Resilience and social support promote posttraumatic growth of women with infertility: The mediating role of positive coping

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A B S T R A C T

According to previous research, clinical experience with individuals facing infertility has demonstrated that positive psychological changes can arise from the struggle involved (Paul et al., 2010), which is called posttraumatic growth (PTG). However, little knowledge has been gained about the relationships between PTG and its facilitating factors. The present study examined whether resilience and social support could predict PTG in women with infertility. The role of positive coping as a potential mediator was also assessed. Using a cross-sectional design, all members of a convenience sample of 182 women with infertility completed self-report measures of PTG, resilience, perceived social support, positive coping and background information. It was found that resilience, social support and positive coping positively correlated with PTG, which explained 34.0% of the total variance. The results suggested that positive coping partially mediated the impact of resilience on PTG while it totally mediated the relationship between social support and PTG. These findings demonstrated that, in clinical settings, improving positive coping in women with infertility may be helpful for the attainment of PTG.

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1. Introduction

Infertility is defined as the failure to achieve a successful pregnancy after 12 or more months of regular unprotected intercourse (ASRM, 2008). The World Health Organization estimates that 8–12% of couples around the world experience difficulty in conceiving a child (World Health Organization, 1991). In recent years, infertility has been on the rise in China. According to the ‘China Infertility Investigation Report’ in 2009, 12.5–15% of couples had difficulty in having a child. Moreover, this ratio showed an upward trend (China Population Association, 2009). Women are consistently found to be in greater distress than their male spouses when confronted with the crisis of infertility (Beaurepaire et al., 1994; Pottinger et al., 2006). Regardless of which one of the couple carries the reproductive impetus, it is most often the women who undergo the bulk of invasive procedures, are responsible for daily monitoring of their menstrual cycles and experience disruption in their schedules to accommodate rigid treatment regimens (Cousineau et al., 2006). The diagnosis of infertility, the time spent, the emotional toll of the treatment preparation and the medical interventions involved are extremely invasive (Bradow, 2012). It is usually unanticipated and may be unexplained, and the condition lasts for an indeterminate period of time (Forrest and Gilbert, 1992), which may challenge one’s concept of health, wholeness and physical integrity (Paul et al., 2010). Therefore, it is beyond dispute that infertility is quite traumatic. Many researchers believe that it is one of the most stressful events in patients’ lives (Domar et al., 1993; Herrmann et al., 2011). A considerable number of studies have consistently reported that infertility associates with psychological distress and losses of hope, esteem and social roles by repeatedly attempting to have a baby but failing to achieve it (Anderheim et al., 2005; Herrmann et al., 2011).

Nevertheless, increasing evidence indicates that positive changes following a trauma may be more common than maladaptive responses in the general population (Tedeschi and Calhoun, 2004). The term posttraumatic growth (PTG) has been introduced recently and is described as the experiences of growth arising from the struggle with these highly stressful life events (Tedeschi et al., 1998). Over the past 15 years, PTG has been documented extensively following a wide variety of highly stressful events. Clinical experience with couples facing infertility has also indicated that the struggle with infertility may offer an opportunity for positive changes. In a large-scale study on 2250 individuals dealing with challenged fertility, two-thirds of the participants strongly agreed or somewhat agreed that the infertility had brought the partners closer together and/or had strengthened the couples’ relationship (Schmidt et al., 2005). Paul et al. investigated PTG among 108 women and 13 men with infertility. It was found that participants had moderate degrees of PTG as a result of perceived severe
stressors, and there were positive associations between satisfaction with social support and two PTG factors (‘relating to others’ and ‘spiritual growth’).

A general model proposed by Tedeschi and Calhoun has identified that individual characteristics, social support and cognitive processing are important variables closely associated with positive changes (Tedeschi and Calhoun, 2004). Among these variables, social support is a common predictor included in many PTG studies. Several studies have reported that those with infertility often feel isolated and alienated and have difficulty in accessing social support (Hinton et al., 2010; Berger et al., 2013). According to Chinese culture, however, people have believed for a long time that a child is an indispensable part of a family, and also that it carries on the family line. Furthermore, interpersonal relationships have unusual significance for Chinese people (Chang and Holt, 1991).

