16 for predicting family loss, respectively. These results show the superiority of the MSDQ as a predictor of SA over its predictive abilities of physical abuse or family member loss.

[Insert Table 4 about here]

Cutoff values of MSDQ scores that best differentiate between a participant who had experienced SA and one who had not according to ROC analysis were identified. When the total score is greater than or equal to 2, the possibility of correctly predicting SA is 51% (sensitivity), while specificity remains at 79% (when the total score is less than 2, there is a 79% chance of correctly predicting no SA).

[Insert Figure 1 about here]

**Discussion**

The rationale for applying the MSDQ to children and youth is that validated questionnaires commonly used in the field of SA and dissociation are typically applied as research tools and less commonly used in medical contexts.

Specifically, the main objective of the current study was to examine the extent to which the validated MSDQ differentiates between SA experiences and other traumatic events in children and youth, such as physical abuse or loss of a family member. Results revealed that the MSDQ is a relatively good predictor for CSA compared to physical abuse or loss of a family member. However, it does not differentiate between physical abuse and loss of a family member.

These findings seem to be consistent with earlier studies showing that persistent dissociation is significantly higher among CSA survivors (Chu & Dill, 1990; Putnam, 1993; Nelson et al., 2012; Van Den Bosch et al., 2003; Lahav & Elklit, 2016) than in survivors of other traumas. Moreover, individuals who had experienced repeated incidents of SA reported higher levels of dissociation than did those who had experienced a single incident (Arata, 2002). Recent research has shown that survivors of multiple traumas often exhibit higher levels of dissociation versus survivors of natural disasters and bereaved individuals (Hetzel-Riggin & Roby, 2013), which also corresponds with our findings.

Dissociation is a mental process that produces a lack of connection in a person’s thoughts, memories, feelings, actions, sensations, or sense of self. During the dissociation process, certain information is not associated with other information as it normally would be (Lev-Wiesel, 2004; Somer & Somer, 1997). Dissociation often serves as a defense mechanism for trauma survivors, and this often becomes embedded in the mental processes that shape a victim’s way of being in the world long after the traumatic exposure (Classen et al., 1993; Lahav & Elklit, 2016).

A novel questionnaire—in this case, the MSDQ—was created for use by practitioners in healthcare systems to support the process of assessing CSA patients with physiological symptoms. Because the possibility of a physical complaint—as an expression of somatic dissociation due to a history of abuse—can be part of medical anamnesis, the MSDQ was constructed as a practical measure suitable for use by practitioners, such as pediatricians, physicians, nurses, psychologists, and social workers specializing in child abuse. By facilitating the assessment of somatic dissociation, the MSDQ enables the practitioner to provide appropriate assessment and applicable treatment and to refrain from further medical evaluations that may be uncomfortable for the patient. Based on Nijenhuis et al.’s concept (1996) that dissociation is a psychoform and somatoform phenomenon, three different, yet interconnected, subscales were delineated: physical, psychological, and dissociative manifestations.

In contrast to Different from Daphna-Tekoah et al.’s earlier study (2019), which showed that MSDQ factors and the questionnaire’s total score differentiated between adult survivors of CSA and other CSA survivors, in the current study we used the total MSDQ score only. This decision was made since many participants were young (8–10 years old) and could not independently fill out the questionnaire. Although the MSDQ for adults and the MSDQ for children and youth include the same items, we added examples to some of the items to simplify it for young participants. A limitation of the study is that it did not consider how an outside influences, such as proximity to a parent, may have influenced the subjects’ answers.

 This study’s findings confirm the MSDQ’s usefulness as a primary notification tool for practitioners in detecting CSA. More specifically, the results show that the MSDQ can enable practitioners concerned about children or youth with psychological or physical distress that could indicate CSA to better detect past trauma. Moreover, the MSDQ can aid practitioners in evaluating children who exhibit somatic symptoms by including SA as a root cause of these symptoms. Without the ability to utilize validated screening tools indicating CSA, sexual trauma in children who suffer from symptoms of distress often goes undetected. Screening for trauma history and somatic dissociation symptoms can help health practitioners identify children and youth who are at risk of developing pervasive and severe traumatic stress symptoms. From the practical perspective of indicating the need for psychological or psychiatric intervention, the MSDQ has high specificity, and implementing a validated clinical assessment such as this may reduce unnecessary diagnostic interventions in medical contexts.

