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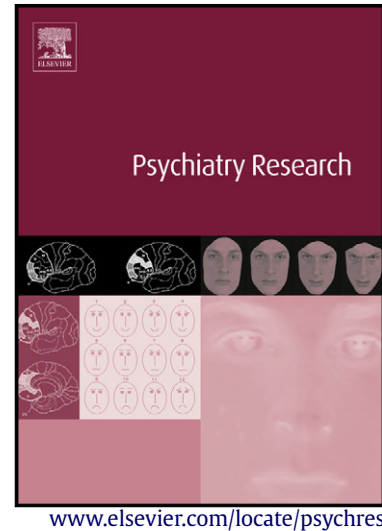
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Caretaker mental health and family environment factors are associated with adolescent psychiatric problems in a Vietnamese sample

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Abstract

Little is known about risk factors for adolescent mental health in Vietnam. The present study investigated the relationship between caretaker mental health and adolescent mental health in a cross-sectional Vietnamese sample. Primary caretakers completed measures of their own mental distress and general health status using the Self-Reporting Questionnaire-20 (SRQ-20) as well as reports of adolescent mental health using the parent version of the Strengths and Difficulties Questionnaire (SDQ). Multivariate regression models were used to examine the relationships between the caretaker and adolescent health variables. The demographic factors of age, sex, ethnicity, religious affiliation, and household wealth status demonstrated significant relationships with SDQ subscale scores. Caretaker mental health was positively associated with adolescent mental health, and this association remained significant even after accounting for other relevant demographic variables and caretaker general health status. Understanding correlates of adolescent mental health difficulties may help identify youth and families at risk for developing psychiatric problems and inform mental health interventions in Vietnam.

Keywords: Psychopathology; Vietnam; Public Health; Epidemiology

1. Introduction

Psychiatric disorders in children and adolescents produce significant social and economic consequences for the individual, their immediate families, and the global community (Demyttenaere et al., 2004; Kessler et al., 2007). Although children and adolescents account for an estimated 20% of mental health cases globally, obtaining prevalence rates in low-income countries has proven difficult due to lack of services available and insufficient data gathering systems (World Health Organization, 2005). Recognizing this gap, increased effort has been placed on examining the impact of child and adolescent mental health issues and identifying potential risk factors associated with the development and maintenance of psychiatric disorders in youth.

Existing literature on youth in low-income countries has suggested a number of factors that may be related to mental health risk. Similar to high-income countries, low socioeconomic level, limited access to education, poor physical health, traumatic childhood experiences, and family disruption have been identified frequently as putative risk factors for youth mental health disorders in low-income countries (Fuhr and De Silva, 2008; Patel et al., 2008; Graham and Jordan, 2011). Sex has also been shown to have important implications for mental health; cross-cultural study of internalizing and externalizing symptoms among youth suggests that boys tend to have more externalizing problems but lower internalizing symptoms than girls (Crijnen et al., 1997), a finding that is largely consistent with Western samples (e.g., Angold and Rutter, 1992; Lewinsohn et al., 1993).

Despite the identification of risk factors implicated in mental health problems that are shared by high- and low-income youth samples, youth mental health in low-income

countries may be uniquely influenced by other important factors. Demographic variables such as ethnicity, family wealth status, and religious affiliation have not been well studied among youth in low-income countries, there is some evidence that these factors may have significant effects on the family environment and, in turn, youth mental health. In contrast to findings from the United States, in which minority ethnicity and lower household wealth status have been found to confer risk for youth mental illness (e.g., Garrison et al., 1989; Schraedley et al., 1999; Wight et al., 2005), previous work in Vietnam did not find any interaction between family wealth status and child physical and mental health status (Fuhr and De Silva, 2008). This finding suggests that further work is needed to clarify the relationship between these factors in other cultures and contexts. With regard to religious affiliation, most studies of religion and mental health in developing nations have focused on adult samples, and suggest that religious beliefs may reduce risk of mental illness (Sipsma et al., 2013), likely through increasing positive coping and social support (Steglitz et al., 2012). However, very little attention has been given to this topic among youth. One study of mental health among urban-dwelling Brazilian adolescents suggested that having a greater commitment to religious practices was associated with fewer psychiatric symptoms (Cucchiaro and Dalgalarondo, 2007). By comparison, findings among Western minority ethnicity and low-income adolescent samples are mixed, with some studies supporting religion as a protective factor against adolescent substance abuse (Kulis et al., 2012), and others finding no relationship between religious involvement and substance use (Parsai et al., 2010). Religion and socioeconomic status are particularly interesting targets for future work on youth mental health because these factors may indicate the influence of more general familial factors,

