

Learning How to Ask - Does a one-day training increase trauma inquiry in routine substance use disorder practice? Results of a cluster-randomized controlled trial

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### **Abstract**

*Aims:* To examine the effectiveness of a one-day skills training program for increasing trauma inquiry in routine substance use disorder treatment. *Design:* Cluster-randomized two-armed controlled trial, with 12 substance use disorder (SUD) organizations operating 25 counseling centers, randomly assigned to training in trauma inquiry (13 counseling centers of 8 SUD organizations) or no training (12 counseling centers of 4 SUD organizations). *Setting:* SUD counseling centers in Northern Germany. *Cases:* N = 5,204 SUD counseling services.

*Intervention:* The professionals assigned to the intervention group received a one-day training in trauma inquiry plus a 1.5-hour refresher session 3 months later. Professionals in the control group received no training. *Measures:* Over a 12-month period, professionals documented for each counseling service whether they asked the client about four traumatic events: physical abuse, emotional abuse, sexual abuse and neglect. *Analysis:* Primary outcomes were rates of asking about physical abuse, sexual abuse, emotional abuse and neglect in the 6 months after training. These were compared across conditions, while adjusting for baseline probabilities in the 6 months before the intervention, using mixed-effects logistic regression. *Findings:* In the 6 months after training, the rate of asking about physical abuse was 18% higher in the SUD counseling services of trained professionals, relative to services of untrained professionals (OR = 1.18, 95% CI = [1.01–1.37, p = .035]).

No effect was found for asking about sexual abuse, emotional abuse and neglect.

**Conclusion:** A one-day training program in trauma inquiry, combined with a brief refresher session, was effective in increasing inquiries about physical abuse in routine counseling practice. The training was ineffective in increasing inquiries about sexual abuse, emotional abuse and neglect. The effectiveness of a one-day training of trauma inquiry might be increased by a longer training, or by combining it with additional elements, such as ongoing supervision.

*Keywords:* abuse, neglect, violence, trauma-informed care, trauma inquiry, addiction, counseling, substance abuse, substance dependence

## **1 Introduction**

Traumatic events in childhood, such as physical, sexual and emotional abuse, but also neglect, are universal public health problems that affect the lives of millions of people internationally (Stoltenborgh, Bakermans-Kranenburg, Alink, & van IJzendoorn, 2015). Exposure to childhood trauma is strongly associated with substance use disorders later in life (SUD; Kendler et al., 2000). For example, childhood sexual abuse predicts a five-fold increase in risk of developing alcohol abuse and a seven-fold increase in risk of illicit substance abuse in adulthood (Kendler et al., 2000). The higher the number of traumatic events, the higher the risk for SUD (Scheidell et al., 2017). Accordingly, traumatic events in childhood are highly prevalent among clients in SUD treatment (Huang, Schwandt, Ramchandani, George, & Heilig, 2012; Rosenkranz, Muller, & Henderson, 2014). One in two clients with alcohol dependence report at least one type of abuse or neglect in childhood, while one in three report physical abuse and one in four report sexual abuse (Huang et al., 2012). SUD clients exposed to traumatic events in childhood frequently present with increased SUD severity (Lown, Nayak, Korcha, & Greenfield, 2011) and higher numbers of comorbid mental disorders (Evren, Kural, & Cakmak, 2006; Kessler et al., 1997) when compared to SUD clients without trauma exposure. Given the higher severity of SUD in clients with childhood trauma, their treatment outcomes are also worse (Walitzer & Dearing, 2006).

Traumatic events in adulthood, such as physical or sexual abuse, are also highly prevalent in SUD clients (Farley, Golding, Young, Mulligan, & Minkoff, 2004) and predict greater SUD severity and poorer treatment outcomes. For example, it has been shown that adulthood trauma is related to earlier relapse (Farley et al., 2004) and more frequent drop out from treatment (Thompson & Kingree, 1998).

Given the high prevalence of traumatic events in both childhood and adulthood for clients accessing SUD services, and the greater severity and complexity of health problems of clients that report such events, the detection of traumatic events seems important in SUD treatment settings. Identification of traumatic events may help to improve responses to the trauma-specific needs in clients with SUD (SAMSHA, 2014; p. 167), which may include the direct provision of interventions or referral to specialized services (Bateman, Henderson, & Kezelman, 2013). At present, however, traumatic events and trauma-specific needs are commonly undetected in clients of health care services (Read, Harper, Tucker, & Kennedy, 2018; Read, McGregor, Coggan, & Thomas, 2006), and most clients with a history of trauma do not receive trauma-informed care or evidence-based trauma-specific treatments (Rosner, Henkel, Ginkel, & Mestel, 2015). Studies suggest that health professionals frequently hesitate to ask their clients about such events because of fear of offending the client or exacerbating their psychological state (Sugg & Inui, 1992; Young, Read, Barker-Collo, & Harrison, 2001). In addition, many professionals lack key competences for inquiring about traumatic events (Lothian & Read, 2002; Salyers, Evans, Bond, & Meyer, 2004; Warne & McAndrew, 2005), whereby improvements in professionals' knowledge and skills in detecting traumatic events is extremely important.

