The Assessment of Childhood Maltreatment and its Associations with Affective Symptoms in Adulthood: Results of the German National Cohort (NAKO)

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Childhood Maltreatment and Affective Symptoms in the German National Cohort

Objectives: Childhood maltreatment affects 20-30% of the German population and is an important risk factor for physical and mental diseases in adult life. This study reports first results of the distribution of childhood maltreatment in the population-based mega cohort German National Cohort (NAKO) and estimates associations with affective symptoms in adulthood.

Methods: The Childhood Trauma Screener (CTS), a short version of the Childhood Trauma Questionnaire, was used in 83,995 adults (age: 20-72 years; 47.3% men) of NAKO. The five-item CTS assesses the severity of three types of childhood abuse and two types of childhood neglect.

Results: Overall, 21,131 participants (27.5%) reported at least one type of childhood maltreatment; 14,017 participants (18.3%) reported exactly one type and 250 participants (0.3%) reported all five types of childhood maltreatment. Small differences regarding age (mean absolute deviation around the mean (MAD)=0.47), sex (MAD=0.07) and education (MAD=0.82) were observed. The severity of childhood maltreatment was associated with more severe symptoms of depression (β=.23), anxiety (β=.21) and perceived stress (β=.23) in adulthood, validated particularly for emotional abuse and emotional neglect.

Conclusions: The distribution of childhood maltreatment in NAKO is similar to previous reports. Additionally, our results suggest differential associations with psychopathological symptoms for the five types of childhood maltreatment.

Keywords: German National Cohort; Childhood Trauma Screener; Depression; Anxiety; Stress

Introduction

Childhood maltreatment has been associated with an increased risk of multiple physical diseases in later life, such as respiratory and cardiovascular diseases as well as obesity (Danese & Tan, 2014; Hughes et al., 2017). It is also strongly related to mental disorders, – e.g., depression, anxiety disorders, and post-traumatic stress disorder – and even to an increased mortality risk (Chandan et al., 2020; Hughes et al., 2017; Nelson, Klumparendt, Doebler, & Ehring, 2017; Teicher & Samson, 2013). Childhood maltreatment affects about 20-30% of the German population (Witt, Brown, Plener, Brähler, & Fegert, 2017), and is one of the most important risk factors for physical and mental diseases in adult life (Hughes et al., 2017; Norman et al., 2012; Teicher & Samson, 2013).

Recent meta-analyses and reviews demonstrated that childhood maltreatment is associated with worse courses of mood, anxiety, substance abuse and psychotic disorders, including early onset, reoccurrence and chronicity, as well as worse treatment outcomes (Nanni, Uher, & Danese, 2012; Teicher & Samson, 2013; Thomas, Höfler, Schäfer, & Trautmann, 2019). Additionally, Spinhoven, Elzinga, van Hemert, Rooij, and Penninx (2016) showed in a longitudinal study that many psychogenic effects of childhood maltreatment may be mediated by maladaptive personality types, which might also negatively impact the treatment outcome. Thus, assessing childhood maltreatment before starting the psychological or psychiatric therapy of mental disorders might help to individualize and improve treatment.

For the short and economic assessment of childhood maltreatment, Grabe et al. (2012) has previously developed the Childhood Trauma Screener (CTS). The CTS is a short version of the self-report Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003). It uses five items to assess three types of childhood abuse (physically,

emotionally and sexually) and two types of childhood neglect (physically and emotionally). Importantly, each item is assessed on a five-point Likert Scale ("never true" - "very often true") enabling not only the assessment of absence or presence of the specific type of trauma but also the severity of traumatization (Grabe et al., 2012). First results demonstrated high correlations between the CTS and CTQ scores (r=.553-.880) and validated more severe childhood maltreatment in psychiatric patient samples (Grabe et al., 2012).

Many studies have been conducted to estimate the prevalence of childhood maltreatment both, world-wide and in different cultural communities. However, prevalence reports varied substantially, mostly due to methodological reasons such as the use of different assessment scales and different definitions of childhood maltreatment, sample sizes, age, sex or geographical region (Witt et al., 2017). Using data of the German National Cohort (NAKO; German National Cohort (GNC) Consortium, 2014) data freeze 100,000 (DF100K), the aim of the present study was to estimate the distribution of childhood maltreatment in the German general population. Childhood maltreatment was assessed by the CTS. The presence and severity of childhood maltreatment as well as the assessed types of abuse and neglect were evaluated. The estimated distribution as well as associations between the severity of childhood maltreatment and depression, anxiety and perceived stress in adulthood were used to validate the CTS.

Methods

Study Population

The NAKO is a population-based cohort study examining 205,000 randomly selected

participants in 18 study centres spread over 13 of the 16 Federal States of Germany aiming to investigate the cause of common diseases and their preclinical stages (German National Cohort (GNC) Consortium, 2014). Baseline examination took place between 2014 and 2019. A detailed description of the NAKO assessments has been published elsewhere (German National Cohort (GNC) Consortium, 2014). The present analysis includes data of the first 101,667 participants summarised in the NAKO DF100K (NAKO-399). NAKO inclusion criteria comprised an age range of 20-69 years. As assessments were partly delayed, the present study included participants between 20 and 72 years. Approval had been given by all study centers' local ethics committees and the study was conducted in accordance with the Declaration of Helsinki. All participants had provided written consent for study participation.

