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Measuring Grief Following Miscarriage: Psychometric Properties of the Chinese Version of the Perinatal Grief Scale

Beatrice P. Y. Lai[1], Tony K. H. Chung[1], Dominic T. S. Lee[2], Grace W. S. Kong[1], and Ingrid H. Lok[1]

Abstract

Grief following miscarriage is a complex psychological response. This study was conducted to examine the psychometric properties of the Chinese version of the Perinatal Grief Scale (PGS). A total of 280 Chinese women completed the PGS immediately following a diagnosis of miscarriage (baseline) and were reassessed at 12 months follow-up. The factor structure of the Chinese PGS was explored. The convergent validity of the PGS was established by examining its correlations with the General Health Questionnaire–12 and Beck Depression Inventory at baseline. The reliability of the Chinese PGS was satisfactory. A two-factor structure accounting for 45% of the variance was identified. The Chinese PGS was positively correlated with General Health Questionnaire–12 and Beck Depression Inventory scores. The Chinese PGS was found to be a reliable and valid tool to measure grief following miscarriage.

Keywords

Perinatal Grief Scale, Chinese version, validity, reliability, miscarriage, grief

Miscarriage is one of the most common pregnancy complications. In Hong Kong, the percentage of first trimester miscarriages was reported to be 10% (Hong Kong College of Obstetricians and Gynaecologists, 2004). The loss of a baby can trigger intense emotional reactions, and grief is a frequent response to bereavement (Brown & Stoudemire, 1983). It is a dynamic and complex psychological state that usually begins with an initial state of shock, followed by preoccupation with the lost one, and ends in resolution (Beutel, Willner, Deckhardt, von Rag, & Weiner, 1996). The core emotions associated with grieving is the feeling of guilt, sadness, emptiness, and loss (Brown & Stoudemire, 1983). However, the absence of a visible "object" to mourn may make the grieving process more complex and difficult (Toedter, Lasker, & Alhadeff, 1988). The common occurrence and the procedural simplicity of the medical management also lead many health care professionals to overlook its impact (Lok & Neugebauer, 2007).

Toedter and her colleagues (Potvin, Lasker, & Toedter, 1989; Toedter et al., 1988) have developed the Perinatal Grief Scale (PGS) to assess grief specific to pregnancy-related loss. It includes three subscales. "Active grief" measures normal grief as it incorporates items regarding sadness, missing the baby, and crying for the loss. "Difficulty in coping" measures difficulty in coping with activities and other people. Individuals who score high on these items have compromised daily functioning and become withdrawn from others. "Despair" describes serious effects of the loss. Individuals who score high on these items are characterized by a seriously diminished meaning of life and a sense of hopelessness about themselves and their future. Thus, the three subscales can be conceptualized as representing increasing levels of severity of grief response to pregnancy loss.

Grief has much in common with depression. Both involve feelings of sadness, gloominess, emptiness, and undue self-blame. Previous studies found a close link between grief and depression or poor mental health among individuals experiencing perinatal loss (Potvin et al., 1989; Toedter et al., 1988). Thus, the present study attempted to establish the convergent validity of the PGS by exploring its correlation with depression as measured by the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and psychological distress as measured by the General Health Questionnaire–12 (GHQ-12; Goldberg, 1978).

The merit of the PGS is that it has been widely used in research studies in the United States and other countries, thus allowing for replication of previous research as well as comparisons to be made across studies. This scale has

[1]Department of Obstetrics and Gynaecology, The Chinese University of Hong Kong
[2]School of Public Health, The Chinese University of Hong Kong

Corresponding Author:
Beatrice P. Y. Lai, Division of Social Science, Hong Kong University of Science and Technology, Hong Kong SAR
Email: beatricelai@ust.hk

satisfactory reliability and validity (Toedter, Lasker, & Janssen, 2001). Yet its psychometric performance has not been validated in the Chinese population. The purpose of this study was to describe the reliability and validity of the Chinese version of the PGS among Hong Kong Chinese women.