Only a handful of training programs have been developed to improve the skills of health professionals in trauma-informed care, including inquiries about traumatic events (Courtois & Gold, 2009). The 'Learning How to Ask' training (Read and colleagues (2007) is one of such programs that equips health care professionals with basic information and skills for asking about, and responding to, reports of adverse and traumatic events, which are practiced subsequently in role plays. This training has been adapted for staff working in SUD health care in Germany ('Learning How to Ask' training; Lotzin et al., 2018).

Most of the available training programs have not been empirically evaluated, or have only been examined in small samples (Brown, Baker, & Wilcox, 2012; Cavanagh, New, & Read, 2004a; Donohoe, 2010). These studies provide preliminary evidence that brief training in trauma inquiry can enhance professionals' knowledge and skills in inquiring about traumatic events (Cavanagh, New, & Read, 2004b; Courtois & Gold, 2009; Currier & Briere, 2000; Read et al., 2007). By way of illustration, there is one randomized controlled trial that has evaluated the impacts of the Learning How to Ask' training on levels of inquiry about traumatic events (Lotzin et al., 2018). In order to assess inquiry, the professionals were asked before and after the intervention to retrospectively recall their overall level of their inquiry behaviors (e.g., 'How often did you ask your clients about physical abuse within the last 3 months?': 'never', 'sometimes', 'almost always', 'always'). The results of this cluster-randomized controlled trial supported the assertion that brief training can help to increase inquiries about abuse and neglect in the short-term (Lotzin et al., 2018).

The use of retrospective ratings to assess a behavior of interest is one of the most frequently used approaches to outcome measurement in studies of psychosocial interventions. However, this approach requires that the respondent can accurately recall behavior within the relevant time period, and is prone to biases related to anchoring effects, primacy and recency effects, and consistency of motivation (Kamper, Maher, & Mackay, 2009). In the current cluster-randomized controlled trial, we therefore aimed to evaluate the effectiveness of the 'Learning How to Ask' training for increasing inquiries about traumatic events through use of a more reliable measurement method. In particular, we had the unique opportunity in this study to integrate questions about health professionals' trauma inquiry behaviors in the routine client documentation of 25 substance use disorder centers in the German federal states of Schleswig-

Holstein and Hamburg. In these states, a software-based client documentation system, called BADO (Basic documentation in outpatient addiction care, [www.bado.de](http://www.bado.de)), is used to document each SUD treatment that is conducted in all facilities that offer outpatient treatment for individuals with SUD. These SUD facilities provide counselling services for clients with abuse of legal substances, illegal substances, or both. By implementing questions into the BADO system of 25 SUD centers in Northern Germany, we were able to continuously document the professionals' inquiry behavior during routine SUD counseling practice over one year. All SUD professionals included in this study were instructed to document for each SUD counseling service whether they had asked the client about four types of traumatic events, including physical abuse, sexual abuse, emotional abuse and neglect. Analyses of professionals' inquiry behaviors on the basis of ratings of all SUD counseling services that were conducted across one year of routine SUD treatment have not been conducted before, and were expected to yield more reliable results relative to global and retrospective ratings.

## **2 Methods**

### *2.1 Design*

The study is a cluster-randomized trial design with two groups, and with randomization conducted at the level of the SUD counseling organization. The study was approved by the local ethics committee of the Medical Chamber of Hamburg.

### *2.2 Sample*

SUD treatment centers were selected from a population of 58 outpatient SUD treatment facilities in Hamburg (Martens & Neumann-Runde, 2014) and 70 outpatient SUD treatment facilities in Schleswig-Holstein (Buth, Schütze, & Kalke, 2014) that provided services for clients with problems related to substance abuse, i.e., SUD counseling, rehabilitation, low-threshold

interventions and/or maintenance treatment. SUD treatment centers were eligible for study inclusion if they (1) offered outpatient SUD counseling to assist clients in overcoming problems related to substance abuse and (2) if the head of the center provided written informed-consent. Counseling services (i.e., one session or a series of sessions for an individual client) were included in the study if (1) the counseling service lasted less than 6 months to avoid contamination with the training.

### 2.3 *Intervention*

The one-day ‘Learning How to Ask’ training on trauma inquiry (Lotzin et al., 2018) includes eight 50-minute units covering the following topics:

- (1) Types and prevalence of traumatic events;
- (2) Effects of traumatic events on mental health;
- (3) Symptoms characterizing posttraumatic stress disorders;
- (4) Barriers to asking about traumatic events;
- (5) Basic rules of how to ask about traumatic events;
- (6) Basic rules of how to respond to reports of traumatic events;
- (7) Documentation of traumatic events; and
- (8) Trauma-related resources in the community

Professionals were encouraged to reflect upon their current practice of trauma inquiry. Psychological barriers to inquiry were discussed and basic principles of asking and responding to disclosures of traumatic events were introduced and practiced through role-play. A more detailed description of the training can be found elsewhere (Lotzin et al., 2018). A brief 1.5-hour refresher training was offered 3 months later, which included discussion of experiences with trauma inquiry in routine practice, and rehearsal of basic principles of inquiry and response.