An overview of the assessment of neuropsychiatric functions and conditions is presented in the editorial article of this series (Berger, Rietschel, & Rujescu, submitted 2021), along with detailed analyses of specific neuropsychiatric measures, i.e. depressive symptoms (Streit et al., submitted 2021), anxiety and panic symptoms (Erhardt et al., submitted 2021) and cognition (Kleineidam et al., submitted 2021; Schmiedek et al., submitted 2021).

Participants who did not specify any native language and had not received an estimation of their German language skills by the study nurse (N=250) were excluded from our analyses. As the classification of job education has not been finalised at the time of data analyses, participants who were not yet classified according to the International Standard Classification of Education 97 were also excluded (N=8,925) ("International Standard Classification of Education, ISCED 1997," 2003; Dragano et al., 2020). The ISCED-97 categories were summarized to lower (ISCED-97 level 1/2), intermediate (ISCED-97 level 3/4) and higher (ISCED-97 level 5/6) education. Finally,

participants were excluded if any answer on the Childhood Trauma Screener items was missing (N=17,476; see below for more details).

Childhood Trauma Screener

The Childhood Trauma Screener (CTS; Grabe et al., 2012) is a five item short version of the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003). The CTQ uses 28 items to assess five subscales of childhood maltreatment: physical and emotional neglect as well as physical, emotional and sexual abuse. Grabe et al. (2012) used selectivity and difficulty coefficients as criteria to select one item for each subscale. All items are rated on a five-point Likert Scale ("never true" – "very often true"). A summary score of all items can be calculated with higher values indicating more severe childhood maltreatment. According to Bernstein et al. (2003), childhood maltreatment can be categorized as "none", "mild", "moderate" or "severe" on each subscale individually, often dichotomized to compare "none/mild" with "moderate/severe" childhood maltreatment (Häuser, Schmutzer, Brähler, & Glaesmer, 2011). Similarly, Glaesmer et al. (2013) defined cut-off values for the five CTS-items.

The CTS was assessed as part of the touchscreen section of the assessment. Please, see Berger et al. (submitted 2021) for more details. Since the touchscreen module was partially optional, a substantial number of participants answered not at all or only partly. Participants with at least one missing value on any of the CTS-items (n=17,476) were excluded from analyses. Of these, 99.5% (n=17,391) had no valid answer on any of the CTS items. Hence, the following CTS descriptions were based on 76,731 participants.

Affective Symptoms

To assess depression, responses to the nine items of the Patient Health Questionnaire 9

(PHQ-9; Kroenke, Spitzer, & Williams, 2001) were converted into a summary score (range: 0-27) with higher values indicating more severe depression symptoms. High validity and reliability of the PHQ-9 have been demonstrated by Kroenke, Spitzer, Williams, and Löwe (2010). Symptom severity was assessed for the past two weeks. The German version of the PHQ-9 was provided elsewhere (e.g. https://psydix.org/psychologische-testverfahren/phq-9/). Additionally, participants were asked if they received any treatment due to depression during the past twelve months. More detailed information on the PHQ-9 and depression treatment assessment in the NAKO is provided by Streit et al. (submitted 2021).

To assess anxiety, responses to the seven items of the Generalized Anxiety Disorder Scale 7 (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) were converted into a summary score (range: 0-21) with higher values indicating higher anxiety levels. High validity and reliability of the German version have been shown for the general population by Löwe et al. (2008). Symptom severity was assessed for the past four weeks. The German version of the GAD-7 was provided elsewhere (https://psydix.org/psychologische-testverfahren/gad-7/).

Finally, the ten items of the stress scale of the Patient Health Questionnaire (PHQ-Stress; Gräfe, Zipfel, Herzog, & Löwe, 2004) assessing psychosocial risk factors that may promote or maintain mental disorders were converted into a summary score (range: 0-20) with higher values indicating higher stress levels. Perceived stress was assessed for the past four weeks. The German version of the PHQ-Stress was provided elsewhere (https://www.wikiwand.com/de/PHQ-Stressmodul).

More detailed information on the GAD-7 and PHQ-Stress in the NAKO is provided by Erhardt et al. (submitted 2021).

Statistical Analyses

CTS Response Patterns. For each of the five CTS-items, percentages of each response were determined and compared with the results of earlier studies using the CTS in Germany (Glaesmer et al., 2013; Grabe et al., 2012). Grabe et al. (2012) have shown results for the sample used to develop the CTS, a general-population cohort, which has been sampled in the north-east of Germany. Results provided by Glaesmer et al. (2013) are based on a sample representative for the German population. To assess the severity of childhood maltreatment, means (M) and standard deviations (SD) were calculated for each item. Further, according to the categorization of Glaesmer et al. (2013), the percentages of participants reporting childhood maltreatment, childhood abuse and childhood neglect were estimated.

CTS-Item Correlation. To evaluate the associations of the five types of childhood maltreatment with each other as well as the CTS summary score, a Kendall's τ correlation matrix was calculated. According to Cohen (1988), $.1 \leq |\tau| < .3$ can be defined as a small, $.3 \leq |\tau| < .5$ can be defined as a medium, $.5 \leq |\tau| \leq 1$ can be defined as a large effect.