In conclusion, the MSDQ can be an essential tool for practitioners to detect CSA in children and youth who exhibit somatic symptoms.

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**Table 1**. Medical Somatic Dissociation Questionnaire (MSDQ)

|  |
| --- |
| 1. Stomachaches
 |
| 1. Constipation
 |
| 1. Chest pain or a feeling of suffocation or breathing difficulty
 |
| 1. Heart palpitations
 |
| 1. Sleep difficulties, nightmares, early rising
 |
| 1. Concentration difficulties
 |
| 1. Exhaustion or tiredness
 |
| 1. Anger tantrums or anxiousness
 |
| 1. Sense of paralysis
 |
| 1. Tickling in legs and hands
 |
| 1. Falling unexpectedly, physical instability
 |
| 1. Shaking, trembling, or dizziness
 |
| 1. Mouth dryness
 |
| 1. Physical dis-sensation
 |
| 1. Sight fogginess
 |
| 1. Planning to go one place but finding yourself in another place
 |
| 1. Feeling as if parts of your body have disappeared
 |
| 1. Feeling as if your body does not belong to you
 |
| 1. Leaving class without remembering what was learned
 |
| 1. Experiencing time as changing quickly or very slowly
 |
| 1. Intending to grab something but finding yourself grabbing something else
 |
| 1. Having a virtual friend
 |
| 1. Frequent mood changes
 |
| 1. Preference for being alone
 |
| 1. Tendency to be drawn toward sad things
 |
| 1. Feeling emotionally overwhelmed
 |
| 1. Tendency to become disappointed easily
 |
| 1. Desire to be more emotionally stable

(Items range from “not at all” = 1 to “most of the time” = 5) |

**Table 2.** Traumatic events statistics

|  |  |
| --- | --- |
| **Traumatic event** | **Overall (n = 794)** |
| Car accident, n (%) | 91 (11) |
| Physical abuse, n (%) | 396 (50) |
| Shooting or war, n (%) | 2 (0) |
| Illness hospitalization, n (%) | 188 (24) |
| Sexual abuse, n (%) | 84 (11) |
| Family member loss, n (%) | 272 (34) |

**Table 3.** Comparison of MSDQ means between groups of reference

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MSDQ | No sexual or physical abuse and no family loss n = 306 | Only familyloss, n = 153 | Only physical abuse, n = 251 | Sexual abuse,  n = 84 | p-value | Pairwise comparisons |
| Total |  1.73 (0.47)  |  1.68 (0.43)  |  1.74 (0.51)  |  2.12 (0.67)  |  <0.001  | d > a, b, c |

Note: a = no sexual or physical abuse and no family loss; b = only family loss; c = only physical abuse; and d = sexually abuse.

**Table 4.** Predicting performance of predicting sexual abuse, physical abuse, and family loss by gender and total MSDQ score

|  |  |  |  |
| --- | --- | --- | --- |
| **Dependent variable, n** | **AUC train, n**  | **AUC test, n**  | **Brier score test, n** |
| Sexual abuse, n = 794 | 0.69, n = 555 | 0.73, n = 239 | 0.08, n = 239 |
| Physical abuse, n = 710 | 0.64, n = 499 | 0.62, **n = 211** | 0.22, **n = 211** |
| Family member loss, n = 710 | 0.62, n = 499 | 0.68, **n = 211** | 0.16, **n = 211** |

**Figure 1**. ROC curves comparison of predicting sexual abuse



**Table 4**. Predicting performance of predicting sexual abuse, physical abuse, and family loss by gender and total MSDQ score

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Dependent variable , n** | **AUC train, n**  | **AUC test, n**  | **Brier score test, n** |  |
| Sexual abuse, n = 794 | 0.69, n = 555 | 0.73, n = 239 | 0.08, n = 239 |  |
| Physical abuse, n = 710 | 0.64, n = 499 | 0.62, **n = 211** | 0.22, **n = 211** |  |
| Family member loss, n = 710 | 0.62, n = 499 | 0.68, **n = 211** | 0.16, **n = 211** |  |