

# Group-Based Disclosure Intervention for Psychological Adjustment among Chinese Patients with an Accidental Injury: A Pilot Study

Chaoqun Dong<sup>a</sup>, Yin Zhu Pan<sup>b</sup>, Shumei Gong<sup>c</sup>

## Abstract

**Background:** Psychological adjustment following an accidental injury is important for personal growth. We assessed the feasibility and short-term effects of a group-based disclosure intervention (GBDI) on posttraumatic growth (PTG) in Chinese patients with an accidental injury.

**Methods:** A quasi-experimental design with pre- and post-tests was used. Inpatients (N=36) were assigned to either the intervention (5 weekly 1-hour sessions involving the disclosure of their traumatic experience and related feelings) or usual care. The Chinese version of the Posttraumatic Growth Inventory, the Positive Affect and Negative Affect Schedule, the Event Related Rumination Inventory, the Emotion Regulation Questionnaire, and the Multi-dimensional Scale of Perceived Social Support were used as key outcome measures at Week 5. Participants were also interviewed about their perceptions of the GBDI program.

**Results:** The effect of the GBDI on PTG was compared based on whether previous disclosure had occurred. Overall, 40 of 44 patients (90.9%) participated, with 36 (90%) completing the study. The GBDI significantly improved PTG, positive affect, and cognitive reappraisal, while reducing rumination. Greater improvement was found in those who had not disclosed their experience prior to the intervention.

**Conclusions:** This study provides some evidence to support the use of the GBDI on patients with an accidental injury in China. The GBDI has the potential to be a useful intervention for accidentally injured patients in terms of improving their psychological adjustment and to provide clinical nurses with a potential approach to help patients positively adapt to a traumatic accident.

**Keywords:** Accidents; Disclosure; Group intervention; Posttraumatic growth

## INTRODUCTION

Injury due to an accident is one of the leading causes of disability and death in China (Ma & Liu, 2019). Accidental injuries are most common among young men, and can have an adverse effect on a survivor's physical and psychological wellbeing, such as the infliction of a long-term physical

disability, psychological distress, posttraumatic stress disorder (PTSD), and a lower quality of life (Guest, Tran, Gopinath, Cameron, & Craig, 2018; Papadakaki et al., 2017; Rissanen, Berg, & Hasselberg, 2017). However, there is evidence to suggest that some accident survivors experience positive changes as a result of struggling with their traumatic events (Dong, Gong, Jiang, Deng, & Liu, 2015; Roden-Foreman et al., 2018; Shah & Mishra, 2021), which is defined as posttraumatic growth (PTG) (Calhoun & Tedeschi, 2014). An increasing body of research has reported that PTG is associated with an enhanced quality of life, positive well-being and long-term life satisfaction (Gangeri et al., 2018; Veronese, Pepe, Massaiu, De Mol, & Robbins, 2017). While previous intervention studies have largely concentrated on reducing negative psychological symptoms, it has been proposed that doing so does not necessarily facilitate the growth-

<sup>a</sup>Ph.D. RN, School of nursing, Wenzhou Medical University, Wenzhou, Zhejiang, China. E-mail address: dcq1208@163.com

<sup>b</sup>RN, School of Nursing, Wenzhou Medical University, Wenzhou, Zhejiang, China E-mail address: 13616677382@qq.com

<sup>c</sup>RN, Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, Shanghai, China.

E-mail address: yangyangandamei999@163.com

Corresponding Author:

Chaoqun Dong

Contact address: School of nursing, Wenzhou Medical University, University Town, Chashan, Wenzhou, Zhejiang, China, 325035.

Telephone: +86 1585773010.

Fax: +86 577 86689836.

Email address: dcq1208@163.com

ORCID iD: <https://orcid.org/0000-0001-8944-609X>

related process and lead to positive adjustment (Joseph & Linley, 2008; Ramos et al., 2018). Therefore, it is important to help trauma survivors develop the ability to recognize the benefits of their traumatic experience.