Childhood Maltreatment and Affective Symptoms in Adulthood. Linear regressions have been calculated to examine the association of PHQ-9, GAD-7 and PHQ-Stress summary scores in adulthood with any childhood maltreatment, childhood abuse and childhood neglect as well as the CTS-items and the CTS summary score. The aim was to evaluate if more severe symptoms of depression, higher anxiety levels or more perceived stress are associated with the experience of childhood maltreatment, childhood abuse or childhood neglect and to estimate if more severe symptoms were associated with more severe childhood maltreatment. All regression analyses have been adjusted for age, sex, education and study centre. Standardised regression coefficients

(β) were used to estimate the effect sizes. Further, differences between participants reporting treatment due to depression during the past twelve months and participants reporting no such treatment were calculated for any childhood maltreatment, childhood abuse and childhood neglect were estimated using Fisher's exact test. The same differences were estimated for the CTS items and the CTS summary score using two-sample t-tests.

Note that, as the sample size is very large, even very small effect sizes will reach statistical significance. Hence, we decided to focus on effects sizes rather than statistical significance. However, information on statistical significance is provided in the tables.

Results

Descriptive statistics for the used NAKO sample (N=76,731) are presented in Table 1.

Table 2 is presenting an overview of the percentages of participants reporting any childhood maltreatment, childhood abuse and childhood neglect categorized by age groups, sex, education, study centre, marital status, partnership, German as a native language and German language skills. M and SD for the CTS scores categorized by the same socioeconomic variables are presented in Table S1.

The mean absolute deviation around the mean (MAD) for the percentages of participants reporting any childhood maltreatment was largest for the education (MAD=9.4%) and the German language skills (MAD=10.1%). The MAD was lowest for sex (MAD=2.6%) and study centre (MAD=1.9%). These results were replicated by the CTS summary scores. For the study centres, the largest difference between the prevalences was about 8% (23.8%-31.8%) and about 0.5 points (M=7.08-7.63). between the mean CTS summary scores. For an overview of the MADs see Table 2 and Table S1.

CTS Response Patterns

The distribution of the responses to the five CTS-items as well as M and SD of each item are presented in Table 3. Note that the items for physical and emotional neglect are reversed items and, thus, the answer "never" is associated with the most severe neglect whereas the answer "very often" is associated with the most severe abuse. The responses summed up into the "maltreated" category are highlighted in grey in Table 3. The percentages of participants maltreated are presented.

An overview of the number of participants reporting none, or exactly one to five trauma is presented in Figure 1. At least one type of childhood abuse was reported by 13,004 participants (17.0%); at least one type of childhood neglect was reported by 12,693 participants (16.5%).

Supplementary Table S2 compares the estimated item responses of the NAKO sample with previously published responses in Germany (Glaesmer et al., 2013; Grabe et al., 2012).

CTS-Item Correlation

The correlation matrix between the CTS-items and the CTS summary score is presented in Table 4. All CTS-items representing five types of childhood maltreatment were associated with each other. There were small to medium correlations between sexual abuse and the other types of childhood maltreatment. The two types of neglect as well as emotional and physical abuse were moderately to strongly correlated. Interestingly, there also was a moderate correlation between emotional neglect and abuse but only a small correlation between physical neglect and abuse.

Childhood Maltreatment and Affective Symptoms in Adulthood

Associations of childhood maltreatment, childhood abuse and childhood neglect with

the PHQ-9, the GAD-7 and the PHQ-Stress summary scores in adulthood are presented in Table 5. Reporting any childhood maltreatment, childhood abuse or childhood neglect was associated with more symptoms of depression (any maltreatment: β=0.16, any abuse: β=0.19, any neglect: β=0.10), higher anxiety levels (any maltreatment: β=0.14, any abuse: β=0.17, any neglect: β=0.09) and more perceived stress (any maltreatment: β=0.16, any abuse: β=0.19, any neglect: β=0.09) in adulthood. Effect sizes were small for any childhood maltreatment and childhood abuse and very small for any childhood neglect. Associations of depression, anxiety and perceived stress in adulthood with the CTS-items and the CTS summary score are presented in Table 6. Again, small effect sizes were observed for all CTS-items and the CTS summary score. Very small correlations were observed with physical neglect, although statistically significant due to the large sample size. Finally, participants reporting treatment due to depression during the past twelve months were observed to have higher childhood maltreatment scores. Participants reporting any childhood maltreatment, childhood abuse or childhood neglect were more likely to report treatment due to depression during the past twelve months whereas participants without any childhood maltreatment, childhood abuse or childhood neglect were more likely to report no such treatment. The treatment-associated results are summarized in Table S3.

Discussion

Data of the NAKO DF100K was used to provide insights into the distribution of a history of childhood maltreatment in Germany and to analyse associations with depression, anxiety and perceived stress in adulthood. It has to be noted, that the proportions and mean values presented are based on the first 100,000 NAKO participants rather than the whole baseline sample and were not weighted for sex, age or

other characteristics. Thus, our numbers should not be interpreted as prevalence representative for the German population. However, contextualizing the results, we refer to previous population based studies below.