Therefore, when infertility occurs, the whole family becomes involved and will use social resources to deal with the related problems. The importance of social support in helping women to deal with infertility treatment has also been highlighted (Martins et al., 2011). Social support from families, friends and significant others should be critical to help individuals with infertility through the stress of infertility. A study has suggested that professional social support can considerably reduce one’s feeling of abandonment, strengthen coping skills and modify views and habits towards treatment (Cwiek et al., 2009). Especially, warm and intimate relationships are an integral part for the attainment of PTG (Tedeschi and Calhoun, 2004). These lines of evidence indicate that perceived social support is an important predictor of PTG for Chinese women with infertility. However, no studies to date have examined how perceived social support influences individuals’ PTG in the Chinese context. In light of this, a recent study was conducted to examine the contribution of perceived social support to positive changes.

Resilience has been defined as the ability to adapt to or bounce back from extremely unfavourable circumstances (Carver, 1998; Tusaie and Dyer, 2004). It is also viewed as a personality trait that protects well-being during stressful conditions (Scali et al., 2012). As a protective factor against infertility-specific distress and impaired quality of life, resilience is associated with high scores on quality of life but with low scores on infertility problems for infertile men and women (Herrmann et al., 2011). Moreover, resilience is positively associated with growth (Bensimon, 2012). A study on 40 women from nine fertility clinics throughout the USA revealed that higher-resilient individuals were more likely to engage in active coping skills (Sexton et al., 2010).

Although PTG is not conceptualised as an adjustment to a traumatic event but rather as a response to a traumatic event, there appears to be a theoretical relationship between these two constructs, and this relationship may be mediated by coping (Schmidt et al., 2012). It was found that the use of active coping strategies, such as self-care behaviours, may limit the likelihood of disease acquisition and lead individuals to be more likely to adhere to health-care recommendations (Fife et al., 2008; Pence et al., 2008). Empirical research also revealed that personal strength and new possibility of PTG were strongly correlated with resilience, which can be regarded as an outcome of coping success (Nishi et al., 2010). Büyükaşık-Colak et al. (2012) reported that high-resilient individuals were more likely to use problem-focused coping strategies that, in turn, led to the development of PTG. In addition, social support may be a precursor of personal growth by influencing coping behaviours (Schaefer and Moos, 1998). When individuals perceived greater levels of social support, they could demonstrate better adaptation to traumatic events and gain more positive changes (Seidalmohmmadi et al., 2011). These findings suggested that positive coping may play a critical role in the links between resilience, social support and PTG.

2. Methods

2.1. Participants and procedures

Ethics approval by the Ethics Committee of Third Military Medical University was obtained prior to the commencement of this study. Between October 2011 and September 2012, selected by random convenience, a sample of 194 women diagnosed with infertility was recruited from the infertility outpatient clinics at Southwest Hospital in Chongqing, China. The inclusion criteria for the participants were as follows: (1) at least 6 months post diagnosis, (2) still actively attempting to have a child, (3) able to read and understand the questionnaires, (4) having provided informed consent to participate in the present study and (5) self-reported absence of non-infertility-related current or recent-past crises (e.g., death and serious physiological or mental illness in family).

The purposes of this study and the degree of participation were explained to all participants. They were assured that anonymity and confidentiality would be maintained. Each participant was asked to complete a separate response booklet with structured and self-reported questionnaires. Data from 12 participants were excluded because these participants failed to respond to all of the items on the survey. The final sample included 182 participants. All participants filled in the questionnaires in the waiting area or reception and handed them in on the spot.

2.2. Study measures

Five self-report instruments were used in this study, including the Posttraumatic Growth Inventory (PTGI), the Connor–Davidson Resilience Scale (CD-RISC), the Perceived Social Support Scale (PSS), the Positive Coping Style Questionnaire (SCQ-P) and a background survey.

2.2.1. Posttraumatic Growth Inventory

The Chinese version of the PTGI (Tedeschi and Calhoun, 1996), is a 21-item scale to assess the degree of reported positive changes experienced in the struggle with a traumatic event. It measures growth across five domains: new possibilities, changed relationships, appreciation of life, personal strength and spiritual changes. Participants rated their experience of growth on a six-point Likert scale ranging from 0 (not at all) to 5 (very much). For the total scale, coefficient alpha was 0.901 in this study, which confirmed a high level of reliability.