It has been proposed that self-disclosure (Calhoun & Tedeschi, 2014) can potentially foster PTG in trauma survivors. Further, it has been suggested that emotional disclosure facilitates the process of growth by alleviating intrusive rumination (Leal-Soto, Carmona-Halty, & Ferrer-Urbina, 2016), fostering more constructive, deliberate rumination (Cafaro, Iani, Costantini, & Di Leo, 2019; Calhoun & Tedeschi, 2014), promoting positive reappraisal (Chu et al., 2020; Helgeson, Reynolds, & Tomich, 2006), and enhancing the recognition of social support (Chu et al., 2020; Tedeschi & Calhoun, 1996). However, the potential benefits of disclosure for psychological outcomes may be culturally dependent (Chu, Wong, & Lu, 2019). In individually-focused Western cultures, sharing trauma-related emotions with others is believed to promote subjective well-being, while expression of personal experience is regarded as inappropriate and immature in collectivistic cultures such as China (Ji et al., 2020; Uchida, Kitayama, Mesquita, Reyes, & Morling, 2008). Thus, research into the effects of disclosure in China is warranted. The objective of this study is to determine the feasibility and preliminary effects of a group-based disclosure intervention (GBDI) among Chinese patients with an accidental injury.

## LITERATURE REVIEW

Based on past research, there appears to be little difference between disclosure methods (e.g., expressive writing, private speaking, and speaking to others) in terms of promoting psychological adjustment (Slavin-Spenny, Cohen, Oberleitner, & Lumley, 2011). There is a growing body of literature that indicates that emotional disclosure in a written form is helpful in facilitating growth in those with PTSD (Chu, Wu, & Lu, 2020; Smyth, Hockemeyer, & Tulloch, 2008), women with breast cancer (Lu, Zheng, Young, Kagawa-Singer, & Loh, 2012; Ramos et al., 2018; Zhang, Chen, Zhang, Wang, & Li, 2020), cancer patients after adjuvant chemotherapy (Cafaro et al., 2019), and college students with unresolved stressful experiences (Slavin-Spenny et al., 2011). Zhang et al. (2020) revealed that a guided face-to-face self-disclosure intervention may promote the identification of benefits for Chinese breast cancer patients. However, it has been recently reported that written emotional disclosure failed to improve the psychological outcomes of

Chinese-American breast cancer survivors at a 6-month follow-up session (Gallagher, Long, Tsai, Stanton, & Lu, 2018; Lu et al., 2017). These unexpected results may be due to the traditional Chinese culture that discourages Chinese patients from disclosing their emotional distress.

Group-based intervention has been identified in a meta-analysis as an effective method for improving PTG (Roepke, 2015). Along these lines, Tedeschi and Calhoun (2004) suggested that PTG is more likely to occur when the group members in an intervention program have experienced the same trauma. For those who hesitate to talk, the group process may encourage disclosure by allowing patients to listen to similar others in the group who have experienced the same trauma and grown from it (Lutgendorf & Antoni, 1999). For example, Carmack et al. (2011) reported the feasibility of an expressive-disclosure group intervention for colorectal cancer patients, with an increase in the patients' positive feelings toward group members, greater willingness to discuss their trauma with others, and lower level of psychological distress. Another study suggested that emotional self-disclosure in an online support group can increase emotional support and willingness to continue participation (Malloch & Taylor, 2019).

A growing body of literature has also explored the effectiveness of emotional disclosure in the group-based interventions. For instance, Shakiba et al. (2020) incorporated emotional disclosure and communication into a cognitive-emotional group intervention, and found that the intervention had a significantly positive impact on PTG in mothers of children diagnosed with cancer. Similarly, a psychosocial group intervention designed to foster cognitive processing, a coherent personal narrative, and emotional disclosure was shown to be effective in promoting PTG in women with breast cancer at 6 months and at 12 months after intervention (Ramos et al., 2018). Meaning-centered group psychotherapy that encouraged adult cancer survivors to express the meaning of before and after cancer also demonstrated a long-term positive effect on PTG (Holtmaat et al., 2020). Recently, a pilot culturally sensitive group support intervention, which consisted of educational lectures and the disclosure of inner feelings to a peer mentor (Chu et al., 2020), also identified the potential benefit of promoting PTG for Chinese-American breast cancer survivors. However, a review of the literature failed to find studies that specifically explored the use of group-based disclosure for patients with an accidental injury in Chinese culture.