The analyses were based on the CTS, a five item screening tool for childhood maltreatment with each item assessing one type of neglect or abuse. Overall, CTS responses observed within the NAKO sample are similar to those reported by Glaesmer et al. (2013). Slightly lower maltreatment severity was reported by Grabe et al. (2012). Only small effect sizes were observed for the association between childhood maltreatment and all symptoms included.

The correlation matrix of the CTS-items was in line to previously published correlation matrices of the CTQ subscales (Iffland, Brähler, Neuner, Häuser, & Glaesmer, 2013). Compared to childhood abuse, prevalences and long-term effects of childhood neglect are studied far less, especially in low-income countries (Stoltenborgh, Bakermans-Kranenburg, & van Ijzendoorn, 2013; Wegman & Stetler, 2009). Although Newberger and Cook (1983) reported lower parental awareness of behaviour defined as desirable - by themselves, the child or the society - in parents whose children experienced childhood abuse or childhood neglect, effects were smaller for neglect than abuse. However, studies investigating independent effects childhood abuse and childhood neglect on adult health are rare (Wegman & Stetler, 2009).

In our study, the severity of emotional neglect was highly correlated with the severity of emotional abuse. In contrast, the correlation between physical neglect and physical abuse was much smaller. Reporting even larger effect sizes, Spertus, Yehuda, Wong, Halligan, and Seremetis (2003) also observed the largest correlations between emotional neglect and emotional abuse (r=.72) and a strong impact of emotional childhood maltreatment on physical and mental health symptoms that exceeded

associations of other types of maltreatment with these symptoms. This is in line with our own results demonstrating large correlations between emotional abuse or neglect in the childhood and symptoms of depression, perceived stress and anxiety symptoms in the adulthood.

Hence, research on the differential impact of childhood maltreatment on later affective symptomatology might benefit from additionally focusing on the content-related type of maltreatment (emotional vs. physical vs. sexual) and rather than on the qualitative type (abuse vs. neglect) only. Supporting this suggestion, sexual abuse yielded the lowest, but still substantial inter-item-correlations with other CTS-items and with the CTS summary score. For both the CTS and its longer version CTQ, similar correlation patterns for sexual abuse have been reported before, including smallest correlations of sexual abuse with childhood neglect and large correlations with the summary score (Bernstein et al., 2003; Grabe et al., 2012; Klinitzke, Romppel, Häuser, Brähler, & Glaesmer, 2012). Moreover, the proportion of affirmative answers to the sexual abuse CTS-item in the NAKO in our study is comparable with previous reports (Glaesmer et al., 2013; Grabe et al., 2012; Klinitzke et al., 2012).

Compared to the sample used by Grabe et al. (2012) to develop the CTS, the distribution of the item responses in the NAKO-sample was more similar to the prevalence of a general-population sample previously reported by Glaesmer et al. (2013). Both samples were similar to the NAKO sample in this study regarding age and sex distribution. However, Glaesmer et al. (2013) used data of 2,500 participants, representative for the German general population regarding age, sex and geographic region. Grabe et al. (2012) used data of the third wave of general-population cohort sampled in the north-east of Germany. Confirmatively, previous research showed regional differences in the prevalence rates of childhood maltreatment (Viola et al.,

2016; Witt et al., 2017). Nevertheless, only small differences between the study centres could be validated in the NAKO DF100K sample. In a recent-meta-analysis based on 288 studies from six continents, Viola et al. (2016) observed the lowest prevalence for Europe, Asia and Oceania. However, the question if there are also regional differences in the distribution of childhood maltreatment on an intracontinental or even national level has not been investigated so far. Viola et al. (2016) demonstrated a huge dominance of studies in North America and Europe. Here, we used the data of the NAKO DF100K to investigate potential differences across the study centres. Our data has revealed small differences between the study centres in the proportion of participants reporting childhood maltreatment. Thus, at least for the participants of the NAKO so far, small differences within Germany including urban and rural study centres could be identified.

Similar to previous studies, earlier birth cohorts have been associated with more severe childhood maltreatment, especially childhood neglect (Witt et al., 2017). Additionally, more severe emotional and sexual abuse in the childhood has been reported by women than by men (Witt et al., 2017), also in our data. Overall, severity of childhood maltreatment was low in the present NAKO data with lowest severity values for sexual abuse. Besides, Witt et al. (2017) described associations between more severe childhood maltreatment and lower education. In our data, these associations were most pronounced for lower education (ISCED-97 level 1/2) with only minor differences between intermediate and higher education (ISCED-97 level 3/4 and 5/6, respectively). Nevertheless, employment status and household income were not taken into account in the present study; these should be considered in future research.

In line with previous research, more severe childhood maltreatment has been associated with more severe symptoms of depression in adulthood, especially for

emotional neglect and emotional abuse (Nelson et al., 2017; Spertus et al., 2003). Similar associations have been observed for perceived stress. Multiple studies have demonstrated more severe symptoms of depression in persons feeling more stressed (Hammen, 2005; Park et al., 2019). Furthermore, depression and anxiety disorders are highly comorbid (Essau & La Torre-Luque, 2019; Kessler, Zhao, Blazer, & Swartz, 1997; Teicher & Samson, 2013). Thus, as expected, the effect sizes of the association between childhood maltreatment and symptoms of depression were very similar to the effect sizes of the associations between childhood maltreatment and anxiety symptoms in our data. Although the associations between anxiety disorder and childhood maltreatment are generally not a research focus (Rehan, Antfolk, Johansson, Jern, & Santtila, 2017; Teicher & Samson, 2013), previous observations match our own results. Thus, especially more severe childhood abuse was associated with more severe symptoms of anxiety.