2.2.2. Resilience Scale

The CD-RISC (Connor and Davidson, 2003) comprises 25 items rated on a five-point Likert scale from 0 (not true at all) to 4 (exactly true), with higher scores reflecting greater resilience. It has demonstrated adequate internal consistency, test–retest reliability and convergent and divergent validity in general population and patient samples. The Chinese version showed good psychometric properties (Yu and Zhang, 2007). Coefficient alpha was computed to be 0.870 in this study, an indication of good reliability.

2.2.3. Positive Coping Questionnaire

In recent years, several measures of coping have been developed. Among them, the 66-item Ways of Coping Questionnaire (WCQ) (Folkman and Lazarus, 1988) and the 30-item Coping Style Questionnaire (CSQ) (Carver et al., 1989) are the most widely used versions. However, Chinese researchers found that these versions are not suitable for Chinese population as the factor analysis results are not consistent. Therefore, we used the Simplified Coping Style Questionnaire (SCQ) (Xie, 1998) in this study. The SCQ contains 20 items that measure two coping styles of positive coping (12 items, e.g., I try to think of different ways to solve a specific problem)
analysed with SPSS 18.0 software package. The data were

2.3. Data analyses

Pearson correlation analysis was conducted to describe the associations of the study variables. A T-test was used to evaluate differences of the main results presented in this study and previously reported results. Regression analysis was performed to examine the contributions of resilience, social support and positive coping to PTG. Sobel’s z test was conducted to verify the mediating role of positive coping in the associations of PTG with resilience and social support. The data were analysed with SPSS 18.0 software package.

3. Results

3.1. Preliminary analyses

The ages of the 182 participants ranged from 21 to 46 years (mean = 30.5, standard deviation (S.D.) = 5.1). Among them, 76 (41.8%) were educated up to less than high school, 36 (19.8%) had completed high school, 37 (20.3%) had attained junior college degrees and 33 (18.1%) had bachelor's degrees or higher. Infertility duration was assessed by the categories mentioned earlier. Of the participants, 57 (31.32%) had 6–24 months' infertility duration, 54 (29.67%) had 24–60 months, and 71 (39.01%) had more than 60 months.

Means and S.D.’s for all measures are shown in Table 1. The mean PTGI total score indicated these infertile participants reported a small degree of positive benefits (scored 2.03 on a 0–5 scale). A one-sample t-test showed that the mean PTG score for women with infertility in this study was lower than that reported by Paul et al. (Mean = 51.79, S.D. = 23.40; t = −7.409, P < 0.001) (Paul et al., 2010). Participants rated resilience higher than the middle point on the scale (scored 2.43 on a 0–4 scale), however, significantly lower than that of the general population (Mean = 80.40, S.D. = 12.80; t = −21.243, P < 0.001) described by Connor and Davidson (Connor and Davidson, 2003). Social support and positive coping were rated higher than the middle points on these dimensions.

3.2. Associations of study variables

Correlation analyses were conducted to assess possible associations between demographic characteristics (age, education level and infertility duration) and PTG. None of the demographic variables were correlated with PTG (all Ps > 0.05). Table 1 summarises Pearson correlations between the main study variables. There were significant relationships between PTG and resilience, positive coping and social support (all Ps < 0.01). Among these variables, the variable most highly correlated with PTG was positive coping, followed by resilience and social support. Similar results were obtained for all five factors of the PTGI (all Ps < 0.05). These findings support the hypothesis (1) that PTG is positively associated with resilience, social support and positive coping. In addition, significant positive correlations were found among resilience, positive coping, and social support (all Ps < 0.01).

A hierarchical linear regression analysis was conducted to examine the effects of resilience, social support and positive coping on PTG. Three covariates were entered in the first step. Resilience and social support were entered in step 2. As detailed in Table 2, greater resilience and more social support predicted a higher PTG score. When it was introduced in the third step, the main effect of positive coping on the PTG score demonstrated statistical significance (B = 1.163, P < 0.001). Resilience, social support and positive coping could explain 34.0% of the total variance in PTG. These findings lent support to the hypothesis (2) that resilience, social support and positive coping significantly predicted the level of PTG.