Therefore, this pilot study aimed to determine the feasibility and preliminary effects of a GBDI designed to improve PTG in Chinese patients who have experienced an accidental injury. We hypothesized that the GBDI would be associated with improvements in PTG, affect, cognitive and emotional processing (i.e., deliberate rumination and emotional regulation), and perceived social support. Our second aim was to explore the moderating effect of previous disclosure of their experience on PTG. Given that previous self-disclosure experience can predict the PTG of patients (Dong et al., 2015), we hypothesized that patients who had never talked about their thoughts and feelings associated with the traumatic event before the intervention would exhibit greater improvement in PTG after the intervention.

## MATERIAL AND METHODS

### Participants and procedures

Patients were referred to the study by clinical staff (physicians, nurses, and therapists) according to the following inclusion criteria: (a) aged 18-65 years, (b) a victim of an accident with a resulting physical injury, (c) willing and able to participate in the study, (d) cognitively intact, and (e) able to speak and understand Mandarin. Patients with a confused mental state or cognitive deficits due to their injury as determined by their physician were not eligible, nor were patients who were suffering from mental disorders or who experienced craniocerebral injury during the accident.

Participants were recruited from a rehabilitation hospital and the rehabilitation department of a comprehensive hospital between September 2018 and November 2018. Written informed consent was obtained from eligible participants who voluntarily enrolled in this study. Participants were recruited in cohorts to avoid group contamination. Recruitment for cohort 1, the intervention group, occurred in September 2018. All eligible participants were invited to participate until there were 20 participants enrolled. Cohort 2 (usual care [UC]) recruitment began in November 2018, approximately one month after recruitment of the first cohort was completed. Recruitment continued until another 20 eligible participants were enrolled. The purpose of recruiting the intervention group first was to reduce the influence of possible improvements in the knowledge and skill of the medical staff over time on the intervention effect.

On their initial visit, the participants provided demographic and injury-related information. Self-reported questionnaires for the outcome measures were completed at a baseline and during a follow-

up post-intervention assessment (five weeks after the baseline). In total, 44 eligible patients were approached, and 40 participants provided written consent to participate. Four participants dropped out of the study, leaving a total of 36 patients with an accidental injury (17 in the GBDI group and 19 in the UC group) who completed the study. This study was approved by the institutional review board of the medical university.

### Intervention

The GBDI consisted of five consecutive weekly one-hour sessions conducted by two registered nurses with master's degrees, with approximately 8-10 members in each group. Both were supervised by a nursing professor who helped to develop the GBDI. The GBDI involved the disclosure of the participants' traumatic experience and related thoughts and feelings, and facilitated discussion on topics identified in accordance with the instruction of emotional disclosure. A range of activities was offered in the GBDI. Session 1 focused on the group meeting each other, setting the goals and rules of the group, and sharing what happened during the accidents. Session 2 to 5 each consisted of two sections, as the disclosure of the traumatic event transitioned from focusing on external events to exploring the participants' internal feelings. The first section, (15-20 minutes) focused on pre-designed activities to elicit the participants' cognition and emotions, including (a) what should be known about rehabilitation, (b) the expression of thankfulness to important others, (c) singing to express feelings, and (d) looking back at cherished moments within the past four weeks. The second section of these sessions was 40-45 minutes. Participants were encouraged to explore how their trauma experience was related to the way they were dealing with their rehabilitation treatment and daily life, how the traumatic experience was related to their family and friends, how the experience related to positive changes in life, and how the experience was related to their work and future. Patients were encouraged to identify as many aspects of their feelings and thoughts about the traumatic event as possible.

The UC group did not follow any structured program; rather, the participants received standard medical and nursing care, rehabilitation, reading materials, and a social gathering for the clinic patients after completion of the baseline assessment.

### Measures

Feasibility was assessed using the number of

sessions that the participants attended, the attrition rate, and the consent rate. Participants in the GBDI group were also interviewed about their satisfaction with the intervention at the end of sessions.

Demographic and injury-related characteristics including age, gender, education, socioeconomic status, objective and subjective severity of the injury, and time since the accident, were assessed. The objective severity of the injury was assessed with the Injury Severity Score (ISS) using the Abbreviated Injury Scale (Adams & Carrubba, 1998). The subjective severity of the injury was measured with a self-rating scale, ranging from 1 (not at all severe) to 10 (extremely severe).