## 2.4 Outcomes

The primary outcomes were asking about four types of traumatic events (physical abuse, sexual abuse, emotional abuse, neglect) in the SUD counseling services across the 6 months after the training. As a SUD counseling service was defined as one session or a series of counseling sessions of one client, an inquiry in any of those sessions was counted as an inquiry.

We hypothesized that the rate of inquiries about the four types of traumatic events (considered as separate outcomes in one analysis) would be greater in the training group than in the control group. As a secondary outcome, we assessed the rate of asking about traumatic events in the SUD counseling services that were conducted during the time of training, i.e., started before the training but were not finished at the time of training.

Inquiries about traumatic events were measured using an electronic questionnaire, implemented in the routine documentation system of all participating centers (BADO, Basic documentation in the field of addiction, [www.bado.de](http://www.bado.de)). The BADO incorporates the “German Core Item Set for documentation in the field of addiction treatment” (DHS, 2018), which is used in all German SUD facilities to document SUD treatment of all clients. All professionals working in SUD health care centers in Hamburg and Schleswig-Holstein are continuously trained in the administration of the BADO.

For this study, four items were integrated with the BADO interface to measure inquiry about four types of traumatic events: physical abuse, sexual abuse, emotional abuse and neglect. Four questions were asked: “Did the client experience [type of traumatic event]?” The response options comprised six categories: (1) “No”; (2) “Yes, in childhood (0-15 years)”; (3) “Yes, in adulthood (from 16 years)”, (4) “Yes, in both childhood and adulthood”; (5) “Client does not want to provide specific information“; and (6) “Not asked“. For current analyses the response



options 1-5 were collapsed to form a binary measure (0 = “Not asked”; 1 = “Asked”). The professionals of both the intervention and control group were instructed by the study staff to answer all four questions at the beginning of each client’s SUD service. In the documentation software, the questions were visible and could be answered at any time during the SUD service. The questions about trauma inquiry were not prompted by the software to be answered. The study team reminded the professionals to document their trauma inquiry behavior during the data assessment period of the study. Professionals of the control group only received the instruction to assess their inquiry behavior, but no additional information or training.

### *2.5 Sample Size*

A priori, it was estimated that the baseline rate of asking about traumatic events would be 40%, as previously found in German SUD facilities (Schäfer et al., 2009). We assumed that the training would yield a 20% increase of asking about traumatic events, as found in an earlier brief training in trauma inquiry (Currier & Briere, 2000). Assuming an  $\alpha$ -level of  $p = .05$  and a power of 100% to enable the analysis of subgroups, it was calculated that  $n = 420$  clients must be included in the 6 months after the training.

### *2.6 Randomization*

Randomization to the intervention or control group was conducted on the level of the SUD organization to prevent treatment contamination by professionals that worked in more than one SUD center. The allocation sequence for the random assignment of the organizations to the training or control group was generated by the randomization software DatInf RandList Version 1.2. Randomization was stratified by the number of professionals ( $< 20$  vs.  $\geq 20$ ) to balance group size. The randomization list was stored in a password-protected file. The random

allocation sequence was generated by the first author who enrolled organizations and who assigned organizations to the training or control group.

## 2.7 Procedure

SUD centers were recruited from July 2013 through December 2013. The heads and the professionals of all SUD centers located in the federal states of Hamburg or Schleswig-Holstein in Northern Germany were contacted and informed about the study (Figure 1). Eligible SUD organizations were randomized to an intervention or a waiting list control group. All professionals continuously documented for each SUD counseling service over one year (January to December 2014) whether they inquired about traumatic events. The professionals working in SUD organizations randomized to the intervention group received the ‘Learning How to Ask’ training after 6 months. The professionals of the SUD organizations randomized to the control group received no training during the data assessment period of 12 months, but received the training subsequently. The one-day training was conducted between May and July 2014 by an experienced psychiatrist and/or psychologist in groups ranging from 5 to 16 professionals. The training took place at the university at which the study was conducted, or at the SUD counseling center if on-site training was preferred. A brief 1.5-hour refresher training was offered 3 months later.

## 2.8 Statistical Methods

For the description of the sample characteristics, means, medians or frequencies and percentages were computed and compared between the intervention and control group within time intervals. Group differences were examined using  $\chi^2$ -test for categorical variables,  $t$ -test for continuous data and two-sample test for proportions.

There were no missing values in the independent variables. Missing values in the outcome variables (emotional abuse 8.0%, physical abuse 1.5%, sexual abuse 2.5%, neglect 8.2%) were not imputed, as this is not recommended if no good auxiliary variables are available (Allison, 2001). In this case, the best practice (Von Hippel, 2007) is to use all cases in the imputation model, including the cases with missing values in the outcome variables, but to exclude the cases with missing values in the outcome in data analysis.

