

Maternal Attachment and Cognitive Distortion of Muslim Adolescents in Juvenile Rehabilitation Residential Schools: Self-Regulation as Mediating Mechanism

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The increase in disorderly behavior at the adolescent stage is a major dilemma for Malaysian society as the number of criminal cases committed by Muslim adolescents is increasing. These unwanted behaviors may be triggered by the quality of attachment relationships and errors in terms of the adolescent's cognitive interpretation. The aim of the current study is to explore the relationship between maternal attachment (secure and insecure) and cognitive distortion of Muslim adolescents in juvenile rehabilitation residential schools mediated by self-regulation. Data from 440 Muslim adolescents (aged between 14 and 18) were examined using the structural equation model (AMOS). The finding indicated a significant positive relationship between secure maternal attachment and self-regulation as well as a relationship between insecure maternal attachment and cognitive distortion, while a significant negative relationship was found between self-regulation and cognitive distortion. Moreover, the indirect effect indicated that only the relationship between secure maternal attachment and cognitive distortion was completely mediated by self-regulation. This study suggests that secure maternal attachment was associated with higher self-regulation which in turn lowers cognitive distortion among Muslim adolescents. The results may facilitate improvement of mother-adolescent relationships and reduction of cognitive distortion among Muslim adolescents with the guidance of their self-regulation.

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Introduction

Parental attachment plays a dominant responsibility on diverse aspects of children's growth (Mennen & O'Keefe, 2005; Schore & Schore, 2008) due to the process of parent-adolescent attachment that is established persistently over time (Allen, Porter, McFarland, McElhaney, & Marsh, 2007; Van der Vorst, Engels, Meeus, & Deković, 2006). This parent-adolescent attachment comprises a few patterns (i.e., secure, ambivalent, avoidant, and disordered attachment) that normally result from varying past experiences mainly in the earliest stage of human development.

From one Islamic-informed perspective, Siti Fatimah, Hayati, Hamidin, and Anita (2014) emphasized that the parent-child relationship should be viewed in context of responsibilities and rights. Correlative responsibilities and rights practiced by parents and children give a picture of secure attachment between parents and their children. For instance, children have a right to be loved, and that perspective considers the responsibility is on parents to show their love. By maintaining close attachment with children, parents are able to effectively nurture their children (Manap & Baba, 2016). Apart from that, parental attachment in Islamic literature is encouraged from birth. Secure maternal attachment is developed via breastfeeding as it offers psychological and affective benefits for both mother and child, which has been stated in verses of Qur'an, as below:

“Mother may nurse [breastfeed] their children two complete years for whoever wishes to complete the nursing [period].” (Qur'an 2:23)

In attachment theory, parent-child relationships and emotional bonds contribute to the development of mental representations of self and surroundings, which are known as internal working models (IWMs) or cognitive frameworks (Bretherton, 1985; Sroufe & Waters, 1977). The basic framework of the internal working model involves a comprehensive range of attachment-relevant experiences and mental schemas constructed from a combination of previous childhood memories (Pietromonaco & Barrett, 2000). Children and adolescents possess ways of processing information, reflecting internal expectations about their parents due to different attachment styles (Dykas & Cassidy, 2011). Indeed, negative attachment-relevant experiences were commonly related to insecure attachment and was found to affect adolescents' IWMs by inaccurately interpreting situations or information, known as cognitive distortion (Barrett & Holmes, 2001; Blaustein & Kinniburgh, 2018). In particular, insecurely attached adolescents were more likely to develop a negative view of self and others due to their biased interpretation via negative internal working models; securely attached adolescents perceived opposite view of self and others through healthy internal working models.

The quality of adolescents' attachment relationships with parents has been found to influence adolescents' overall development. A secure attachment relationship between adolescents and their parents will lead to better constructive sense of self and others, higher academic success and life satisfaction, better interpersonal functioning, and potentially lower possibility of delinquency as well as psychological distress (Jiang, Huebner, & Hills, 2013; Yaacob, Idris, &

Wan, 2015). However, children with poor attachment were considered to be at high risk of getting involved in delinquency, depression, and academic failure (Cicchetti & Manly, 2001; Lansford et al., 2002). Local research in Malaysia has shown that conduct problems in adolescents are directly related to weak family attachment (Kuthoos, Endut, Selamat, Hashim, & Azmawati, 2016; Siti Noor Fazarina, Razima, Azahar, & Norhamidah, 2016). Further, insecure attachment relationships causes communication as well as cognitive distortions among adolescents (Ingram, Overbey, & Fortier, 2001; Shumaker, Deutsch, & Brenninkmeyer, 2009; Whisman & Kwon, 1992).