Cross-cultural validation of the PGS is necessary because culture has been found to be an important element in shaping the grief process (Murphy & Merrell, 2009). Several beliefs embedded in the Chinese culture may make the grieving process following miscarriage difficult and complex for bereaved women. First, it remains at the core of Chinese ideology that womanhood is defined by one's ability to extend the familial lineage by giving birth to a child, preferably a male heir (Hsu, Tseng, & Kuo, 2002). Thus, pregnancy loss not only represents the loss of an expectant child but also a sense of loss of future and meaning of life. This sense of worthlessness, which is measured by the Despair subscale, may make the grieving process difficult and complicated. Second, Chinese people hold the notion that the mother is, at least partially, accountable for any pregnancy loss (Lee et al., 2009). Pregnant women must follow an array of dietary and behavioral taboos to safeguard the health and safety of the fetus (Dikotter, 1998; Lee et al., 2009). For example, vigorous movements such as climbing up and down should be avoided as these actions will destabilize the vital energy of the fetus, thus resulting in miscarriage (Lee et al., 2009). Thus, relatives and friends may blame the woman for failing to safeguard the fetus (Lee et al., 2009). Difficulties in social relationships and social withdrawal, which is measured by the Difficulty Coping subscale, may make the grieving process more complicated. All in all, these cultural beliefs may affect how the grieving process unfolds as well as the factor structure of the Chinese PGS. We speculate that items in the Difficulty Coping and Despair subscales may merge together to reflect Chinese cultural beliefs that make the bereavement process more complicated. Thus, the current study attempts to conduct a cross-cultural validation of the PGS to examine its reliability and validity in the Chinese context.

Method

This is a prospective, longitudinal study conducted in a university-affiliated hospital. Patients who had been admitted with a diagnosis of miscarriage during the 1-year recruitment period were approached to participate in the study. They were excluded if (a) they were unwilling to participate/give informed consent, (b) their follow-up observation was likely to be problematic because of immigration regulations or other factors, or (c) they had a history of psychiatric illness. The study was approved by the institute's ethics committee. Written informed consent was obtained from the participants after a description of the study.

Miscarriage was defined as pregnancy loss occurring spontaneously before 24 weeks of gestation. At baseline (i.e., immediately after the diagnosis of miscarriage was confirmed), participants' sociodemographic and clinical characteristics, including age, education level, employment status, parity, and current and past obstetric history, were collected by means of a semistructured interview. They were invited to complete three self-report scales, including the PGS, GHQ-12, and BDI.

At 12 months following the miscarriage, the PGS were sent to the participants again in addressed freepost envelopes to assess the test–retest reliability of the scale. Those who failed to complete or return the questionnaires were contacted by the research nurses via telephone or by mail (when telephone contact failed) to ensure maximal compliance. The 1-year test–retest period was chosen because the original authors (Potvin et al., 1989) used the same time interval to compute the test–retest reliability of the PGS. We wanted to compare the test–retest reliability of the Chinese PGS with the original version.

Instruments

The PGS is a 33-item self-report scale that is most widely used to measure grief specific to perinatal loss (Potvin et al., 1989). A professional translator translated the PGS into Chinese. Another independent professional translator subsequently back-translated the resultant items. The back-translated version was compared with the original PGS for comprehension and accuracy by one of the authors, who is an experienced bilingual psychiatrist. As a consequence, some items in the Chinese version were modified to better correspond to the original items. The items were further verified by back-translation until the meaning of the Chinese PGS corresponded with the original PGS. Participants were to rate their responses on a 5-point Likert-type scale. Higher scores indicate more intense grief following miscarriage.

The GHQ-12 is a 12-item self-report questionnaire originally developed to measure general psychological distress (Goldberg, 1978). It has been used for detecting psychological morbidity in the miscarriage population (Lok et al., 2004). A validated Chinese version was used in the study (Chan, 1985; Lok et al., 2004). We used the bimodal scoring method (0-0-1-1) and higher scores indicate greater psychological distress.

The BDI is a 21-item self-report rating scale developed to measure depressive symptoms (Beck, 1961). It has been used to assess depressive symptoms in the miscarriage population (Lok et al., 2004). The Chinese version of BDI has been validated and has demonstrated satisfactory psychometric properties (Shek, 1990). Participants were to indicate their responses out of four possible choices ranging in intensity. Higher scores indicate more intense depressive symptoms.