The previous disclosure of the experience of the accident was measured by asking one question: *"Have you talked about this accident and its consequences with others (family members, friends, medical staff, ward mates, etc.)?"* (Yes=1, No=0).

To evaluate the benefits of the intervention, the participants in both groups responded to five measures. All measures had acceptable reliability with a Cronbach's alpha ranging from 0.75 to 0.94. The Chinese version of the Posttraumatic Growth Inventory (Wang, Wang, Wang, Wu, & Liu, 2013), a 20-item scale, was administrated to assess the perceived positive changes after the accident. It is a six-point Likert scale with answers ranging from 0 (no change) to 5 (very great degree of change), and includes four subscales: new possibility, relating to others, appreciation of life, and personal strength. The Positive Affect and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988) was used to assess positive and negative affect over the week prior to the survey. The PANAS consists of two 10-item scales, and it has been validated in Chinese (Huang, Yang, & Li, 2003). The Event Related Rumination Inventory (ERRI) (Cann et al., 2011), a 20-item scale that includes intrusive rumination and deliberate rumination subscales, was used to measure the frequency of different types of rumination over the previous two weeks. The Chinese version of ERRI (Dong et al., 2015) has acceptable reliability. The Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003), the Chinese version of the 10-item scale, has been shown to have good psychometric properties (Dong & Guoliang, 2009). It was employed to assess emotional processing in two ways: cognitive reappraisal and expressive suppression. The Multi-dimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988) was employed to assess perceived social support from family members, friends, and significant others. The

12-item MSPSS has demonstrated acceptable reliability for the Chinese population (Chou, 2000).

### Data analysis

All statistical analyses were computed using SPSS Version 16.0 (SPSS Inc., Chicago, IL). Differences between groups were analyzed using independent-sample *t*-tests and chi-square tests. Subjective severity was controlled for in all outcome measures. The outcomes were analyzed using paired *t*-test and analysis of covariance (ANCOVA). The ANOVA model utilized the treatment group (GBDI vs. UC) as a fixed factor, and the baseline scores for the outcome variables as covariates. The outcomes were measured as the change in the score between the baseline and 5 weeks later at the end of the intervention. Partial eta squared ( $\eta^2$ ) was used to estimate the effect sizes, with  $\eta^2$  values of 0.01, 0.06, and 0.14 corresponding to small, medium and large effects for *Cohen's d*, respectively (Cohen, 1988). ANCOVA was also used to test the moderating effect of previous self-disclosure experience on the intervention effect as measured using the PTGI. The significance level was set at  $P < 0.05$  for the two-tailed tests.

For the qualitative data, content analysis was conducted independently by two coders using Nvivo 7 software (QRS International). Quotes from the interviews were translated into English.

## RESULTS

### General characteristics

The demographic and injury-related characteristics of the participants in the GBDI and UC groups are presented in Table 1. Of the 36 participants who completed the study, 29 were male and 7 were female. The average age of the participants was 34.7 years (SD, 11.9 years; range, 19 to 57 years). Those who dropped out did not differ significantly from those who completed the intervention in any of the variables measured at the baseline. As shown in Table 1, the baseline characteristics of the patients in the two groups were comparable, except for the subjective severity of the injury, with those in the GBDI group reporting a higher severity than those in the UC group ( $t=2.99$ ,  $P=0.005$ ).

### Feasibility

Of the 44 patients who were eligible and invited to participate, three declined because they had no interest in the study and 1 declined due to his busy schedule. In total, 40 consented to the study. Four of the 40 participants dropped out of the study

after giving consent. Of these, two were in the GBDI group, and they dropped due to scheduling difficulties. One participant in the GBDI group withdrew because they transferred to a hospital in another city, and one participant in the UC group could not be contacted after discharge. The majority of the participants in the GBDI group attended all of the sessions with the exception of one participant who missed two sessions due to a severe pressure ulcer that prevented him from attending, and another participant who missed one session due to a scheduling conflict.