since religion and wealth status represent broader aspects of the environment in which children are raised.

Within the extant literature, it is unclear the degree to which various familial and environmental factors impact youth psychiatric problems in low-income countries. Much of the work conducted in this area has focused on family disruption, including studies of authoritarian parenting style and parental violence (Evans et al., 2005; Goodman et al., 2007), or familial separation (Graham and Jordan, 2011), and less is known regarding the possible impact of the parents' general mental health status on their children's psychiatric outcomes. Parental history of mental illness has been linked with increased risk of psychiatric disorders in their children (Dean et al., 2010). Although this relationship is present in both high and low-income areas (Kessler et al., 2010), hardships and stress associated with economic difficulties and other environmental factors may compound psychiatric symptoms experienced in low-income countries. The unique obstacles and barriers associated with gaining access to mental health care in low-income countries, such as lack of education and/or outreach, differences in stigma across cultures, and limited numbers of specialized mental health providers, may contribute to increased rates of mental illness (Belfer, 2008). Low and lower-middle income countries often have significant gaps in mental health diagnosis reporting, fewer mental health workers, and a lower median percentage of health expenditures dedicated to mental health. Further, many of these countries lack community mental health care, and most mental health treatments, including psychotropic medications and psychosocial interventions, are widely unavailable in primary care clinics (Nguyen et al., 2005; Saraceno et al., 2007; Niemi et al., 2010).

Research on parent-child mental health in low-income nations has suggested an intergenerational effect for psychiatric difficulties, although this association may be mediated, in part, by additional environmental factors. For example, Reed and colleagues' (2011) review of data on forcibly displaced children and adolescents in low- and middle-income countries revealed a relationship between parental mental and physical health and the future psychiatric symptoms in their offspring. Specifically, the study noted a contribution of several factors including poverty, malnutrition, loss of social support, and family violence as stressors conferring risk for psychopathology in children (Reed et al., 2011). In another study conducted in Afghanistan, a school-based survey addressing caretaker-child associations demonstrated a stronger likelihood of ratings of child mental health problems from multiple informants as parental psychiatric symptoms increased (Panter-Brick et al., 2009). Additionally, investigation of child mental health in the context of parental migration identified that caretaker mental health status was a consistently important predictor of emotional and conduct disorders among children in four Southeast Asian countries, which included Indonesia, the Philippines, Thailand, and Vietnam (Graham and Jordan, 2011). While these studies support the relationship between youth psychiatric problems and highly stressful life experiences, including displacement, violence, and living in a combat zone, the findings also highlight the impact of caretaker health and household dynamics on youth mental health. More work is needed to better understand the association between parent and child mental health in low-income countries and within specific cultural contexts, and to examine how this association may relate with other identified risk factors.