The main analysis was conducted using one mixed-effects logistic regression model which included four outcomes (inquiry of physical abuse, sexual abuse, emotional abuse and neglect). First, baseline probabilities of asking about the four types of traumatic events in the 6 months before the intervention were calculated for each professional on the basis of the following baseline client characteristics: client's gender, age, main drug ('cannabis', 'opioids/crack', 'cocaine', 'gambling/internet games', 'other substance', 'substance unknown'); client's counseling duration (days); service provider's type of substance for which service was offered ('predominantly legal substances', 'predominantly illegal substances' or 'legal and illegal substances to the same extent'). The rates of asking about the four types of traumatic events in the 6 months after the training, adjusted for the baseline probabilities in the 6 months before the intervention, were compared between the intervention and control group.

In the same model, rates of asking about the four types of traumatic events during the time of the intervention, adjusted for the baseline probabilities in the 6 months before the intervention, were also compared between the intervention and control group.

To estimate the effect of training, indicators of group allocation (training vs. control), the time of counseling (during vs. after training) and the interaction term were included in the adjusted model as fixed effects. In case of a non-significant interaction term, only the main

effects remained in the model, as determined by the likelihood ratio test for purposes of model comparison.

To control for clustering of SUD counselling services within SUD organizations, a random intercept term for the level of the SUD organizations was included in the model. To control for clustering of counselling services within SUD centers, a random intercept term for the level of the SUD centers was included in the model. Clustering of counselling services in professionals was not considered.

Robust estimators of variance (sandwich estimators) were applied. Odds ratios and their 95%-confidence intervals were reported for the four trauma types. A two-tailed  $p < .05$  was considered as statistically significant. Nominal  $p$ -values were reported without correction for multiplicity. Statistical analyses were conducted using Stata 14.1 (STATA Corporation, College Station, Texas, USA).

### **3 Results**

#### *3.1 Participant Flow*

We contacted 32 SUD counseling centers of 12 SUD organizations (Figure 1). Twenty-five counseling centers of 10 SUD organizations were willing to participate in the study, leading to a higher sample size than planned for the study. In the planning phase of the study, we expected lower participation rates, because professionals had to continuously collect study data for each conducted counseling service for one year. The 25 SUD counseling centers included in this study were cluster-randomized on the level of the SUD organizations. Within the 12-month data assessment period, 6,774 SUD counseling services were conducted, of which 1,570 were excluded because of missing values in the outcome variables. Accordingly, 5,204 counseling services were included in the analysis.

### 3.2 *Sample Characteristics*

Most of the SUD services were conducted with male clients (Table 1). At the end of training, there were higher rates of male clients in the intervention group than in the control group. The main substance for which clients had sought SUD counseling also differed between the intervention and control group at baseline, as well as during training and post training. A significantly higher rate of clients with cannabis use disorders were in the control group than in the intervention group at baseline and after training. There was also a significantly higher rate of clients with problems related to gambling or internet games in the control group than in the intervention group at baseline, during training and after training. In the intervention group, the main substance was unknown for a higher rate of clients at baseline, during and after training.

Post training, clients in the intervention group received more counseling sessions and had a longer duration of counseling than clients in the control group. No differences were found in the remaining client characteristics in Table 1.

Unadjusted rates of asking about the four types of traumatic events are reported in Table 2. The rates of sexual abuse, emotional abuse and neglect were significantly higher in the SUD services of the intervention group than in the services in the control group at baseline. In the intervention group, the unadjusted rates of trauma inquiry were higher both during and after training relative to baseline. In the control group, the rates of trauma inquiry were also higher during the training compared to baseline, but not after training.

### 3.3 *Results of Main Analysis*

As hypothesized, we found a significant intervention effect for the rate of asking about physical abuse (OR = 1.18, 95% CI = 1.01–1.37,  $p = .035$ , Figure 2), after adjusting for the rate of asking about physical abuse at baseline. The point estimate for the OR indicated that within 6

months of the training, the rate of asking about physical abuse was 18% higher in SUD counseling services in the intervention group, compared to SUD counseling services in the control group. The rate of asking about physical abuse did not significantly differ in the services conducted within 6 months after training compared to the rate observed in services that were conducted during the time of training (OR = 0.82, 95% CI = 0.67–1.01,  $p = .066$ ), indicating that the rate of asking about physical abuse did not differ between these time periods.

In contrast to our hypothesis, no intervention effect was found for the rate of asking about sexual abuse, emotional abuse or neglect (emotional abuse: OR = 1.06, 95% CI = .91–1.24,  $p = .479$ ; sexual abuse: OR = 1.07, 95% CI = .92–1.24,  $p = .413$ , neglect: OR = 1.03, 95% CI = .88–1.21,  $p = .701$ ).

#### **4 Discussion**

This cluster-randomized trial examined the effectiveness of the ‘Learning How to Ask’ training for increasing trauma inquiry among SUD professionals in routine counseling practice. Whether professionals asked their clients about physical abuse, sexual abuse, emotional abuse or neglect was assessed in 5,204 SUD counseling services in Northern Germany. Within the 6 months after the training, we found that the rate of physical abuse inquiry was 18% higher in the SUD counseling services of the intervention group compared to the control group. This finding indicates that SUD professionals’ inquiry behavior about physical abuse in routine SUD practice can be enhanced by a single day of training in combination with a brief refresher session. Increasing physical abuse inquiry in SUD health care is important given that physical abuse is highly prevalent among SUD clients (Kendler et al., 2000; Simpson & Miller, 2002), and that recognition of abuse is necessary to enhance the delivery of trauma-informed care or trauma-specific treatment.

