The psychometric properties of the Dyadic Coping Inventory (DCI)

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Abstract

A survey conducted by The Indonesian Central Bureau of Statistics (Badan Pusat Statistik/BPS Indonesia) last year has found that the divorce rate in Indonesia had increased up to 53,50% compared to the data in 2020, and more than half of the divorce cases happened because of "unsolved conflicts between couples". Out of various studies on marital or romantic relationships done internationally, it suggests that dyadic coping could be the protective factor in the relationship between stress and the couples' well-being. According to a meta-analysis study held in 2015 along with systematic literature reviews published in 2019 and 2022 regarding the construct, the Systemic Transactional Model (STM) of dyadic coping proposed by Guy Bodenmann, as well as the instrument used to measure it, the Dyadic Coping Inventory/DCI (also developed from the same model), are considered the most frequently used model and instrument in assessing dyadic coping together with other related construct (e.g., relationship satisfaction). The Dyadic Coping Inventory has been translated into 25 languages and has been adapted in 14 countries. Unfortunately, this instrument had only been translated from English to Indonesian and had not been tested, specifically for its validity and reliability on the Indonesian population. The purpose of this study is to examine the psychometric property of the Indonesian version of Dyadic Coping Inventory. The study is conducted by following the International Test Commission (ITC) guidelines for translating and adapting tests (2017). A total of 104 participants were involved in this research (during pilot study). Results showed that the instrument has an overall high internal consistency (α = .93). Evidence for validity based on content and response processes were also acquired through experts' judgement and cognitive interviews. Further studies should include a larger sample size to test the Indonesian version of DCI and perform a factorial analysis (validity based on internal structure).

Introduction

The unsolved conflicts between couples in Indonesia

A survey conducted by The Indonesian Central Bureau of Statistics (Badan Pusat Statistik/BPS Indonesia) last year has found that the divorce rate in Indonesia had increased up to 53,50% compared to the data in 2020 (±447.743 cases), and more than half of the divorce cases (±279.205 cases) happened because of "unsolved conflicts between couples" (Annur, 2022; Jayani, 2021). According to ICD 10, how parents deal with stress can be a risk factor for their children's development. Bronfenbrenner's theory

of ecological systems also explains how various social environments (e.g., the micro-system) could affects a child's development, which he called 'the transactional influence' (Lerner & Damon, 2006; Rosa & Tudge, 2013; Tudge & Rosa, 2020). The act of modelling is one of the earliest methods for children to learn about their surroundings (Crain, 2014). Parents are often said to be one of the sources of that modelling, As the child grows up, the result of the modelling might develop into something more permanent like the child's habits, personality traits, or social competence (Murray & Farrington, 2005; Scaglioni et al., 2018). There's also the classic nature-versus-nurture debate. Physiologically speaking, humans have that innate fight-or-flight stress response, but as the epigenetics perspective emerges, which stress response we dominantly use in daily life or life-threatening situation could be influenced by our surroundings (Boyce, 2019). All of the previous findings take us back to the parents.

Dyadic coping as the protective factor

There are a lot of models of dyadic coping, but the one being used in this study is the systemic transactional model (STM) developed by Guy Bodenmann (1995), as well as the instrument used to measure it, the Dyadic Coping Inventory (DCI) (Bodenmann, 2008a). Based on a meta-analysis study held in 2015 along with systematic literature reviews published in 2019 and 2022 regarding the construct, the model and instrument developed by Bodenmann are considered the most frequently used model and instrument in assessing dyadic coping together with other related construct (e.g., relationship satisfaction) (Bodenmann et al., 2019; Falconier et al., 2015; Nepomuceno et al., 2022).

According to the Systemic Transactional Model/STM (Bodenmann, 1995; Kayser & Bodenmann, 2005), the process of dyadic coping (DC) starts with 'stress communication', It happens when one partner sends stress signals verbally (e.g., complaining about work) or non-verbally (through facial expressions or behavior). The other partner then assesses what the partner is going through and decides whether to give positive or negative dyadic coping.

The positive and negative dyadic coping can each be further specified (Bodenmann et al., 2019; Kayser & Bodenmann, 2005). Positive dyadic coping includes supportive dyadic coping (SDC), which occurs when one shows empathy and help his/her partner by giving practical solution; delegated dyadic coping (DDC) occurs when one takes over his/her partner regular activities in order to help; partners could also engage in common dyadic coping (CDC), this form of dyadic coping occurs when both partners try to deal with stress together.