Cross-cultural research on the parent-child mental health relationship is particularly limited with regard to Southeast Asian samples. The World Health Organization (WHO) has begun to collect data on youth mental health in countries such as Thailand, Sri Lanka, and India, but a lack of information on child and adolescent mental health persists in Vietnam (WHO, 2005). A few studies have begun to fill this gap; for example, previous work with the present sample used the 25-item Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) to determine prevalence estimates of mental health problems in Vietnamese adolescents, and identified a probable “caseness” of 9.1% (Amstadter et al., 2011). In this sample, “caseness” of probable mental health problems was defined by the SDQ cut-off score of 14, which included scores in the borderline range (scores of 14-16) and abnormal range (scores of 17-40) on the total difficulties score. Other reports on youth and caretaker health identified much higher rates of child psychiatric problems in Vietnam, and found that an estimated 20% of the sample had SDQ scores in the abnormal range, and an additional 18% of the sample scored in the borderline range (Tuan et al., 2003; Fuhr and De Silva, 2008). Further, 20% of caretakers reported depression symptoms, suggesting the potential for parent mental health to have a significant impact on the overall family environment (Tuan et al., 2003). Graham and Jordan (2011) employed an alternate SDQ scoring model in their sample of Southeast Asian children, and used only the SDQ subscale scores of “Emotional Symptoms” and “Conduct Problems” as predictors for cases of mental disorders. In their Vietnamese sample of children under the age of 12, the prevalence of abnormal scores, defined as scores >4 for Emotional Symptoms and >3 for Conduct Problems, yielded rates of 24% and 9%, respectively. While the rate of SDQ caseness in the present sample

is low in comparison to other studies of youth mental health in Vietnam, it is consistent with work conducted by Steel and colleagues (2009) in adult samples in Vietnam, which estimated mental distress rates of 2-9%. Mental health symptom reporting in youth and adult samples may vary as the result of many contextual factors, and exploration of these factors represents a target of the current study.

Given the high psychiatric prevalence estimates and the paucity of research in this area, there is a need to better understand potential risk factors for children and adolescents in low-income countries, and how specific familial or demographic factors (i.e., age, sex, wealth status, religion, ethnicity) may influence the development of psychopathology. By identifying correlates of psychiatric problems reported within families, screening and interventions may more effectively target households at risk for psychopathology and other functional difficulties. The present study aims to fill the gap in knowledge regarding caretaker mental health status and youth psychiatric problems by examining the associations between caretaker mental health, caretaker general health status, and youth mental health in a cross-sectional Vietnamese sample of adolescents and their caretakers.

The present study is unique in that caretakers provide self-reports of their own mental and physical health status as well as reports of adolescents' symptoms. Although caretaker reports of youth mental health are frequently used in the literature, caretaker psychiatric symptoms are often an unmeasured variable that may function as a confounding factor in studies of youth mental health (e.g., Goodman et al., 2000a; Goodman et al., 2000b; Koskelainen et al., 2000; Becker et al., 2004). The current study conceptualizes the caretaker self-report of their own possible psychopathology as an

index of possible genetic (i.e., inherited risk) and environmental risk (e.g., environmental influences of a depressed caregiver, learned coping mechanisms) influences on youth mental health. In light of previous reports of psychiatric risk factors among adolescents in low-income countries, we hypothesized that adolescent mental health, as measured by the SDQ, will be associated with caretaker psychiatric complaints, as measured by the Self Reporting Questionnaire-20 Item (SRQ-20; WHO, 1994), and poor caretaker general health status.

2. Method

2.1. Data collection and sample

In August 2006, the Da Nang Department of Health and the Khanh Hoa Health Service, in cooperation with several NGOs (i.e., the Research and Training Centre for Community Development, the Vietnam Veterans of America Foundation, and the Atlantic Philanthropies) conducted a mental health needs assessment of residents in their respective provinces. This epidemiological study sought to obtain prevalence data regarding general mental health problems and associated mental health service needs of individuals in 1914 households in the Da Nang and Khanh Hoa provinces of Vietnam. The provinces are located on the central coast of Vietnam and represent both metropolitan and rural communities. Information collected included demographic characteristics, adult physical and mental health status, and adolescent mental health. A full description of the data collection methods has been previously described (Amstadter et al., 2009; Richardson et al., 2010).

Only data from families with adolescents (aged 11–18 years) are reported in the present analyses. A designated household reporter, generally the female head of household, was asked to provide health information on all members of the household. The sample was selected through a four stage cluster sampling strategy. First, 30 communes were randomly selected from each province. Second, at each selected commune three hamlets were randomly selected. Third, at each chosen hamlet 30 households were randomly selected, and finally, all household members aged 11 years and older were included in the study. The final sample included data on 1300 adolescents provided by their parent (typically their mother) or primary caretaker, who also completed interview questions about their own mental health. Of those who were randomly selected, 99.5% participated in the study.