Our results are consistent with previous studies indicating that training may be effective for increasing inquiry of physical abuse in the short-term (Brown et al., 2012; Cavanagh et al., 2004a; Donohoe, 2010). In an earlier randomized trial conducted by our research group (Lotzin et al., 2018), we also found that the ‘Learning How to Ask’ training can increase SUD professionals’ physical abuse inquiry behavior. Compared to untrained professionals, the trained professionals reported more frequent inquiries about physical abuse at 3-month and 6-month follow-up after training. In this previous study, a global self-rating was used to assess inquiry behavior, which differs from the current trial which used a more sophisticated approach in which professionals continuously documented for each SUD counseling service over one year, whether they asked clients about traumatic events. In this study, more than 5,000 SUD services were rated; such an approach may yield more accurate results relative to a global retrospective recall of inquiry behavior. On the basis of this new data, it seems that a one-day training program in trauma inquiry is effective in increasing inquiries about physical abuse in routine counseling practice.

The current study also found that there were no discernible effects of the training on levels of inquiry about sexual abuse, emotional abuse and neglect. This result is inconsistent with the earlier study in which we found that the training also increased the inquiry about sexual abuse, emotional abuse and neglect (Lotzin et al., 2018). As noted, this previous study used a global self-rating to assess professionals’ inquiry behavior, and this may be prone to biases related to anchoring effects, primacy and recency effects, and consistency of motivation (Kamper et al., 2009). As the measurement method in this study might have reduced these biases (Choi & Pak, 2005), the current results may represent a more accurate portrayal of the actual inquiry behavior of professionals in routine SUD practice.

The results of this study indicate that the training had no discernible effects on inquiries about sexual abuse, although this was practiced in the one-day training through role-plays. The systematic inquiry about sexual abuse seems particularly important given that victims rarely report abuse spontaneously (Friedman, Samet, Roberts, Hudlin, & Hans, 1992; Read et al., 2006), and have expressed preferences for being asked by health professionals (Friedman et al., 1992). Unfortunately, these professionals can be more hesitant to ask about sexual abuse than other types of traumatic events (Friedman et al., 1992; Read et al., 2006), which was consistent with findings from this study (where baseline rates of the inquiry about traumatic events was lowest for sexual abuse at around 47%). Sexual abuse is highly stigmatized in Western cultures, i.e., referred to negative connotations such as badness, shame and guilt, that are communicated to the victim of sexual abuse during and after the abuse by the perpetrator, but also by religious or cultural sexual norms of the society (Browne, 1991). Health care professionals may experience stigma-related shame when asking their clients about sexual abuse, or may fear that the client may be ashamed when being asked about being a victim of sexual abuse. This may mean that professionals may view greater risks from sexual abuse inquiry related to the inquiry for other types of traumatic events, e.g., for the rapport and the counseling relationship. Furthermore, professionals might be reluctant to ask about sexual abuse because they might believe that sexual abuse is more difficult to address than physical abuse and may be out of scope for a SUD service provider. To increase the inquiry of sexual abuse, there may be a need for extended training to allow for a more in-depth practice of trauma inquiry, and enhancement with additional forms of training, for example interventions that focus on reductions in stigma. This study also found that the training had no significant effects on inquiries about emotional abuse and neglect. The primary focus in the trainings was on practicing inquiry of



sexual abuse and physical abuse in role plays, but not on practicing inquiry of emotional abuse and neglect. To increase inquiry of these types of trauma, extended practice may be helpful. A more detailed psychoeducation on the importance of emotional abuse and neglect for clients' mental health might also increase inquiry.

Besides the possibility that the training is ineffective to increase physical abuse, emotional abuse and neglect in routine practice, it should be considered that the training might be an effective component of a complex intervention. Research on primary care responses to domestic violence suggested that training in trauma inquiry was insufficient when provided in isolation, but produced discernible changes in behavior when it included additional organizational and system support (Feder et al., 2011).

A secondary finding of this study was that the (unadjusted) rates of trauma inquiry increased in the SUD counseling services during the study for both the intervention and control group. It seems likely that this was due to the general requirement in this study to document whether traumatic events had been assessed, which may have encouraged counselors of both groups to inquire traumatic events. However, the increase was smaller in the control group than in the intervention group, and not long lasting, as the rates of trauma inquiry were not higher in the 6 months after the training compared to baseline.

Strengths of this study include the usage of a large sample of SUD counseling services that were representative of routine practice, using a cluster-randomized controlled trial design. We continuously assessed our primary outcomes separately for each SUD counseling service over a period of one year, which also increased the reliability of our results. However, the results might be biased by our reliance on self-report measures to operationalize the effects of training. Self-reported behavior may deviate from actual observed behavior (Levin, Owen, Stinchfield,

Rabinowitz, & Pace, 1999) because of different sources of bias, including social-desirability (i.e., respondent wants to answer in accordance to the expectations of others; Van de Mortel, 2008) or achievement bias (i.e., respondent wants to achieve good performance; Choi & Pak, 2005). However, these sources of bias might have been minimized by a systematic training of the professionals in the BADO documentation system. The professionals also rated their inquiry behavior without personal contact with the study team, which might have reduced socially desirable responding. Nonetheless, further studies would benefit from complementing trials with behavioral observations by trained observers.