The participants in this study all gave positive feedback about their experience in the GBDI and emphasized that they were more willing and comfortable to express their feelings and thoughts with others. Two examples of these comments are cited here:

*"Although we knew each other in the wards, but I didn't think it was good to tell others my own feeling. But it is strange that we could reveal our true feelings so naturally after talking about trivial things regarding our rehabilitation. The atmosphere was so harmonious that I didn't feel awkward to tell others how scared and vulnerable I was after the accident."*

*"At the very beginning, I was wondering whether there was anything to communicate with others about since I was so useless and disabled after the accident. Now I feel I have a common language with others, and they the other GBDI participants can understand my feelings well."*

### Exploratory outcomes

Descriptive statistics for the outcomes are presented in Table 2. The GBDI led to a significantly higher PTGI total score,  $F(1, 32) = 8.61, P = 0.006$ . All four of the GBDI subscales exhibited significant differences between the GBDI and UC groups: relating to others,  $F(1, 32) = 7.92, P = 0.008$ ; new possibility  $F(1, 32) = 6.88, P = 0.013$ ; personal strength  $F(1, 32) = 9.09, P = 0.005$ ; and appreciation of life  $F(1, 32) = 14.77, P = 0.001$ . From the baseline to the follow-up, the GBDI group demonstrated a significant increase in their PTGI score,  $t(16) = 2.58, P = 0.020$ , while that of the UC group decreased significantly,  $t(18) = -2.46, P = 0.024$ .

The scores for positive affect, cognitive reappraisal, and deliberate rumination were significantly higher in the GBDI group than in the UC group after the intervention: positive affect,  $F(1, 32) = 10.36, P = 0.016$ ; cognitive reappraisal  $F(1, 32) = 21.77, P < 0.001$ ; and deliberate rumination,  $F(1, 32) = 5.57, P = 0.034$ . There was a marginal difference in perceived social support between the two

groups,  $F(1, 32) = 3.87, P = 0.058$ . There were no significant improvements in negative affect, intrusive rumination, or emotional suppression in the GBDI group compared with the UC group.

It is noteworthy that the GBDI group demonstrated significant improvements in positive affect and cognitive reappraisal,  $t(16) = 2.17, P = 0.045$  and  $t(16) = 3.04, P = 0.008$ , respectively, while there was a significant decreases for the UC group in the following measures over time: positive affect,  $t(18) = -2.31, P = 0.033$ ; cognitive reappraisal,  $t(18) = -2.69, P = 0.015$ ; and perceived social support,  $t(18) = -2.96, P = 0.008$ .

### Influence of previous disclosure experience on the intervention effect

Eleven participants from the GBDI group and 15 participants from the UC group had previous disclosure experience. There was no significant difference in baseline disclosure between the groups (Table 1). A mixed model (ANCOVA) was employed to examine the influence of the previous experience of disclosure on the PTG response. This revealed a marginally significant interaction effect between the group and previous experience of disclosure,  $F(1, 31) = 5.69, P = 0.024$ , after controlling for the subjective severity. Participants who had not disclosed their traumatic events before the intervention exhibited more improvement in their PTG score post-intervention ( $\beta = -6.21, P = 0.010$ ), while previous disclosure experience was not related to a change in PTG in the UC group ( $\beta = 0.06, P = 0.785$ ). Figure 1 further illustrates the differences in the change in PTG depending on previous disclosure.

### DISCUSSION

Although recent evidence suggests that there is a preference for written over oral disclosure for stressful events, this study illustrates the feasibility and short-term benefits of oral disclosure in a group setting among Chinese patients who have experienced an accidental injury. The medium and large effect sizes ( $\eta^2 = 0.11 \sim 0.41$ ) associated with most of the study outcomes indicate that this approach is effective. The attendance rate for the group sessions and the drop-out rate were acceptable. Qualitative interviews revealed that most of the patients were positive about the group intervention, suggesting that disclosure to supportive members with similar traumatic experience, in conjunction with activities predesigned to elicit the participants' cognition and emotions, is an effective method for facilitating emotional disclosure in Chinese culture. While the



perceived social support in the GBDI group did not change following the intervention, the perceived social support in the control group decreased over time. The GBDI thus acted as a buffer to maintain the patients' perception of their social support. Without this buffer, the UC group experienced a drop in perceived social support between the beginning and end of the experiment. This was not unexpected given that the duration of a disability is associated with perceived social support (Fyrand, Moum, Finset, & Glennås, 2002).