3.3. The mediating role of positive coping

In order to examine whether positive coping is a mediator of the relationship between resilience and PTG, tests of mediation were performed according to the procedure set by Baron and Kenny (Baron and Kenny, 1986). The unstandardised coefficient and standard error (S.E.) for the pathway from the predictor to the mediator were determined by regressing positive coping onto resilience, controlling for age, infertility duration, education and social support (B = 0.210, S.E. = 0.029, P < 0.001). The unstandardised coefficient and S.E. for the pathway from the mediator to the dependent variable were derived by regressing PTG onto positive coping (B = 1.163, S.E. = 0.539).

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Mean (S.D.)</th>
<th>Possible range</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total PTGI</td>
<td>42.55 (16.83)</td>
<td>0–105</td>
<td>1</td>
<td>0.480**</td>
<td>0.297**</td>
<td>0.539**</td>
</tr>
<tr>
<td>Relating to others</td>
<td>15.24 (6.50)</td>
<td>0–35</td>
<td>0.910**</td>
<td>0.365**</td>
<td>0.266**</td>
<td>0.441**</td>
</tr>
<tr>
<td>New possibilities</td>
<td>10.38 (4.58)</td>
<td>0–25</td>
<td>0.883**</td>
<td>0.438**</td>
<td>0.255**</td>
<td>0.485**</td>
</tr>
<tr>
<td>Personal strength</td>
<td>8.12 (4.15)</td>
<td>0–20</td>
<td>0.891**</td>
<td>0.499**</td>
<td>0.301**</td>
<td>0.461**</td>
</tr>
<tr>
<td>Spiritual change</td>
<td>3.25 (2.08)</td>
<td>0–10</td>
<td>0.653**</td>
<td>0.270**</td>
<td>0.150**</td>
<td>0.343**</td>
</tr>
<tr>
<td>Appreciation of life</td>
<td>5.55 (2.63)</td>
<td>0–15</td>
<td>0.690**</td>
<td>0.347**</td>
<td>0.196**</td>
<td>0.362**</td>
</tr>
<tr>
<td>2. Resilience</td>
<td>60.86 (12.41)</td>
<td>0–100</td>
<td>0.330**</td>
<td>0.530**</td>
<td>0.429**</td>
<td></td>
</tr>
<tr>
<td>3. Social support</td>
<td>63.46 (11.61)</td>
<td>12–84</td>
<td></td>
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</tr>
<tr>
<td>4. Positive coping</td>
<td>23.43 (5.75)</td>
<td>0–36</td>
<td></td>
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</table>

Note: N = 182.

* P < 0.05.

** P < 0.01.
Hierarchical regression analysis: prediction of posttraumatic growth.

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
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<tbody>
<tr>
<td></td>
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<td></td>
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<tr>
<td>B</td>
<td>S.E.</td>
<td>t</td>
</tr>
<tr>
<td>Age</td>
<td>0.018</td>
<td>0.265</td>
</tr>
<tr>
<td>Infertility duration</td>
<td>1.290</td>
<td>1.668</td>
</tr>
<tr>
<td>Education</td>
<td>0.218</td>
<td>1.132</td>
</tr>
<tr>
<td>Resilience</td>
<td>0.097</td>
<td>0.998</td>
</tr>
<tr>
<td>Social support</td>
<td>0.230</td>
<td>0.102</td>
</tr>
<tr>
<td>Positive coping</td>
<td></td>
<td></td>
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<tr>
<td>(R^2)</td>
<td>0.004</td>
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</tr>
<tr>
<td>(\Delta R^2)</td>
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<tr>
<td>*(F)</td>
<td>0.251</td>
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</table>

<table>
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<tr>
<th>Note:</th>
<th>N = 182; B = unstandardized regression coefficient; (\Delta R^2) = variance explained in the step of regression analysis.</th>
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<tbody>
<tr>
<td>* P &lt; 0.05.</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>** P &lt; 0.01.</td>
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<tr>
<td>*** P &lt; 0.001.</td>
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</table>

= 0.239, \(P < 0.001\), along with the same covariates and resilience. In this model, positive coping and resilience significantly predicted PTG. However, after accounting for the effect of positive coping, the link between resilience and PTG became weaker (from \(B = 0.607, P < 0.001\) to \(B = 0.363, P < 0.01\)). The results of the Sobel test for mediation indicated that the indirect association between resilience and PTG through positive coping was significant \((z = 4.039, P < 0.001)\). The conditions for complete mediation were satisfied on positive coping as a mediator between resilience and PTG.