A strength of our data assessment approach was the integration of measures in the routine case documentation system of participating SUD centers. This assessment strategy reduced the additional documentation and effort required to conduct the study over the course of one year, and may have also increased the accuracy of the data. However, this assessment approach also had disadvantages. For example, it was more laborious and time-consuming than the usual approach to assessments involving retrospective recall, and also required substantial commitments from study participants over one year. Although it was requested to document trauma inquiry behavior for all SUD counseling services during the study period, some of the professionals did not document their' inquiry behavior for all services, leading to a substantial amount of missing data. The SUD counseling services with missing data might differ from the counseling services without missing data, and those differences might be related to differences in trauma inquiry behavior. In addition, the intervention and control group differed at baseline in the proportions of different types of SUD. It is possible that these differences were related to the inquiry about traumatic events.

The randomization of the SUD professionals on the level of the SUD organizations is another limitation of our study. A randomization on the level of the SUD centers was not conducted, as SUD professionals often worked across multiple SUD centers within a SUD organization. The latter might differ in their working procedures and settings, their attitudes towards routine trauma inquiry, and the proportion of clients exposed to traumatic events. These differences might be related to baseline differences in trauma inquiry and different training outcomes.

The finding that the results of this study diverged from previous research (Lotzin et al., 2018) on the same training but using a different measurement method (i.e., global retrospective recall) may have important implications for future evaluation studies. According to our results, global self-ratings may overestimate the effects of a training and should therefore be complemented by other measurement methods. Future research should also include outcomes measured at the client level, such as number of detected cases, number of referrals to trauma-related treatment, or the provision of trauma-related interventions. It might be also important to consider whether training in trauma inquiry affects SUD treatment response. Future research may also examine which elements of the training are particularly effective (Flay et al., 2005). From the participants' perspective, learning basic skills for asking about traumatic events and rehearsing these through role plays were seen as the most helpful parts of the training (Lotzin et al., 2018). These training components that went beyond didactics and education might be emphasized even more in further trainings.

As a training for trauma inquiry is also recommended for health care professionals of other disciplines than SUD, further studies are needed to evaluate the training in other healthcare

settings (Fixsen, Blase, Naoom, & Wallace, 2009; Glisson et al., 2008; Weaver, Salas, & King, 2011).

As our results indicate that a one-day training in trauma inquiry might be insufficient to increase the inquiry of sexual abuse, emotional abuse and neglect among health care professionals in routine practice, additional refresher sessions and on-the-job training might be necessary to sustain the inquiry of these types of traumatic events in routine practice. A change in the format of training delivery (e.g., repeated shorter training sessions instead of a single eight-hour training session) might be another approach that may increase feasibility and effectiveness. To achieve long-term implementation of trauma inquiry, ongoing supervision seems necessary. There is convincing evidence that case supervision can enhance the translation of newly learned behavior into practice (Edmunds, Beidas, & Kendall, 2013; Rakovshik, McManus, Vazquez-Montes, Muse, & Ougrin, 2016). However, one structural barrier to implementing training and ongoing supervision in SUD health care is scarce time and financial resources of SUD organizations. With regard to financial resources, web-based or blended training may reduce costs and improve dissemination. Another obstacle to systematic inquiry about traumatic events is a lack of training in trauma-informed care among the management staff in health care organizations. Further steps to improve systematic trauma inquiry could involve integrating trainings with the vocational curricula of health care professionals (Courtois & Gold, 2009).

Taken together, systematic assessment of traumatic events in SUD services seems necessary to provide adequate responses and thereby improve health and wellbeing for SUD clients affected by trauma. At present, health care professionals are often insufficiently trained in how to inquire about traumatic events (Salyers et al., 2004; Warne & McAndrew, 2005). The

results of this cluster-randomized trial indicate that SUD professionals more often inquire about physical abuse in their routine work practice after brief training combined with a refresher session, which may improve the provision of trauma-related support for clients. However, the training had no discernible effects on inquiries about sexual abuse, emotional abuse and neglect, which suggests the need to enhance training content, or add additional components such as ongoing supervision.