Negative dyadic coping (NDC) is characterized by behaviors such as forcing oneself to give support to the partner, withdrawing from the partner in times of need, and/or insulting the partner verbally/non-verbally. While literature about the negative dyadic coping is scarce, some of studies found that this form dyadic coping tends to be shown through verbal aggression, anger, having insomnia, and social dysfunction in men and women (Bodenmann et al., 2010, 2011).

As of the present, the model and instrument measuring dyadic coping proposed by Bodenmann is the only one that measures couples' coping with daily stressors. While the other models and instruments available, were often developed from studies involving couples' coping with chronic illnesses, this condition would create different type of stress that might need different kind of coping. In Indonesia itself, the dyadic coping had often been examined in studies involving couples coping with chronic illnesses or mental

disorders (Nurnaningsih et al., 2018; Purba & Risnawaty, 2021). Cutrona et al., (2018) provided a review on the difference between dyadic coping and other similar construct (e.g., social support).

Psychometric properties of the Dyadic Coping Inventory (DCI)

The Dyadic Coping Inventory is a self-administered questionnaire with 37 items. It is a 5-point Likert scale. Participants can rate their response to each question by choosing 1 (very rarely/never) to 5 (very often/always) options. It takes about 10-15 minutes to complete the scale. For scoring, the instruction given by the manual (Bodenmann, 2008b) is to sum up items 1-35 after reverse coding the items from negative dyadic coping dimension. The last two items are not included in the scoring as both are only evaluation items.

The original DCI has high internal consistency for its subscales with α ranging from .71 till .92 (Bodenmann, 2008a). Most of the adapted versions of DCI also have overall high internal consistency with α above .80 (Nepomuceno et al., 2022).

As for validity, it was first tested using Principal Component Analysis (PCA) on data collected from German, Italian, and French samples. It had over 50% of the variance explained, respectively (Bodenmann, 2008b). Most of the studies adapting DCI in different countries used Confirmatory Factor Analysis or CFA and it resulted in a 5 + 5 + 2 structure (Nepomuceno et al., 2022). From these results, it can be seen that this instrument can measures coping from one's own perspective and the partner's perspective and so it showed the 5 + 5 factors. Almost all of the adaptation studies also divided the positive dyadic coping into problem-focused and emotion-focused coping hence the last 2 factors. In some of the meta-analysis studies, it turned out that dyadic coping correlated strongly and positively to marital quality and relationship satisfaction (Bodenmann, 2008a; Falconier et al., 2015). These could be the evidence for convergent validity of dyadic coping.

The purpose of this study

Based on the benefits of having couples do dyadic coping, its effect on the relationships' well-being, and possibly children's development, we try to examine the Indonesian version of the Dyadic Coping Inventory, so that a valid and reliable instrument can be used in further studies.

Method

We conducted the study by following the International Test Commisions (2017) guidelines for translating and adapting tests. We received both permission and the Indonesian translation of DCI from the original author. The Indonesian translation DCI was translated by another researcher in a non-psychometric study a few years ago (Dermawan et al., 2015). We continued working on the translated version by doing the next steps, which were backward translation until pilot study.

Participant

Several participants were recruited to take part in cognitive interviews (validity based on response processes) and ±100 participants were involved in the pilot study. They had to fulfill two criteria to participate in the study; (1) an Indonesian citizen, and (2) have been married for at least 2 years. All of the participants were recruited through social media, and they gave signed informed consent before participating.

We also collected sociodemographic data during the pilot study. A total of 104 participants with 61.5% men (n = 64) and 38.5% women (n = 40) were involved in the study. 13.5% (n = 14) were aged 20-30, 25% (n = 26) were aged 31-40, 49.5% (n = 51) were aged 41-50, and 12% (n = 13) were aged 51-60. 76% (n = 65) were of Javanese ethnicity. As of educational background, 8.7% (n = 9) graduated high school, 9.6% (n = 10) got a diploma, 49% (n = 51) got a bachelor's degree, and 32.7% (n = 34) got their master's degree. For marriage duration, about 69.2% (n = 52) have been married for more than 10 years, 28.8% (n = 30) have been married for 2-10 years, while 1.9% (n = 2) have been married for more than 30 years. Lastly, 74.1% (n = 77) of the participants have more than 2 kids.

Measures

Sociodemographic variables

We asked for the participants sociodemographic data before they started filling the questionnaire. Some of the data collected were of their gender, age, ethnicity, educational background, marriage duration, and number of kids.

The Dyadic Coping Inventory (DCI)

The DCI developed by (Bodenmann, 2008a) consisted of 37 items. It's a self-administered questionnaire with 5-point Likert scale. The dimensions measured in the instrument are based on items reflecting stress communication (SC = 8 items), forms of dyadic coping (SDC = 10 items; DDC = 4 items, CDC = 5 items; and NDC = 8 items) and evaluation of dyadic coping (EDC = 2 items). The scoring for DCI is done by summing up 35 items after reverse coding 8 items from NDC and excluding 2 items from EDC.