Our study results are based on a large sample of the German population sampled over 18 study centres. The present study is based on the DF100K rather than the whole NAKO sample, which includes another 100K participants with a slightly younger average age. Nevertheless, the huge sample size within the present study leads to significant results even in the presence of minimal effects. Here, we focused on the description and validation of the CTS data. The CTS is a very short questionnaire aiming to screen for childhood maltreatment. The CTS does not provide information about the age at childhood maltreatment. Further, the information is self-reported and retrospective which might distort the response patterns. Finally, selective participation might limit the generalizability of the results, particularly in regard of the response rate of ~18% (Schipf et al., 2020). Beside the individuals who rejected to take part in the NAKO study, 17,391 participants did not answer any CTS-item and we can only

speculate on their reasons. Moreover, the psychopathology of the participants might impact the ability or willingness to remember and report childhood maltreatment. Although affective symptom severity was low in the present study, these potential confounders should be included in future, content-related research. The PHQ-9 and PHQ-Stress comprised the symptom severity of the past two and four weeks, respectively, which equals the standard period and thus makes our results highly comparable to previous studies (Gräfe et al., 2004; Kroenke et al., 2010). However, the GAD-7 comprised the symptom severity of the past four weeks in NAKO, which extends the standard period by two weeks. Nevertheless, the mean symptom severity did not substantially differ from mean symptom severity in the general population reported for two weeks (Löwe et al., 2008).

The present study estimated the distribution of childhood maltreatment in Germany. Overall, 27.5% of the participants reported at least one childhood maltreatment. Strong associations between childhood maltreatment severity and psychopathological symptoms in adulthood were observed. Large correlations between emotional abuse and neglect as well as small correlations between sexual abuse and the other types of childhood maltreatment hint to qualitative different aspects of different types of childhood maltreatment and might imply different impacts on mental health in later life. This hypothesis, however, should be evaluated in future studies.

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Conflict of interest statement

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Tables

Table 1. Sociodemographic characteristics of the participants from the NAKO DF100K.

Sociodemographic Characteristics	Whole Sample (N=76,731)	Men (N=36,327)	Women (N=40,404)
Age, M (SD)	51.39 (12.08)	52.08 (12.12)	50.77 (12.01)
Sex (Male)	47.3%		
Education			
Lower	1.9%	1.4%	2.4%
Intermediate	40.9%	36.1%	45.3%
Higher	57.2%	62.5%	52.3%
Marital Status			
Married	60.5%	64.3%	57.1%
Separated	1.8%	1.7%	2.0%
Single	23.7%	23.7%	23.7%
Divorced	11.0%	8.9%	12.9%
Widowed	3.0%	1.4%	4.4%
Partnership (Yes)	82.1%	85.7%	78.9%
German as a Native language (Yes)	94.5%	94.7%	94.3%
Multilingual including German (Yes)	2.3%	2.3%	2.3%
PHQ9 Summary Score, M (SD)	3.81 (3.67)	3.31 (3.44)	4.27 (3.81)
GAD7 Summary Score, M (SD)	3.12 (3.19)	2.64 (2.92)	3.55 (3.36)
PHQ-Stress Sum Score, M (SD)	3.55 (3.09)	3.04 (2.82)	4.02 (3.24)
CTS Summary Score, M (SD)	7.38 (2.74)	7.31 (2.48)	7.44 (2.95)
Any Maltreatment (Yes)	27.5%	24.8%	30.0%
Any Abuse (Yes)	17.0%	13.4%	20.2%
Any Neglect (Yes)	16.5%	15.9%	17.1%
German Language Skills (if German was NOT the native language)	**Whole Sample (N=4,251)**	**Men (N=1,935)**	**Women (N=2,316)**
Very High	35.4%	32.6%	37.7%
High	41.9%	42.5%	41.4%
Average	20.3%	22.3%	18.6%
Low	2.1%	2.1%	2.1%
Very Low	0.2%	0.3%	0.2%

M = Mean, SD = Standard Deviation

Table 2. Percentages of Participants Reporting None or Any Childhood Maltreatment, Childhood Abuse or Childhood Neglect Itemised by Socioeconomic Variables (N=76,731).