Statistical Analysis

Descriptive statistics including mean, standard deviation, and frequency of the participants' sociodemographic characteristics and psychological measures were reported. The sample was randomly divided into two halves using the "select case" option in SPSS 12.0. Exploratory factor analysis was generated with the first half of the sample (n = 145). A principal component exploratory factor analysis was performed using oblimin rotation as the three factors were found to be correlated in previous studies. The factor structure was then replicated in a confirmatory factor analysis with the other half of the sample (n = 135) using EQS 6.1 program (Bentler & Wu, 1995). The goodness of fit of the proposed model to the empirical data was evaluated using maximum likelihood chi-square goodness-of-fit test. A nonsignificant p value indicates that the model fits the empirical data. Since the chi-square test is sensitive to sample size as well as underlying structural and distributional assumptions, other goodness-of-fit indices were also used to assess model fit. These include root mean square error of approximation (RMSEA; values <.05 represent excellent model fit, values between .05 and .08 represent moderate fit, and values between .08 and .10 represent acceptable fit), normed fit index (NFI; values .90 or more indicate good fit), goodness-of-fit index (GFI; values .90 or more indicate good fit), and comparative fit index (CFI; values .90 or more indicate good fit).

Data collected at baseline with the total sample of 280 participants were used to estimate the internal consistency using Cronbach's alpha coefficients. Pearson's correlation coefficients between the PGS scores at baseline and 1-year follow-up were calculated to examine the test–retest reliability. To establish the convergent validity of the PGS, its correlations with BDI and GHQ at baseline were examined.

Results

Participant Characteristics

A total of 375 eligible females were invited to participate in the study over the 12-month recruitment period. Of these, 280 females agreed to participate. Thus, the overall response rate is 75%. At 1-year follow-up, 199 participants returned their questionnaires, yielding an attrition rate of 29%. The participants who defaulted at 1-year follow-up had higher educational attainment, were younger, had fewer children, and had been married for a shorter period of time than participants who completed the study (Table 1). The mean age of the overall sample was 32.6 years (SD = 5.7). The majority of them had secondary education or more. More than half of their pregnancies were planned and around 85% indicated they wanted the baby.

Exploratory Factor Analysis

The underlying factor structure of the PGS was examined by a principal component analysis with oblimin rotation. The KMO measure of sampling adequacy is .90, indicating the possibility of common factor(s). Bartlett's test of sphericity was statistically significant, $\chi^2 = 2967.83$ (528), $p = .00$, indicating adequate sampling and significant correlations among the variables. A two-factor structure accounting for 47% of the variance was identified (Factor 1 = 38%; Factor 2 = 9.6%). The factor loadings for each item are illustrated in Table 2.

After rotation, the items have moderate to strong loadings on the two factors. All items that loaded on Factor 1 originally belonged to the Difficulty Coping and Despair subscales except for Item 19, which originally belonged to the Active Grief subscale. All except four items (Items 2, 15, 23, and 25) that loaded on the second factor belonged to the Active Grief subscale. Items 2 and 25 originally belonged to the Difficulty subscale, whereas Items 15 and 23 originally belonged to the Despair subscale.

Several items were complex and had low factor loadings (<.30) on the two factors: Item 11, "I feel I have adjusted well to the loss" (Difficulty Coping); Item 33, "It feels great to be alive" (Difficulty Coping); Item 9, " I take medicine for my nerves" (Despair); Item 29, "It is safer not to love" (Despair); Item 32, "Being a bereaved parent means being a 'Second-Class Citizen'" (Despair). These items were excluded from the scale in subsequent analyses.

The correlation between the two factors was modest ($r = -.40$). The direction was negative as the factor loadings on Factor 1 were positive whereas the factor loadings on Factor 2 were negative.

Confirmatory Factor Analysis

The two-factor structure was replicated with confirmatory factor analysis with the other half of the sample (n = 135). The two factors were allowed to correlate and no correlated errors were included in the model. The chi-square statistic for the proposed model was $\chi^2(350) = 787.1$, $p < .01$. Although the chi-square test indicates that the model did not provide a good fit to the data, other goodness-of-fit indices suggested a satisfactory model fit (RMSEA = .058; NFI = .90; GFI = .91; CFI = .92).