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## Figures

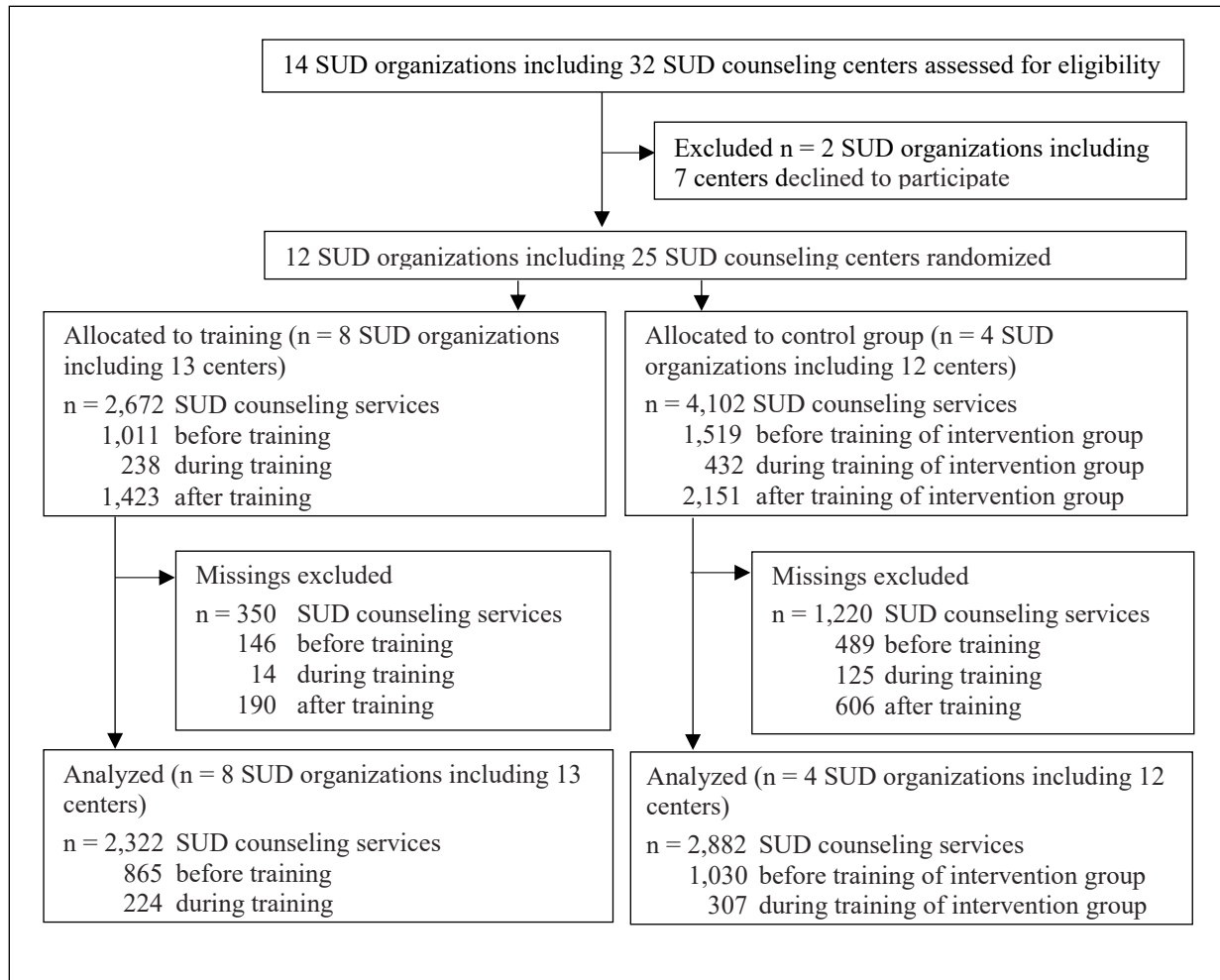
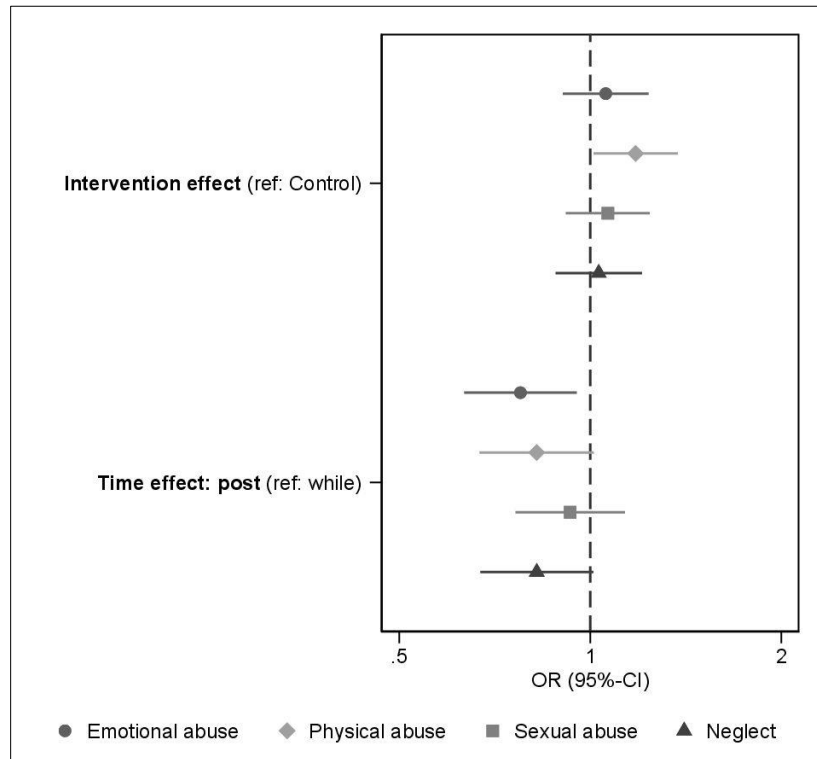


Figure 1. Flow of SUD Centers and SUD Counseling Services through the Trial.