	Any Maltreatment		Any Abuse		Any Neglect	
	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)
Age (MAD)	5.7		2.2		5.3	
20-29	85.3	14.7	88.5	11.5	94.5	5.5
30-39	80.2	19.8	85.4	14.6	91.4	8.6
40-49	75.1	24.9	83.6	16.4	86.4	13.6
50-59	69.6	30.4	80.8	19.2	81.6	18.4
60-72	67.7	32.3	82.9	17.1	77.8	22.2
Sex (MAD)	2.6		3.4		0.6	
Men	75.2	24.8	86.6	13.4	84.1	15.9
Women	70.0	30.0	79.8	20.2	82.9	17.1
Education (MAD)	9.4		6.1		8.0	
Lower	51.2	48.8	69.2	30.8	65.3	34.7
Intermediate	68.7	31.3	80.6	19.4	80.8	19.2
Higher	75.9	24.1	85.3	14.7	86.0	14.0
Study Centre (MAD)	1.9		1.7		1.0	
Augsburg	73.1	26.9	83.5	16.5	83.6	16.4
Regensburg	73.3	26.7	84.2	15.8	83.6	16.4
Mannheim	70.6	29.4	81.7	18.3	82.8	17.2
Freiburg	70.4	29.6	80.9	19.1	83.5	16.5
Saarbrücken	73.0	27.0	82.4	17.6	84.7	15.3
Essen	68.2	31.8	79.8	20.2	80.9	19.1
Münster	74.0	26.0	83.5	16.5	85.0	15.0
Düsseldorf	70.7	29.3	82.8	17.2	81.2	18.8
Halle-Wittenberg	76.0	24.0	86.1	13.9	85.6	14.4
Leipzig	74.8	25.2	85.0	15.0	84.8	15.2
Berlin-North	73.1	26.9	84.0	16.0	83.3	16.7
Berlin-Centre	70.7	29.3	80.5	19.5	83.3	16.7
Berlin-South	70.2	29.8	79.9	20.1	83.3	16.7
Hannover	72.2	27.8	82.5	17.5	83.3	16.7
Hamburg	69.2	30.8	80.6	19.4	81.6	18.4
Bremen	71.0	29.0	81.2	18.8	82.7	17.3
Kiel	70.6	29.4	82.0	18.0	81.5	18.5
Neubrandenburg	76.2	23.8	88.0	12.0	84.1	15.9
Marital Status (MAD)	5.1		3.3		4.0	
Married	73.6	26.4	84.6	15.4	83.9	16.1
Separated	64.9	35.1	76.8	23.2	79.1	20.9
Single	75.7	24.3	83.5	16.5	86.9	13.1
Divorced	62.4	37.6	75.4	24.6	76.4	23.6
Widowed	64.5	35.5	79.3	20.7	75.6	24.4
Partnership (MAD)	3.6		3.2		2.3	
Yes	73.8	26.2	84.2	15.8	84.3	15.7
No	66.6	33.4	77.7	22.3	79.7	20.3
German as a Native language (MAD)	4.6		1.6		3.4	
Yes	73.0	27.0	83.2	16.8	83.8	16.2
No	63.8	36.2	79.9	20.1	77.1	22.9
German Language Skills (MAD; N=4,251)	10.1		2.9		10.5	
Very High	69.4	30.6	78.8	21.2	83.3	16.7
High	63.8	36.2	80.5	19.5	77.3	22.7
Average	56.0	44.0	80.9	19.1	67.6	32.4
Low	50.6	49.4	78.7	21.3	64.0	36.0
Very Low	33.3	66.7	88.9	11.1	44.4	55.6

MAD = Mean Absolute Deviation (around the mean)

All associations reached significance (range: <2.225e-308 – 3.584e-04), except of the association between German language skills and any abuse (p=.819).

Table 3. Distribution of the Responses to the CTS-Items of the participants from the NAKO DF100K (N=76,731). Categories attributed as "maltreated" according to Glaesmer et al. (2013) are highlighted in grey.

	Mean	SD	Never	Rarely	Sometimes	Often	Very Often	Maltreated
Physical Neglect: ...I knew there was someone to take care of me and protect me. (R)	4.15	1.18	5.7%	5.2%	13.6%	19.2%	56.4%	10.9%
Emotional Neglect: ...someone in my family helped me feel important or special. (R)	4.20	0.98	1.9%	6.3%	9.3%	34.8%	47.7%	8.2%
Physical Abuse: ...got hit so hard that I had to see a doctor or go to the hospital.	1.33	0.76	79.9%	11.5%	5.8%	1.8%	1.1%	8.6%
Emotional Abuse: ...people in my family called me stupid, lazy or ugly.	1.30	0.78	83.9%	8.0%	4.5%	2.3%	1.5%	8.2%
Sexual Abuse: ...someone tried to touch me in a sexual way/made me touch them.	1.11	0.47	93.6%	3.2%	2.3%	0.5%	0.5%	6.4%

Table 4. Correlation Matrix of the CTS-Items and the CTS-Sum Score of the participants from the NAKO DF100K (N=76,731).

	Physical Neglect	**Emotional Neglect**	**Physical Abuse**	**Emotional Abuse**	**Sexual Abuse**
Summary Score	0.64 (0.63; 0.64)	0.67 (0.67; 0.67)	0.46 (0.45; 0.46)	0.45 (0.45; 0.46)	0.25 (0.24; 0.25)
Physical Neglect		0.33 (0.33; 0.34)	0.16 (0.15; 0.16)	0.14 (0.14; 0.15)	0.07 (0.06; 0.07)
Emotional Neglect			0.32 (0.31; 0.32)	0.35 (0.34; 0.35)	0.14 (0.13; 0.15)
Physical Abuse				0.39 (0.38; 0.39)	0.17 (0.16; 0.18)
Emotional Abuse					0.20 (0.19; 0.21)

Kendall's τ (95%-Confidence Interval)
All correlations reached significance (range: <2.225e-308 – 1.551e-75).