To test whether alternative models will also provide reasonable fit to the data, we also tested the original three-factor model and the more parsimonious one-factor model. For the original three-factor model, the chi-square statistic was $\chi^2(492) = 1090.2$, $p < .01$. Other goodness-of-fit indices also suggested that the proposed model did not provide a reasonable fit to the data (RMSEA = .95; NFI = .622; GFI = .664; CFI = .749). For the one-factor model, the

Table 1. Sociodemographic Characteristics of Participants Who Completed the Study and Those Who Defaulted at 1-Year Follow-Up

	Total Sample (N = 280)		Participants Who Completed the Study (n = 199)		Participants Who Defaulted at 1-Year Follow-Up (n = 81)			
Characteristics	*n*	%	*n*	%	*n*	%	χ^2	*p* Value
Education level							9.17	.03
Primary	23	8.2	20	10.1	3	3.7		
Secondary	200	71.4	141	70.9	59	72.8		
Tertiary or above	57	20.3	35	17.6	19	23.4		
Employment status							1.80	.62
Homemaker	103	36.8	77	38.7	26	32.1		
Unemployed	4	1.4	3	1.5	1	1.2		
Retired	0	0	0	0	0	0		
Full-time	163	58.2	111	55.8	52	64.2		
Part-time	10	3.6	8	4.0	2	2.5		
Planned pregnancy							.28	.60
Yes	150	53.6	105	52.8	45	55.6		
No	129	46.1	94	47.2	35	43.2		
Wanted pregnancy							.00	.99
Yes	237	84.6	169	84.9	68	84.0		
No	42	15.0	30	15.1	12	14.8		
	Mean	*SD*	Mean	*SD*	Mean	*SD*	*t*	*p* Value
Age	32.6	5.7	33.2	5.6	31.1	5.6	–2.87	.00
Number of children	0.8	0.9	0.9	0.9	0.6	0.9	–2.87	.00
Duration of marriage (months)	81.2	76.2	88.6	82.0	63.2	56.3	–2.56	.01

chi-square statistic was $\chi^2(495) = 1323.4$, $p < .01$. Other goodness-of-fit indices also suggested that the proposed model did not provide a reasonable fit to the data (RMSEA = .112; NFI = .541; GFI = .541; CFI = .648). Thus, the two-factor model provides the most reasonable fit to the data. Subsequent analyses of reliability and convergent validity would be based on the proposed two-factor structure: Factor 1 as Complicated Bereavement and Factor 2 as Active Grief.

Reliability of the PGS

Data collected at baseline with the total sample of 280 participants were used to assess the internal consistency of the scale based on the proposed two-factor structure. Cronbach's alpha coefficients of the total scale and subscales were as follows: Total PGS (Cronbach's α = .94), Active Grief (Cronbach's α = .91), and Complicated Bereavement (Cronbach's α = .91). All the items were substantially linearly correlated with the underlying construct it was intended to measure (i.e., corrected item–scale correlation is 0.4 or more) except for Item 5, "I feel a need to talk about the baby" (r = .34 with Active Grief). However, deleting this item did not increase the internal consistency of the subscale.

Data collected from the 199 participants who responded for both baseline and 1-year follow-up were used to examine the test–retest reliability. The test–retest correlation coefficients for the subscales and total scale were as follows: Active Grief r = .48 (p = .00), Complicated Bereavement r = .38 (p = .00), Total PGS r = .46 (p = .00).

Correlations Among the PGS, GHQ-12, and BDI

To examine the convergent validity of the PGS, Pearson's correlation coefficients of the PGS, BDI, and GHQ-12 were examined. Both BDI and GHQ-12 had moderate correlations with all dimension of the PGS (r ranging from .55 to .62, $p < .01$; see Table 3).

Discussion

In a recent literature review of grief following miscarriage, Brier (2008) suggested that additional research is necessary to validate standardized measures of grief. To the best of our knowledge, the present study is one of the few endeavors to report on the psychometric properties of the Chinese PGS. This is important because there is a large Chinese

Table 2. Factor Loadings, Eigenvalues, and Percentage of Variance Extracted by Principal Component Analysis With Direct Oblimin Rotation