*Figure 2.* Effect of the Intervention and Time on the Rate of Asking about Four Types of Traumatic Events.

Table 1. Characteristics of SUD Counseling Services and SUD Clients (N = 5,204)

Characteristics	Baseline		<i>p</i>	During training		<i>p</i>	Post training		<i>p</i>
	Intervention (n = 865)	Control (n = 1,030)		Intervention (n = 224)	Control (n = 307)		Intervention (n = 1,233)	Control (n = 1,545)	
Counseling services	<i>M (SD)</i>	<i>M (SD)</i>		<i>M (SD)</i>	<i>M (SD)</i>		<i>M (SD)</i>	<i>M (SD)</i>	
Duration (days)	40.1 (49.3)	41.0 (48.8)	.692	103.0 (45.7)	106.4 (47.7)	.415	46.7 (48.8)	54.9 (49.4)	<.001
Number of sessions, <i>n (%)</i>									
1	334 (38.6)	407 (39.5)	.195	20 (43716)	20 (6.5)	.173	465 (37.7)	513 (33.2)	.003
2-5	320 (37.0)	404 (39.2)		93 (41.5)	121 (39.4)		533 (43.2)	656 (42.5)	
6-10	144 (16.7)	138 (13.4)		66 (43614)	82 (26.7)		145 (11.8)	203 (13.1)	
11-30	63 (7.3)	79 (7.7)		45 (43728)	80 (26.1)		82 (6.7)	156 (10.1)	
31-50	4 (0.5)	2 (0.2)		0 (0)	4 (1.3)		8 (0.7)	17 (1.1)	
Clients, <i>M (SD)</i>									
Age	38.0 (12.8)	37.9 (12.8)	.896	38.0 (43690)	37.2 (13.0)	.494	38.4 (12.8)	39.0 (13.1)	.236
Gender, <i>n (%)</i>									
Female	191 (22.1)	250 (24.3)	.261	45 (43485)	67 (21.8)	.628	249 (20.2)	366 (23.7)	.028
Male	674 (77.9)	780 (75.7)		179 (79.9)	240 (78.9)		984 (79.8)	1,179 (76.3)	
Main drug, <i>n (%)</i>									
Alcohol	366 (42.3)	404 (39.2)	.173	89 (39.7)	111 (36.2)	.401	521 (42.3)	629 (40.7)	.412
Cannabis	152 (17.6)	218 (21.2)	.049	41 (18.3)	67 (21.8)	.320	205 (16.6)	322 (20.8)	.005
Opioids/Crack	101 (11.7)	123 (11.9)	.859	23 (10.3)	42 (13.7)	.236	133 (10.8)	185 (12.0)	.329
Cocaine	115 (13.3)	128 (12.4)	.574	31 (13.8)	35 (11.4)	.400	157 (12.7)	158 (10.2)	.038
Other substance than above	42 (4.9)	46 (4.5)	.688	6 (2.9)	24 (7.8)	.011	61 (4.9)	82 (5.3)	.670
Substance unknown	55 (6.4)	16 (1.6)	<.001	20 (8.9)	3 (1.0)	<.001	100 (8.1)	18 (1.2)	<.001
Gambling/Internet games	34 (3.9)	95 (9.2)	<.001	14 (6.3)	25 (8.1)	<.001	56 (4.5)	151 (9.8)	<.001



*Note.* Baseline = Services conducted in the 6 months before training. During training = Services conducted during time of training. Post training = Services conducted in the 6 months after training. Group differences were tested by using t-test for metric variables,  $\chi^2$ -test for categorical variables and two-sample test for proportions. Bold numbers indicate significant  $p$ -values.

Table 2. Unadjusted Rates of Asking about Traumatic Events by Group and Trauma Type (N = 5,204)

Type of trauma	Baseline		<i>p</i>	During training				<i>p</i>	Post training				<i>p</i>
	Intervention (n = 865)	Control (n = 1,030)		Intervention (n = 224)	Control (n = 307)	Intervention (n = 1,233)	Control (n = 1,545)		Intervention (n = 1,233)	Control (n = 1,545)			
	n (%)	n (%)		n	%	n	%		n	%	n	%	
Emotional abuse	340 (43.3)	363 (38.6)	.048	122	59.8	158	53.6	.167	511	46.2	578	39.7	<.001
Physical abuse	484 (57.0)	540 (52.8)	.068	158	71.2	195	63.9	.081	742	62.0	769	50.3	<.001
Sexual abuse	427 (50.8)	437 (43.4)	.001	115	56.4	151	49.4	.038	623	52.8	649	42.6	<.001
Neglect	326 (41.6)	344 (36.6)	.034	522	61.1	156	52.9	.442	488	44.2	557	38.4	.003

*Note.* Baseline = Services conducted in the 6 months before the training. During training = Services conducted during time of the training. Post training = Services conducted in the 6 months after the training. Between-group differences were tested by using  $\chi^2$ -test.

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