Bowlby (1969, 1998) emphasized that the development of attachment between infant and their primary caregiver (commonly the mother) in early life continues to be an important family factor for the individual's whole life. Maternal attachment has been related to various outcomes especially for cognitive performance (Moss & St-Laurent, 2001). Maternal attachment was the main focus of the past research that explored family interactions and adolescents' cognitive development (Aviezer, Sagi, Resnick, & Gini, 2002; Granot & Mayseless, 2001; Moss & St-Laurent, 2001; O'Connor & McCartney, 2007; Shmueli-Goetz, Target, Fonagy, & Datta, 2008). Negative cognitive outcomes, however, are less often explored in research and literature (Allen et al., 2007, Shumaker et al., 2009). For this reason, researchers were encouraged to increase study on maternal attachment (secure and insecure) and adolescents' cognitive distortion.

Parental attachment has been well documented to indirectly affect adolescent developmental outcomes through internal resources such as self-regulation (McClelland & Cameron, 2011; Pintrich, 2004). Self-regulation is defined as capability in controlling emotions, behaviors, and cognitions meeting social norms and the physical context (Volling, McElwain, Notaro, & Herrera, 2002). Past studies highlighted the role of self-regulation as a vital protective factor in preventing adolescents from engaging with bias interpretation and risky behaviors (Moilanen, 2007).

According to statistics of the Royal Malaysian Police (Rahim, Zainudin, & Rajamanickam, 2015), the number of adolescents involved in crime is increasing. One prominent incident involved a group of Muslim adolescents who committed revenge arson at a Qur'an memorization school in Datuk Keramat, killing 23 people (*The Star*, 14th September 2017). This atrocity alarmed Malaysians regarding their safety and their youth's future. Several researchers have emphasized cognitive distortion as one potential internal factor of problem behavior among adolescents (Barriga, Landau, Stinson, Liau, & Gibbs, 2000; Wallinius, Johansson, Larden, & Dernevik, 2011). Lack of research on the role of mediating mechanisms in the relationship between maternal attachment and cognitive outcomes among adolescents (West, Mathews, & Kerns, 2013) inspired the current study to examine self-regulation since it is a potential protective element in preventing cognitive distortion and problem behaviors among adolescents (Moilanen, 2007). The current study aims to examine the relationship between maternal attachment (secure and insecure) and cognitive distortion of Muslim adolescents in juvenile rehabilitation residential schools, as well as evaluating the mediating effect of self-regulation.

Methodology

This research is a subset from the nationwide study led by Baharudin, Zulkefly, and Arshat (2015) that seeks to investigate the comprehensive mechanisms by which parental religiosity and attachment influences children's cognitive functioning as well as problem behavior. As in the nationwide study, the current research employed cross-sectional design in order to

examine the relationship between maternal attachment, self-regulation, and cognitive distortion among Muslim adolescents in juvenile rehabilitation residential schools. Data were collected via questionnaires in which all participants were required to recall and complete the item survey on their maternal attachment, self-regulation, and cognitive distortion before they were sentenced into the rehabilitation schools.

Participants

The population of the nationwide study comprises Muslim adolescents in juvenile rehabilitation residential schools, ages between 13 and 21 years old. The target sample of the current study is Muslim adolescents between 14 and 18 years old undergoing rehabilitation programs in all eight juvenile rehabilitation residential schools in Malaysia. A total of 440 Muslim adolescents were selected through stratified random sampling; the population was stratified according to their gender. The present sample includes 268 male (60.9%) and 172 female (39.1%) participants, most between 16 and 17 year old (52%; mean age = 16.71 years; Sd. = 1.14). Participants reported that their parents were in their forties (Father: Mean = 47.8, Sd. = 9.5; Mother: Mean = 43.04, Sd. = 7.6) and almost all of them (93.9%) came from a family with low socio-economic status or low parent monthly income (< USD 1052).

Measures

The domains of adolescents' attachment scale (DAAS). The Domains of Adolescent Attachment Scale-Malay (DAAS-Malay; 2013) was employed to measure attachment to the maternal caregiver in the adolescents' attachment network. Secure and insecure attachments are **two** subscales that represent maternal attachment. The DAAS-Malay is a self-report questionnaire that was answered by the respondents using a 5-point Likert scale ranging from 1 (not at all) to 5 (very much). Higher scores for respective subscale indicated higher levels of each maternal attachment subscale. The internal reliabilities of the secure and insecure maternal attachments of the study sample were 0.89 and 0.67, which were in the acceptable range for reliability (George & Mallery, 2003). Examples of items in the DAAS-Malay are:

- a) My mother pays attention to me.
(*Ibu saya memberi tumpuan kepada saya*)

- b) My mother is around to give me advice and help when I want it.
(*Ibu saya ada di sekitar memberi saya nasihat atau bantuan apabila saya mahukannya*)

Self-regulation Scale (SRS). The degree of adolescents' self-regulation covering emotional, behavioral, and cognitive aspects was measured using the Malay version of Self-Regulation Scales (SRS; Novak & Clayton, 2001). This 13-item questionnaire was designed with a 4-point Likert scale, ranging from 1 (never true) to 4 (always true). A total score was generated by summing up all the items, and higher scores reflected better self-regulation among the Malaysian Muslim adolescents. For the current study, Cronbach's alpha obtained was 0.79, which was in the satisfactory range for reliability (George & Mallery, 2003). Examples of items measured in the SRS are as follows:

- a) Little things throw me off when I am working/studying.
(*Perkara-perkara remeh buat saya terganggu semasa saya bekerja/belajar*)
- b) I develop a plan for all my important goals.
(*Saya bina perancangan untuk semua matlamat penting saya*)

How I Think (HIT) Questionnaire. The 16-item revised and Malay version of the How I Think Questionnaire (HIT; Ara & Shah, 2015) was used to measure the level of self-serving cognitive distortions among adolescents. A 6-point Likert scale ranging from strongly disagree to strongly agree was employed to rate the items. Higher sum scores revealed increased severity of cognitive distortion in Malaysian Muslim adolescents. The Cronbach's alpha value for this scale in the current study was 0.85 which was above the good minimum value of 0.80 for reliability (George & Mallery, 2003). Examples of items in the HIT-16 questionnaire are:

- a) It is ok to tell a lie if someone is dumb enough to fall for it.
(*Adalah OK untuk berbohong jika seseorang itu cukup bodoh untuk mempercayainya*)
- b) If someone is careless enough to lose a wallet, they deserve to have it stolen.
(*Jika seseorang itu cukup cuai sehingga kehilangan dompet, ianya berhak untuk dicuri*)

Procedure

Ethical clearance from the ethics committee of University Putra Malaysia (UPM) was obtained as the first step in the data collection process, followed by submission of the research proposal and questionnaires to the Department of Social Welfare for data collection permission. Next, all juvenile rehabilitation residential schools in Malaysia were informed about the list of Muslim juvenile residents and written consent. A pilot test was first conducted among randomly selected Muslim respondents in the rehabilitation schools who were later excluded from the actual study. Then, the questionnaires went through several modifications, such as item deletion and restructured of items, and were distributed to all Muslim respondents in the actual study. During the actual data collection, respondents were split into smaller groups and they completed the questionnaire in roughly 30 minutes, with a 100% return rate.

Data analyses

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 21.0 and Analysis of Moment Structure (AMOS) 20.0. Preliminary analyses were applied in order to examine the descriptive statistics and correlations among variables of interest. For multivariate analysis, structural equation modeling (SEM) with the maximum likelihood method was utilized. The model goodness of fit was tested using several fit indices (Kline, 2005). The recommended indices to estimate goodness of fit in the path analyses are the normed chi-square (χ^2/df) < 5, the Root Mean Square Error of Approximation (RMSEA) < 0.05, Goodness of Fit Indices (GFI) > 0.90, and Comparative Fit Index (CFI) > 0.90 (Kline, 2005). A full structural model encompassing parceled variables of secure and insecure maternal attachment subscales, self-regulation, and cognitive distortion was assessed. Mediation analysis consuming bootstrapping estimation procedure (Preacher & Hayes, 2008) was applied to examine the mediating effect of adolescent self-regulation through which maternal attachment (secure and insecure) was linked with cognitive distortion.

Results

Preliminary analyses

The results of the descriptive and correlational analysis for all variables of interest are presented in Table 1. Significant correlations were observed for both secure and insecure maternal attachment with self-regulation and with cognitive distortion. Secure maternal attachment and self-regulation were negatively related with cognitive distortion (secure: $r = -.11$, $p < .05$; self-regulation: $r = -.33$, $p < .01$). Insecure maternal attachment was also found to be negatively correlated with self-regulation ($r = -.23$, $p < .01$). There was a significantly positive relationship between insecure maternal attachment and cognitive distortion ($r = .10$, $p < .05$) and a significant positive relationship between secure maternal attachment and self-regulation ($r = .22$, $p < .01$). In general, both independent variables (secure and insecure maternal attachment) were significantly associated with self-regulation and cognitive distortion, in which the directions of associations were as predicted with acceptable magnitude ranged from 0.10 to 0.33. These results also suggest that Malaysian Muslim juvenile offenders with poor maternal attachment and lower level of self-regulation were more likely to have higher degree of cognitive distortion.