Item No.	Item	Subscale	Factor 1	Factor 2
1	I feel depressed	Active grief	.26	–**.80**
3	I feel empty inside	Active grief	.35	–**.62**
5	I feel a need to talk about the baby	Active grief	.19	–**.40**
6	I am grieving for the baby	Active grief	.28	–**.83**
7	I am frightened	Active grief	.33	–**.66**
10	I very much miss the baby	Active grief	.32	–**.85**
12	It is painful to recall memories of the loss	Active grief	.35	–**.87**
13	I get upset when I think about the baby	Active grief	.30	–**.84**
14	I cry when I think about him or her	Active grief	.34	–**.75**
19	Time passes so slowly since the baby died	Active grief	**.74**	–.32
27	I feel so lonely since he or she died	Active grief	.25	–**.47**
2	I find it hard to get along with certain people	Difficulty coping	.35	–**.67**
4	I can't keep up with my normal activities	Difficulty coping	**.51**	–.33
8	I have considered suicide since the loss	Difficulty coping	**.40**	–.18
11	I feel I have adjusted well to the loss	Difficulty coping	.11	.04
21	I have let people down since the baby died	Difficulty coping	**.73**	–.41
24	I get cross at my friends and relatives more than I should	Difficulty coping	**.49**	–.28
25	Sometimes I feel like I need a professional counselor to help me get my life back together again	Difficulty coping	.09	–**.44**
26	I feel as though I'm just existing and not really living since he or she died	Difficulty coping	**.57**	–.30
28	I feel somewhat apart and remote, even among friends	Difficulty coping	**.44**	–.25
30	I find it difficult to make decisions since the baby died	Difficulty coping	**.66**	–.37
33	It feels great to be alive	Difficulty coping	.11	.00
9	I take medicine for my nerves	Despair	.11	–.16
15	I feel guilty when I think about the baby	Despair	.33	–**.71**
16	I feel physically ill when I think about the baby	Despair	**.64**	–.52
17	I feel unprotected in a dangerous world since he or she died	Despair	**.74**	–.48
18	I try to laugh but nothing seems funny anymore	Despair	**.73**	–.43
20	The best part of me died with the baby	Despair	**.66**	–.42
22	I feel worthless since he or she died	Despair	**.68**	–.36
23	I blame myself for the baby's death	Despair	.35	–**.63**
29	It's safer not to love	Despair	.28	–.15
31	I worry about what my future will be like	Despair	**.46**	–.24
32	Being a bereaved parent means being a "Second-Class Citizen"	Despair	.30	–.30
Eigenvalues			12.74	3.16
Percentage of variance			38.16%	9.58%

Note: Factor loadings on the corresponding factor are in boldface

diaspora worldwide who have retained many aspects of their culture and language. In addition, it may serve as a template for research in mainland China. Preliminary data suggested that the PGS is a reliable and valid tool to assess grief following miscarriage.

Using a sample of Chinese women who has experienced miscarriage, our study found that the three-factor structure of the original PGS is not applicable. Instead, a two-factor structure is suggested for the Chinese version of the PGS. Most items loading onto the first factor belong to the Difficulty Coping and Despair subscales, whereas those items loading onto the second factor belong to the Active Grief subscale. Based on these factor loadings and the theoretical basis underlying the development of the original PGS, the first factor can be named as Complicated Bereavement as it captures a more severe form of grief responses. An

Table 3. Correlation Matrix of PGS, GHQ-12, and BDI

	1	2	3	4	5
1. GHQ	—				
2. BDI	.60**	—			
3. PGS—Active grief	.56**	.55**	—		
4. PGS—Complicated bereavement	.58**	.59**	.69**	—	
5. PGS—Total	.59**	.62**	.94**	.89**	—

Note. GHQ = General Health Questionnaire; BDI = Beck Depression Inventory; PGS = Perinatal Grief Scale.

initial validation study of the PGS, indeed, suggested that the Difficulty Coping and Despair subscales overlapped to a large extent. Potvin et al. (1989) found that half of the items on the Difficulty Coping subscale, although highly associated with this factor, shared more variance with the Despair factor. They suggested that these two subscales are useful in identifying individuals who might be at risk of severe grief.

Our results also indicated that items from the two subscales loaded onto the same factor, suggesting that Difficulty Coping and Despair together represents complicated bereavement. Items on the two subscales may load onto a common factor as they both reflect beliefs in the Chinese culture that makes the grieving process more difficult for bereaved mothers. Cultural antenatal taboos surrounding behavioral and dietary restrictions place the responsibility of safeguarding the fetus' health largely in the hands of the pregnant woman. Miscarriage is, at least partially, accountable to the bereaved mother's failure to abide by the cultural taboos, thus resulting in undue blaming by relatives and friends. Women under such pressure may find it difficult to cope with interpersonal relationships or may withdraw from social networks, thus making the grief process more difficult. These difficulties are measured by the items in the Difficulty Coping subscale, for example, "I have let people down since the baby died" and "I feel somewhat apart and remote, even among friends." In addition, a woman's identity and status in the family is determined to a certain extent by her ability to reproduce in order to provide the family with an heir. The loss of an expectant child represents a loss of future or a loss of meaning of life for the bereaved mother. This overwhelming sense of loss may also make the grief process more complicated. This is measured by the Despair subscale, for example, "I worry about what my future will be like" and "I feel worthless since he/she died." Therefore, the grieving process in the Chinese context might be rendered more difficult under the influence of cultural beliefs that were reflected by responses on the Difficulty Coping and Despair subscales. Thus, the two subscales merge together into a common factor that represents complicated bereavement.