Our findings are similar to previous studies of individually delivered disclosure intervention for non-Chinese patients (Crawley et al., 2018; Slavin-Spenny et al., 2011; Smyth et al., 2008; Stockton, Joseph, & Hunt, 2014). After five sessions of the GBDI, the total PTG score and its four subscales increased significantly compared to the UC group. Additionally, the results support the assumption that participants who had not talked about the traumatic event before the intervention benefited more from the GBDI program in terms of PTG, which aimed to encourage participants' emotional disclosure.

Positive affect, which is believed to be able to broaden one's mind (Lepore, Ragan, & Jones, 2000), was significantly higher in the GBDI group. Cognitive reappraisal, which has been identified as a precursor to PTG (Tedeschi & Calhoun, 1996), was also found to be improved by the intervention. These findings are in accordance with the theoretical hypothesis, suggesting that the disclosure of traumatic events provides an opportunity for individuals to reorganize the event cognitively, which enhances their positive emotion and personal growth. However, more research is needed to understand the mechanisms by which cognitive reappraisal and positive affect are involved in the development of PTG. Unlike previous results that reported emotional disclosure via writing could increase negative affect immediately after an intervention (Lu et al., 2012), our study found no significant change in negative affect post-GBDI. This indicates that emotional disclosure in a support group may be more effective for our target population because it does not increase distress. The results also suggest that development of PTG is not the same as the absence of psychological distress and negative emotions. Different types of intervention may be needed to target these psychological outcomes.

The inability of disclosure to reduce intrusive rumination conflicts with previous disclosure intervention studies (Lepore et al., 2000; Lutgendorf & Antoni, 1999; Ramos et al., 2018). In

our study, disclosure had no effect on intrusive rumination but did improve deliberate rumination. As such, these results are consistent with the social-cognitive processing model (Lepore, 2001). That is, the effect of disclosure on psychological health occurs by reducing the negative impact of intrusive rumination rather than by reducing the frequency of intrusive rumination. These findings also demonstrate that disclosure in a safe environment can promote participants' deliberate rumination, allowing them to make sense of traumatic events and foster posttraumatic adaption (Cann et al., 2011; Helgeson et al., 2006). There was no significant change in the participants' tendency to use expressive suppression as their emotional regulation strategy, which may be related to the cultural value place on expressive suppression.

### CLINICAL IMPLICATIONS

The GBDI provides clinical nurses with a potential approach to help patients positively adapt to traumatic accidents. The initial evidence of the effectiveness of the proposed intervention protocol provides information on how the GBDI leads to PTG in patients with an accidental injury, and can be extended to future clinical trials. This study also indicates that a group intervention offers a valid platform for the analysis of emotional disclosure. The GBDI has the potential to maximize the effectiveness of disclosure interventions on psychological health in Chinese culture. It is important for clinical staff to implement the GBDI with patients who have not yet discussed their feelings and thoughts after their accident.

### LIMITATIONS

This study has some limitations. First, it was limited by its small size, uneven groups, evaluation of short-term effects, and the non-randomized assignment of participants. Future studies should be conducted in a larger randomized-control trial with a longer follow-up period to examine the efficacy and retention of the treatment effects. In addition, this study was conducted among inpatients with an accidental injury in China, most of whom suffered a spinal cord injury; it is unclear whether the present findings can be generalized to other populations. Therefore, extending the GBDI program to patients of different cultures needs to be explored further. Third, previous disclosure was measured with a single question, which may not have provided enough information about the patient's relationship with the person they disclosed their feeling to, while the relatively low number of those who did not talk about their

experience with others may underestimate the effect of previous disclosure. Future research should employ a standard measure of disclosure in a larger sample to verify the moderating effect of previous disclosure. A final concern in interpreting the present findings is that an 'attention' effect may have arisen in the intervention group due to the unequal attention received by the two groups. Future studies should include an attention control group that receives group health education at the same frequency as the GBDI group to reduce this potential attention effect.