The effect of positive coping as a mediator in the relationship between social support and PTG was also analysed. The unstandardised coefficient and S.E. for the pathway from social support to positive coping were determined by regressing positive coping onto social support, controlling for age, infertility duration, education and resilience \((B = 0.133, S.E. = 0.030, P < 0.001)\). The unstandardised coefficient and S.E. for the pathway were derived by regressing PTG onto positive coping \((B = 1.163, S.E. = 0.239, P < 0.001)\), which was same as the test of the mediating role of positive coping in the relationship between resilience and PTG. Upon introducing positive coping into the model, we found that the link between social support and PTG was no longer significant \((B = 0.230, P < 0.05\) to \(B = 0.075, P > 0.05\)). The results of the Sobel test for mediation indicated that the indirect association between social support and PTG through positive coping was significant \((z = 3.277, P < 0.01)\), supporting the statement that positive coping totally mediates the relationship between social support and PTG.

4. Discussion

The results of this study suggested that PTG levels of Chinese women with infertility were almost similar to those in prior studies based on women post partum \((mean = 39.81, S.D. = 24.06)\) (Sawyer et al., 2012), colorectal cancer survivors \((mean = 43.80, S.D. = 29.60)\) (Salsman et al., 2009) and survivors after severe motor vehicle accidents \((mean = 37.88, S.D. = 16.88)\) (Rabe et al., 2006). However, the total PTG scores in this study were lower than those of individuals with infertility reported previously (Paul et al., 2010). The mean score of resilience was lower than that observed in the general population, which revealed that professional counselling and psychological intervention are needed to help Chinese women with infertility to improve the levels of resilience for the sake of facilitating their PTG.

These findings clearly support the hypothesis that resilience, social support and positive coping are associated with PTG. It was also verified that positive coping is more closely related to PTG than resilience and social support. PTG could be evidently predicted by resilience and positive coping, which is consistent with previous studies (Bensimon, 2012; Swichert and Hittner, 2009). Meanwhile, social support emerged as another significant predictor of increased PTG in Chinese women with infertility. This might actually help to partly explain the finding that individuals who have experienced adverse events and received support from others tend to report feelings of closeness towards significant others (McMillen, 1999; Taylor et al., 2000). In our study, the contribution of positive coping to PTG was found to be above and beyond the effects of resilience and social support. It agrees with previous literature, which highlighted the importance of coping strategies in facilitating PTG (Garnefski et al., 2008; Park and Helgeson, 2006). Furthermore, it was proved that positive coping significantly carried the influences of resilience and social support to PTG. These results demonstrated that higher resilience and more social support might enhance the level of positive coping that would, in turn, facilitate PTG for women with infertility.

However, some limitations of this study should be taken into account. First, the current sample was relatively small and the results were based on only Chinese women with infertility. Our results need to be replicated and verified in other populations. Second, we failed to collect some demographic information such as employment status and household income, which may be related to the development of PTG. Third, the attainment of PTG needs a period of time. Thus, a cross-sectional study cannot rigorously demonstrate the dynamic process. A longitudinal design with randomised samples should be conducted to examine the dynamic development of relationships between resilience, social support, positive coping and PTG in women with infertility in future studies.

Despite these limitations, current findings demonstrated that these protective factors including resilience, social support and positive coping are critical for enhancing PTG levels. In addition, positive coping has a mediating role in positive effects of resilience and social support on PTG. Accordingly, our study fills a part of the present knowledge gap. In this context, it is essential to learn how to effectively enhance their levels of resilience, gain more social support, choose more positive coping strategies and, therefore, promote PTG for women with infertility. These findings have significant implications for clinical practice and research, which may offer guidance on professional counselling and psychological interventions for women experiencing infertility.

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