Structural equation modelling

The first step in conducting structural equation modeling (SEM) to examine the structural relations among the study variables is through the validation of respective measurement model of all latent variables. The results of Confirmatory Factor Analysis (CFA) suggested that all measurement model fit indices reflected satisfactory model fit. Next, parceling technique was applied as some of the study variables possessed large number of items and structural equation modeling was found to be more convenient if indicators were lesser (Little, Cunningham, Shahar, & Widaman, 2002).

The random assignment technique was utilized to parcel the latent variables into a few indicators. Particularly, items were randomly selected to form the parcels in each construct. All in all, the fit indices of the parceled model of secure maternal attachment ($\chi^2 = 2.63$; $df = 2$; $\chi^2/df = 1.32$; RMSEA = .03; CFI = .99; GFI = .99), insecure maternal attachment ($\chi^2 = 4.50$; $df = 2$; $\chi^2/df = 2.25$; RMSEA = .05; CFI = .99; GFI = .99), self-regulation ($\chi^2 = 4.58$; $df = 2$; $\chi^2/df = 2.29$; RMSEA = .05; CFI = .99; GFI = .99), and cognitive distortion ($\chi^2 = 2.88$; $df = 2$; $\chi^2/df = 1.44$; RMSEA = .03; CFI = .99; GFI = .99) proposed sufficient in overall goodness of fit statistics. Finally, the full structural model (as illustrated in Figure 1) was evaluated based on the recommended goodness-of-fit.

According to the goodness-of-fit indices, the initial structural model was found to fit well to the data ($\chi^2 = 183.12$; $df = 98$; $\chi^2/df = 1.87$; $p < 0.001$; RMSEA = 0.05; CFI = 0.96; GFI = 0.94). Even supposing that the structural model fitted the data well, a potential better-fit statistics for the data could be achieved by examining the modification indices. Therefore, error term 1 and 5 of maternal attachment was suggested to be correlated due to the possibility of the similar item content or wording in each parcel. Consequently, the goodness-of-fit indices revealed an improvement with $\chi^2 = 164.46$; $df = 97$; $\chi^2/df = 1.70$; $p < 0.001$; RMSEA = 0.04; CFI = 0.97; GFI = 0.95, confirming an excellent model fit to the data. Hence, a final (revised) structural model as depicted by Figure 1 was attained. Besides, squared multiple correlation coefficient exposed that the final (revised) model accounted 24% of the variance in cognitive distortion and 2% of the variance for self-regulation.

Significant correlations were revealed through the examination of the final (revised) model. Independent variables of insecure maternal attachment ($B = .12, p = 0.040$) and self-regulation ($B = -.45, p = .001$) were indicated to possess direct and small influence on cognitive distortion. However, the path between secure maternal attachment and cognitive distortion was found to be insignificant. On the other hand, secure maternal attachment had a small ($B = .15, p = 0.030$) influence on self-regulation, while insecure maternal attachment was reported to possess insignificant relationship with self-regulation.

Mediation test of self-regulation

Bootstrapping method was applied for mediation analysis to investigate the significance of self-regulation as a mediating effect in the final structural model. Indirect effect can be claimed as significant when zero is not in the lower and upper limit of the 95% confidence intervals (Preacher & Hayes, 2008). The result of bias-corrected confident interval bootstrapping of the indirect model is presented in Table 2. However, only indirect effect of secure maternal attachment on cognitive distortion via self-regulation ($SIE = -.07, SE = .04, p < 0.05$, bootstrap 95% CI = $-.15$ to $-.01$) was statistically different from zero, which suggested that there was a significant mediating effect via self-regulation. All in all, the findings of mediation analysis revealed that secure maternal attachment with the mediating effect of self-regulation were considered as significant factors that influenced cognitive distortion among Malaysian Muslim juvenile offenders. Moreover, the findings of this study highlighted the roles of secure maternal attachment and self-regulation in controlling cognitive distortion among the institutionalized study population.