## CONCLUSION

To our knowledge, this is the first study that looks at PTG as an outcome of an intervention for Chinese patients with an accidental injury. Overall, the results demonstrated that the GBDI could significantly improve PTG, positive affect, deliberate rumination, and cognitive reappraisal. Considering the positive outcomes of this study and the positive feedback from the participants, the present pilot study provides evidence to support the feasibility of the GBDI in meeting the psychosocial needs of patients with an accidental injury in China.

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Table 1. Descriptive characteristic of participants at baseline by group

variables	categories	GBDI group (n=17)		UC group (n=19)		P <sup>†</sup>
		n(%)	Mean(SD)	n (%)	Mean(SD)	
Age, years			33.18(10.94)		36.00(12.88)	.486
Gender	male	15(88.2)		14(73.7)		.271
	female	2 (11.8)		5(26.3)		
Education level	Primary school or lower	1 (5.9)		2 (10.5)		.705
	Middle school	8 (47.1)		7 (36.8)		
	High school	3(17.6)		6 (31.6)		
	College or above	5(29.4)		4 (21.1)		
Financial status	≤3000 Chinese Yuan	6 (35.3)		11 (57.9)		.227
	3001-5000 Chinese Yuan	5 (29.4)		3 (15.8)		
	5001-8000 Chinese Yuan	2 (11.8)		4 (21.1)		
	>8000 Chinese Yuan	4 (23.5)		1 (5.3)		
the time since accident ,month			5.27(2.43)		5.70(3.73)	.686
Objective severity of injury			19.94(6.48)		18.58(4.51)	.475
Subjective severity of injury			8.65(1.00)		7.26(1.66)	.005
Accident types	Motor vehicle accident	4 (23.5)		5 (26.3)		.255
	Work-related injury	11 (64.7)		12(63.2)		
	Other accidents	2 (11.8)		2 (10.5)		
Injury type	Spinal cord injuries	12(70.6)		15(78.9)		.757
	Bone fractures	3(17.6)		3(15.8)		
	Other injuries	2(11.8)		1( 5.3)		
	Yes	11 (64.7)		15 (78.9)		.341
Past self-disclosure experience	No	6 (35.3)		4 (21.1)		

Note. SD= standard deviation. P<sup>†</sup>=Using  $\chi^2$  or t test for differences between two groups as appropriate.

Table 2. Baseline and follow-up scores on the health outcome variables by treatment group

Outcome variables	Time point	GBDI group(n=17)		UC group(n=19)		p	p $\eta^2$
		Mean	SD	Mean	SD		
Posttraumatic growth: total	Baseline	45.41	21.00	48.58	28.02	.006	.212
	Follow-up	59.00	13.30	35.89	24.63		
Relating to others	Baseline	10.70	5.44	10.53	5.71	.008	.198
	Follow-up	12.88	2.93	7.47	5.63		
New possibility	Baseline	9.53	6.13	11.53	9.17	.013	.177
	Follow-up	14.29	5.32	7.68	6.98		
Personal strength	Baseline	12.12	6.10	12.95	7.30	.005	.211
	Follow-up	15.29	4.45	9.05	5.84		
Appreciation of life	Baseline	13.06	5.87	13.42	7.54	.001	.316
	Follow-up	17.00	3.97	9.32	6.00		
Positive affect	Baseline	18.47	6.29	19.42	6.87	.016	.184
	Follow-up	21.35	4.92	16.69	5.84		
Negative affect	Baseline	20.00	3.69	20.37	5.53	.96	<.001
	Follow-up	19.29	4.88	19.89	5.23		
Intrusive rumination	Baseline	13.23	11.83	12.11	6.33	.480	.016
	Follow-up	12.29	8.27	11.84	6.03		
Deliberate rumination	Baseline	15.29	6.54	13.33	6.20	.034	.137
	Follow-up	15.94	7.85	10.67	4.83		
Cognitive reappraisal	Baseline	25.00	5.93	23.39	7.10	<.001	.434
	Follow-up	30.50	5.70	19.28	5.33		
Emotional suppression	Baseline	16.18	5.02	15.61	5.82	.256	.043
	Follow-up	16.56	3.74	13.94	4.95		
Perceived social support	Baseline	55.47	12.81	51.37	12.70	.058	.108
	Follow-up	55.47	10.76	43.68	10.76		