Table 5. Associations of Experiencing Any Childhood Maltreatment, Childhood Abuse or Childhood Neglect with Affective Symptoms in Adulthood**.**

	PHQ9 Summary Score (N=76,120)		GAD7 Summary Score (N=76,079)		PHQ-Stress Summary Score (N=76,426)	
	M (SD)	**β**	**M (SD)**	**β**	**M (SD)**	**β**
Any Maltreatment		0.16 (0.15; 0.16)		0.14 (0.13; 0.15)		0.16 (0.15; 0.16)
No	3.46 (3.26)		2.85 (2.88)		3.24 (2.81)	
Yes	4.76 (4.43)		3.84 (3.79)		4.37 (3.60)	
Any Abuse		0.18 (0.18; 0.19)		0.17 (0.16; 0.17)		0.19 (0.18; 0.20)
No	3.49 (3.34)		2.86 (2.93)		3.27 (2.85)	
Yes	5.42 (4.66)		4.38 (3.99)		4.96 (3.74)	
Any Neglect		0.10 (0.10; 0.11)		0.09 (0.08; 0.09)		0.09 (0.09; 0.10)
No	3.65 (3.45)		3.01 (3.03)		3.43 (2.95)	
Yes	4.62 (4.52)		3.69 (3.84)		4.19 (3.64)	

β = standardised regression coefficient adjusted for age, sex, education and study centre
All β-values reached significance (range: <2.225e-308 – 1.249e-128).

Table 6. Associations of the CTS-Items and the CTS Summary Score with Symptoms of Depression, Anxiety Level and Perceived Stress

	PHQ9 Summary Score (N=76,120)		GAD7 Summary Score (N=76,079)		PHQ-Stress Summary Score (N=76,426)	
	r (95%-CI)	β	r (95%-CI)	β	r (95%-CI)	β
CTS Summary Score	0.22 (0.22; 0.23)	0.23 (0.22; 0.24)	0.20 (0.19; 0.20)	0.21 (0.20; 0.21)	0.22 (0.21; 0.23)	0.22 (0.22; 0.23)
Physical Neglect	0.04 (0.04; 0.05)	0.06 (0.05; 0.06)	0.03 (0.03; 0.04)	0.05 (0.04; 0.06)	0.05 (0.04; 0.06)	0.06 (0.05; 0.07)
Emotional Neglect	0.22 (0.21; 0.23)	0.22 (0.22; 0.23)	0.19 (0.18; 0.19)	0.20 (0.19; 0.20)	0.20 (0.19; 0.21)	0.21 (0.20; 0.21)
Physical Abuse	0.15 (0.14; 0.15)	0.15 (0.15; 0.16)	0.13 (0.12; 0.13)	0.14 (0.13; 0.14)	0.15 (0.14; 0.15)	0.15 (0.15; 0.16)
Emotional Abuse	0.22 (0.21; 0.23)	0.20 (0.20; 0.21)	0.20 (0.20; 0.21)	0.19 (0.18; 0.19)	0.21 (0.21; 0.22)	0.20 (0.19; 0.20)
Sexual Abuse	0.14 (0.14; 0.15)	0.12 (0.12; 0.13)	0.13 (0.12; 0.13)	0.11 (0.10; 0.12)	0.15 (0.14; 0.16)	0.13 (0.12; 0.14)

β = standardised regression coefficient adjusted for age, sex, education and study centre
All β-values reached significance (range: <2.225e-308 – 3.286e-43).

Figures

Figure 1. Frequencies of the Number of Different Childhood Maltreatment Types Reported. The five CTS-items were categorized according to Glaesmer et al. (2013); see also Table 2. Afterwards the number of items categorized as "maltreatment" was counted.