Discussion

The results of the current study revealed a significant negative relationship between insecure maternal attachment and cognitive distortion, and is consistent with past studies (Dykas & Cassidy, 2011; Mason, Platts, & Tyson, 2005). This finding indicates insecure maternal attachment resulted in a greater degree of cognitive distortion among Malaysian Muslim juvenile offenders. In other words, the level of cognitive distortion among Malaysian Muslim juvenile offenders was determined by the quality of mother-adolescents attachment. Attachment relationships built from early childhood created internal working model that comprised positive and negative attachment-relevant memories or mental schemas (Pietromonaco & Barrett, 2000; Thompson, 2008). Insecure attachment relationships with mothers contribute to negative internal working models or weak attachment schemas which may lead to a negative perception of self, others, and the world (Bowlby, 1963). Weak attachment schemas may strengthen the Malaysian Muslim juvenile offenders' negative schemas, which study results reflect in their distorted perception and later demonstrated through their misbehavior (Amani, Majzoobi, & Azadi Fard, 2017).

In contrast, secure maternal attachment was significantly positively related to self-regulation among research participants. The finding is consistent with earlier studies (Calkins & Leerkes, 2004; Meriac, Slifka, & LaBat, 2015) emphasizing that better self-regulation may be explained by a strong mother-adolescent attachment. The current finding supports the opinion by Kopp (1982) regarding attachment and self-regulation. Self-regulation in adolescents was found to begin formation in attachment with their caregivers during childhood and also known as a developmental capacity that was formed via interactions with caregivers (Calkins & Leerkes, 2004). For that reason, the feeling of security from mothers as a secure base among study participants was found to be essential in the development of better

self-regulation in them. In other words, securely attached Malaysian Muslim juvenile offenders were able to develop advanced self-regulatory capacities due to availability and emotional support from their caregivers during distressing situations (Karreman, Van Tuijl, van Aken, & Deković, 2006).

Findings from the current study reveal that self-regulation was significantly inversely related to cognitive distortion among Malaysian Muslim juvenile offenders. Results from the current study extend prior literature (Volling et al., 2002; Muraven & Baumeister, 2000) by suggesting that the presence of good self-regulation could lead to lesser degree of cognitive distortion as self-regulation acts as a controller of emotion, cognition, and behaviors. Other findings support self-regulation being related to cognitive outcomes. Van der Merwe and Dawes (2000) described children involved in the violence being stimulated by the failure in controlling negative cognitions and possessing self-regulatory inconsistencies. Raffaelli and colleagues (2005) suggested that risks related to cognitive and behavior problems can be reduced if the adolescents are capable to control their behavior, attention, and emotion. Thus, self-regulation is important as a protective factor against cognitive-based psychopathology and problem behaviors (Gestsdottir & Lerner, 2008).

Although the study has achieved its aims, there were some unavoidable limitations. Results of the current study were based on self-reports provided by respondents about their past experiences with their mothers, which can be assumed to possess potential biases. With this in mind, future investigation should refer to the information collected from multiple informants. Both caregivers and adolescents can be recruited and the information may be more accurate as compared to single informant.

Conclusion

The aim of the current study was to examine the relationship between maternal attachment (secure and insecure) and cognitive distortion as well as the mediating effect of self-regulation among a sample of Muslim juvenile offenders in rehabilitation residential schools in Malaysia. In general, the findings of the current study proposed a direct relationship between insecure maternal attachment and the development of cognitive distortion among participants. The current finding supports Bowlby Attachment Theory (1969, 1982), which highlighted the vital role of attachment between mothers and their children in controlling biased cognitive process; weak maternal attachment is associated with higher tendencies for cognitive distortion.

Moreover, this study found that secure maternal attachment is completely and indirectly related to the sample's cognitive distortion via self-regulation. The finding of the current research supported the mediating role self-regulation as an internal resource on the formation of cognitive distortion among adolescents. With this in mind, it may be concluded that the better self-regulation can be developed through secure maternal attachment, and lessens the possibility of cognitive distortion. Findings from the current study provide a better framework and knowledge for different sectors (e.g., parents, caregivers, probation officers and personnel of juvenile rehabilitation residential schools) to consider new ways of designing effective prevention and intervention programs related to the cognitive distortion in light of their attachment needs. With the intention of overcoming the high level of cognitive distortion among study participants, military-style residential treatment programs are considered as among the most beneficial alternatives as they provide well-trained discipline, monitoring, structure, goal-directed activities, and an alternate educational environment (McMahon & Wells, 1998) for those who are struggling in their home and school settings. Undeniably, more

constructive experiences were reported by adolescents who joined the programs as compared to those in traditional facilities (Styve, MacKenzie, Gover, & Mitchell, 2000; Weis, Crockett, & Vieth, 2004). Moreover, these treatment programs were found to be a potential helping factor for study participants to attain better self-regulation, which acts as a crucial mechanism in controlling the development of cognitive distortion. In summary, findings of the present study offer helpful information for policymakers as they strategize preventive programs and treatments to address poor parental attachment, self-regulation, and cognitive distortion among juvenile offenders.

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