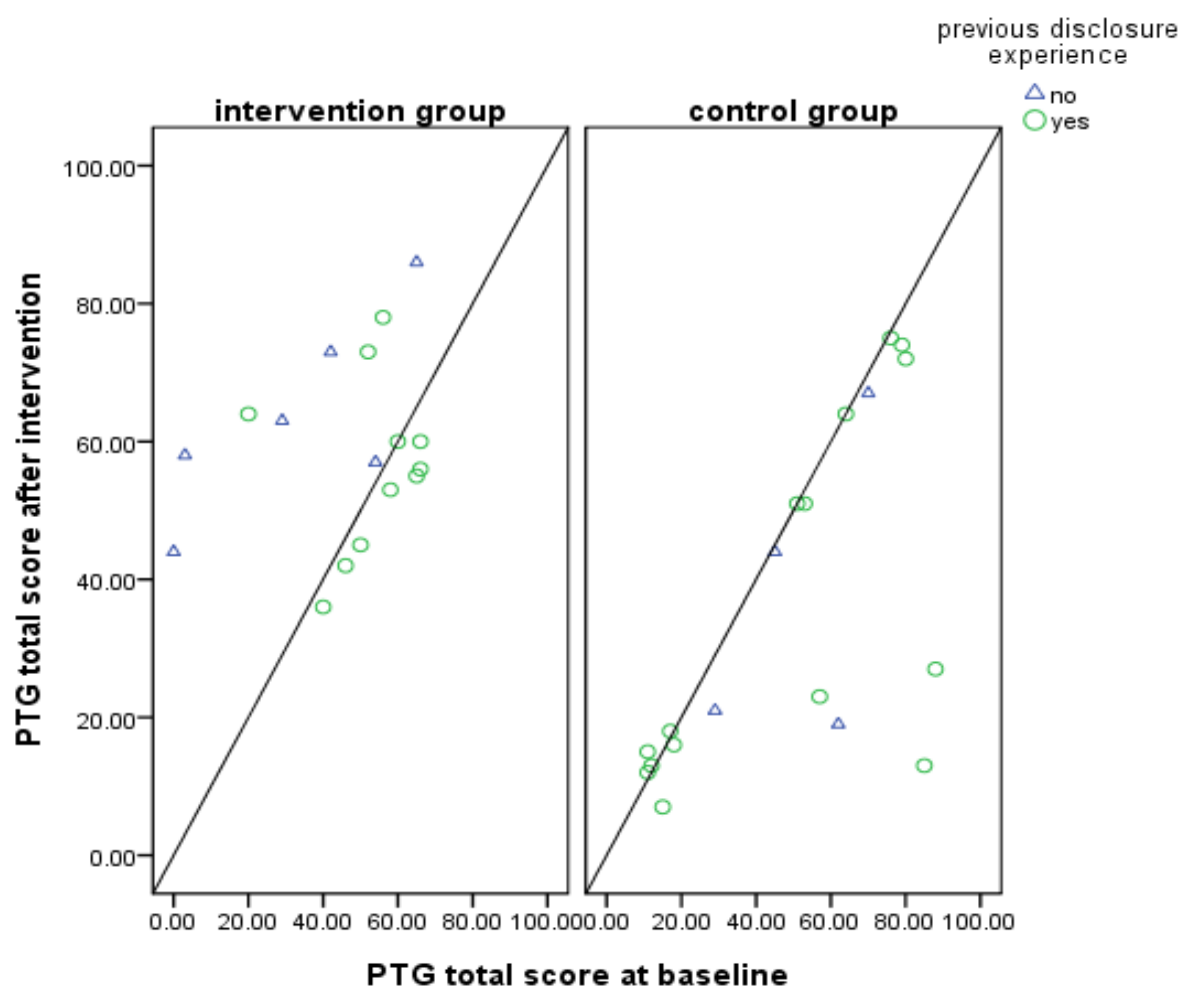


Figure 1. The total score of posttraumatic growth in two groups by patients with differently previous disclosure experience. The number of participants with previous disclosure verse without previous disclosure in the intervention group and control group is 11 vs 6, and 15 vs 4 respectively.