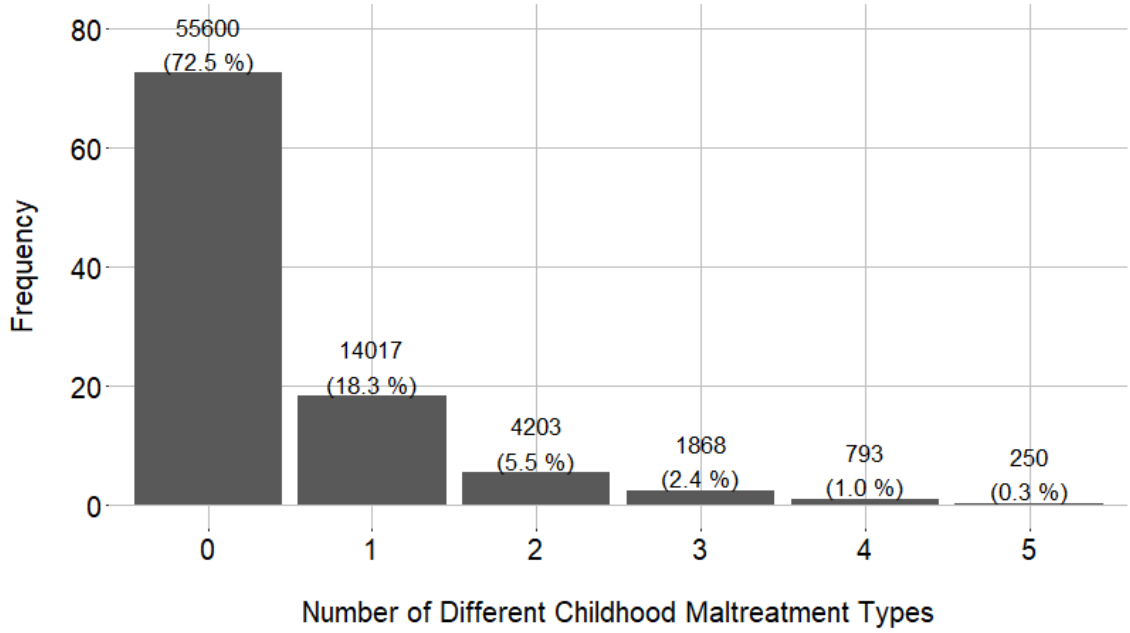

Figure 2. Frequencies of Reporting Any Childhood Maltreatment, Childhood Abuse or Childhood Neglect over the 18 NAKO study centres. The five CTS-items were categorized according to Glaesmer et al. (2013); see also Table 2. If any of the items was categorized as "maltreatment", any maltreatment was affirmed. Likewise, abuse and neglect were defined using the items assessing abuse and neglect, respectively.

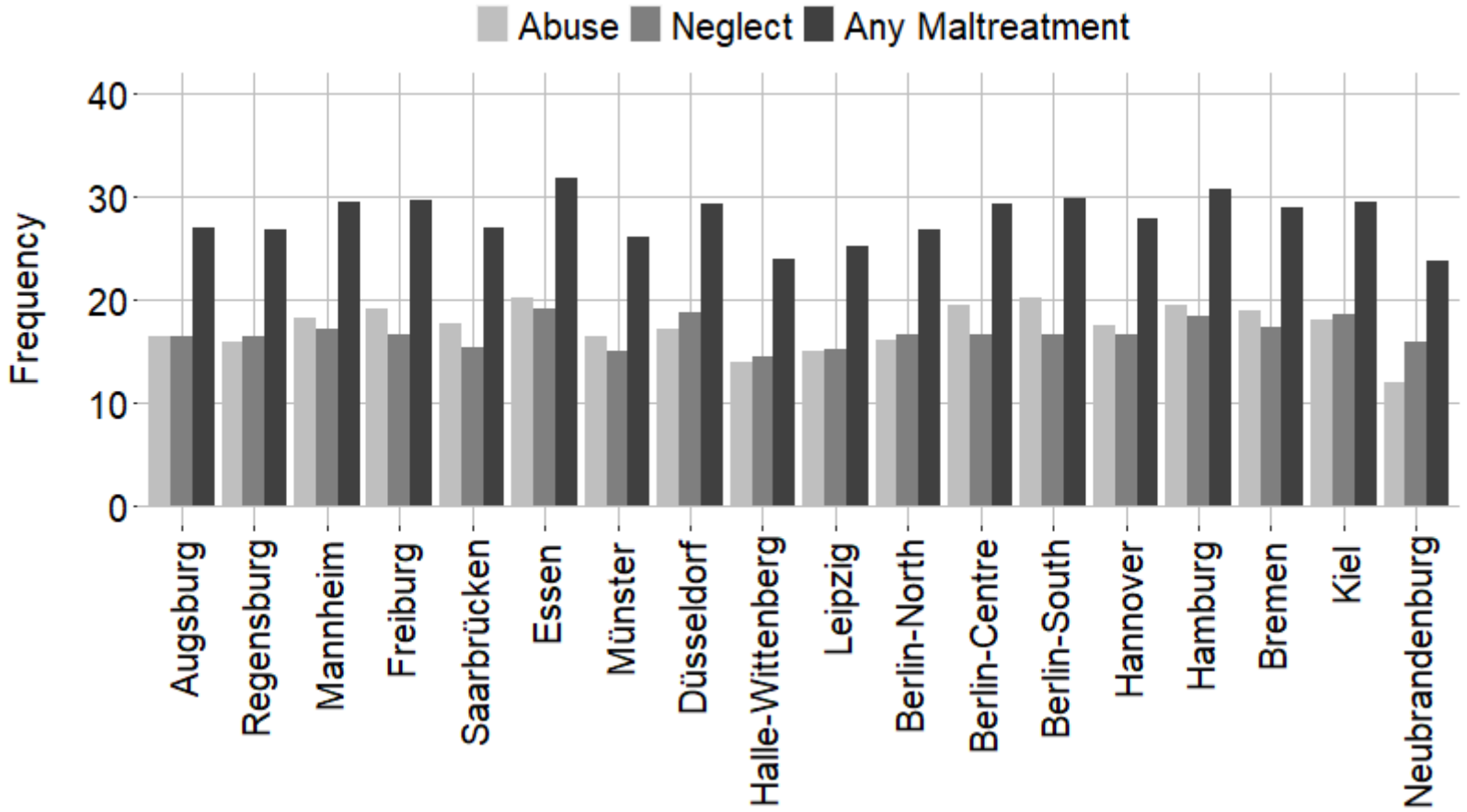

Figure 3. Means and Standard Error for the Summary Scores of the PHQ9, the GAD7 and the PHQ-Stress in Participants (Not) Reporting Any Childhood Maltreatment, Childhood Abuse or Childhood Neglect.