On the other hand, the second factor can be named as Active Grief as it captures normal grief responses following bereavement. Examples of these responses include crying, missing the baby, and feeling painful when recalling memories of the loss. Further studies should continue to explore the underlying factor structure of the Chinese PGS using samples experiencing pregnancy-related loss other than miscarriage and at different assessment time points.

In addition to the emergence of a two-factor structure instead of the traditional three-factor structure, it is also of interest that some items have low factor loadings. "I feel I have adjusted well to the loss" and "It feels great to be alive" are items of positive affect, which may be less commonly expressed in the Chinese context. "I take medicine for my nerves" might not be commonly practiced in routine care settings. "It is safer not to love" might be ambiguous in meaning as reflected by some participants. "Being a bereaved parent means being a 'Second-Class Citizen'" may not be appropriate in the Hong Kong society where the majority of the population is Chinese and the concept of second-class citizen is not salient. These items are suggested to be excluded as they are circumscribed in specific cultural contexts and/or routine care settings, and thus, they are not culturally appropriate for the Chinese samples.

Based on the revised two-factor structure, we assessed the reliability and validity of the Chinese PGS. Cronbach's alpha coefficients of the two subscales and total PGS were all more than .90, suggesting that the Chinese PGS has satisfactory internal consistency. The reliability coefficients were similar to previous studies regardless of language, sample size, or type of pregnancy loss (Toedter et al., 2001). The average coefficients were .94 for total PGS, .92 for Active Grief, .89 for Difficulty Coping, and .88 for Despair in previous studies (Toedter et al., 2001). This suggested that the internal consistency of the revised two-factor Chinese PGS is comparable with the original version.

The test–retest correlation coefficients were moderate in the current sample. Since the PGS was not intended to measure a stable trait but rather a psychological state that declines over time, the test–retest coefficients is expected to be statistically significant yet not as high as the internal reliability coefficient (Toedter et al., 2001). The moderate correlation coefficients found in the present study supported this claim. Indeed, the test–retest reliability statistics were quite similar to the ones reported by Potvin et al.'s (1989) study. They computed the test–retest reliability of the PGS over a 1-year time interval, and the test–retest correlations for the three subscales and for the total scale ranged from .59 to .66, at a significance level of $p < .001$.

Total PGS and all subscales were positively correlated with psychological distress (GHQ) and depressive symptoms (BDI). Our results confirmed with previous studies, which also found higher PGS scores to be related to poorer mental health (Harrigan, Naber, Jensen, Tse, & Peres, 1993;

Potvin et al., 1989; Toedter et al., 1988). Thus, the Chinese PGS has satisfactory convergent validity.

The present study had several limitations. Our sample consisted of women experiencing miscarriage. It is uncertain whether the Chinese PGS performs satisfactorily in measuring grief among expectant fathers. In addition, it is uncertain whether the Chinese PGS is reliable and valid in assessing grief following other types of pregnancy-related loss such as ectopic pregnancy and fetal and neonatal death. However, miscarriage is by far the most common of these conditions. Future studies should validate the Chinese PGS by expanding the sample to incorporate expectant fathers and other types of pregnancy loss. Attrition bias may also be a potential problem as the participants who dropped out at 1-year follow-up had higher educational attainment, were younger, had fewer children, and had been married for shorter period of time than participants who completed the study. Further studies are warranted.

To conclude, the Chinese PGS is a reliable and valid instrument in assessing grief following miscarriage. We recommended a two-factor structure for the Chinese PGS in future studies with Chinese sample, namely, Active Grief and Complicated Bereavement. It can also be used as a tool to identify individuals at risk of psychological distress and depressive symptoms following miscarriage.

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