Data Analysis

The backward-translation was done by one translator with a bachelor's degree on English Literature. We compared the original version and backward-translation version using analysis suggested by Sperber (2004) to see linguistic aspects such as similarity and comparability from both versions.

Evidence for validity based on content were acquired using Polit and Beck (2007) theory on I-CVI and S-CVI. We also looked for evidence for validity based on response processes by conducting cognitive interview, and applied thematic analysis (Willis, 2014) to the results.

Finally, we determined the reliability of the DCI (Indonesian version) by looking at the instrument's internal consistency (Cronbach's Alpha) using Jamovi version 2.3.

Findings

The backward-translation process

Three raters were involved in the process of comparing the original version and the backward-translation version. All of them have education backgrounds in psychology and is fluent in both English and Indonesian languages. Through this step, we acquired results on the similarity and comparability aspects of the instrument. All items had mean

scores below 2,50 on both aspects, which considered acceptable (meaning that all of the items were of similar meaning despite having different sentence structures than the original version).

Evidence for validity based on content

We acquired evidence for validity based on content through expert judgement. Several raters were involved in this stage, they were selected based on their expertise on fields such as relationships, stress, and coping. Some of them are psychologists, postgraduate psychology students, and a lecturer. After calculating the I-CVI value & S-CVI value (Table 1) based on Polit's theory, and after reviewing the experts' feedback, we came up with the draft of the instrument.

Table 1. S-CVI value of the DCI – Indonesian version

Parameter			Conclusion
Relevancy	Importance	Clarity	
0,99	0,98	0,97	The instrument is valid and can be used as an assessment tool, with a minor revision according to I-CVI results

Evidence for validity based on response processes

The cognitive interviews were done before we conducted the pilot study. Several participants were involved and most of them understood the instructions and what each item of the instrument was meant to measure. We inferred this conclusion based on the result of thematic analysis (Willis, 2014). We found two themes related to dyadic coping, one was communication pattern (verbal or non-verbal) and the other one was coping strategies (how they cope can be linked back to the definitions of each form of dyadic coping).

Based on their comments about the response descriptions, we changed it from "very rarely to very often" into "never to always". Some of the participants said the former was rather ambiguous in the Indonesian language and that they were more familiar with the "never to always" type of Likert scale.

The participants also gave feedback on some of the items of the instrument. We took that into consideration and finally came up with the version to be used in pilot study.

Reliability (Cronbach's Alpha)

The coefficient of reliability in this study can be seen on Table 2. The result is consistent with previous findings from studies adapting the instrument. The DCI has an overall high internal consistency with value above .90 (α = .93). As for each of the dimensions, it has value ranging from .64 to .95.

Table 2. Coefficient of reliability for DCI

Dimension	Cronbach's Alpha
Stress communication (SC)	0.775
Supportive dyadic coping (SDC)	0.894
Delegated dyadic coping (DDC)	0.644
Common dyadic coping (CDC)	0.776
Negative dyadic coping (NDC)	0.753
Evaluation of dyadic coping (EDC)	0.951

Discussion

The examination on the equivalence of the instrument from a linguistic point of view was done using Sperber (2004) theory. The mean scores of each item are below 2,50, it showed that all items between the original version and the backward-translation version are equivalent in terms of similarity and comparability.

This study also provided evidence for validity based on content and response processes of the instrument. The result of the expert judgement is quite comprehensive, as it evaluated the items by using quantitative measures of the method suggested by Polit and Beck (2007), while also taking into account the qualitative aspects (written feedbacks on both the items and the overall scale). Findings acquired from cognitive interviews added yet another evidence for the instrument's validity. From feedbacks given by the participants and from thematic analysis done according to Willis (2014), we managed to improve the quality of the instrument before conducting tryouts.

The instrument showed a high internal consistency, and so are the dimensions as per the result of the pilot study (Table 2). One of the dimensions has coefficient bellow .70, but we did not remove it. Nepomuceno et al. (2022) stated that it is still acceptable though values between .60 to .70 are considered the lower acceptability limit.

Conclusion

Limitations

Since the findings mentioned in this article derived from a pilot study, we suggest further studies to include larger samples (±300) to conduct Confirmatory Factor Analysis/CFA as prove for validity based on internal structure of the instrument. Also, two of the items have inter-items coefficients below 0.30, so we suggest that perhaps some revisions can be made on these items before conducting the large-scale reliability and validity testing (field test).

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