Vietnamese lay interviewers from Da Nang and Khanh Hoa received six days of training, which included information regarding the purpose of the study, the research design, and the specific questionnaires, an interview training protocol, and education on depression, anxiety, alcohol abuse, sleep problems, chronic fatigue, and somatic symptoms (Richardson et al., 2010). All research practices were conducted under the approval of the Vietnamese government and the Da Nang Department of Health.

2.2. Study instruments and variables

This study represents one component of a larger multi-component needs assessments survey. Participants engaged in a structured interview that, in addition to collecting SRQ-20 and SDQ data, assessed general caretaker health status and demographic information.

2.2.1. Demographics

Demographics included age, sex, ethnic group, religious affiliation, and interviewer-assessed wealth. Sex was coded dichotomously as male or female. Ethnic group was defined as Kinh (the majority ethnicity in Vietnam), Rac Lay (one of 53 minority ethnic groups), or “Other” self-identified ethnic group. Religious affiliation was measured categorically by participants’ indication that they either practiced Buddhism, Christianity, or some other religion; or whether they endorsed not practicing any religion. Wealth status of the household was measured by two unique sources. First, the interviewer rated the family’s global socioeconomic status on a 5-point Likert scale, which included poorest, poor, average, better-off, and rich. Ratings were based on interviewer assessment of housing quality, consumer durables, and basic amenities (e.g., source of drinking water, household construction materials, toilet facilities, household appliances). Second, the household reporter was asked whether the household is considered a poor household by the community authority (yes or no). These measures are consistent with previous research examining indicators of wealth in developing nations (Cucchiaro and Dalgarrondo, 2007; Fuhr and De Silva, 2008; Acierno et al., 2009; Amstadter et al., 2009).

2.2.2. Caretaker health status

Item #1 of the World Health Organization, Short Form 36 (SF-36; Ware et al., 1993) was administered to assess the household reporter’s health status in this sample. Participants were asked to rate the following question, “In general, would you say your health is “Excellent, Very good, Good, Fair, or Poor?” These responses were

dichotomized into Poor Health (self-rating of fair or poor) and Good Health (self-rating of excellent, very good, or good) consistent with previous research (Ruggiero et al., 2009).

2.2.3. Self-Reporting Questionnaire-20 Item (SRQ-20)

The SRQ-20 (WHO, 1994) is a self-report measure of mental health that can be administered via interview or via paper/pencil questionnaire. Items are marked dichotomously (yes = 1, no = 0) over a 30-day recall period to obtain a maximum score of 20. Individual items are constructed to tap general aspects of non-psychotic mental distress, and are intended to be representative of several mental health constructs. For the purposes of this study, we used SRQ-20 total score as a continuous variable, rather than using the dichotomized “case” or “non-case” distinction that is commonly reported in a range of studies using this instrument. This methodology has been used similarly in previous work examining caretaker-child mental health (Panter-Brick et al., 2009), and it is consistent with the single-factor latent structure of the SRQ-20 in this dataset (Stratton et al., 2013). The SRQ-20 has been found to be reliable and valid in Vietnamese studies (Tuan et al., 2004; Giang et al., 2006), and high internal reliability was found in the present sample ($\alpha = .84$).

2.2.4. Strengths and Difficulties Questionnaire (SDQ)

The SDQ (Goodman, 1997) is a standardized measure of youth mental health problems and has been adapted for use in Vietnam with specific forms for parents, teachers, or youth to complete (Tuan et al., 2003). The parent rating form was used in the

present study. Of the 25 scale items, 14 describe perceived difficulties, 10 describe perceived strengths, and one is neutral (“gets on better with adults than with other children”). Each “perceived difficulties” item is scored on a 0–2 scale (“not true,” “somewhat true,” and “certainly true”). The SDQ items are divided into hyperactivity/inattention, emotional symptoms, conduct problems, peer relationship problems, and prosocial behavior (five items per score). All scores, with the exception of the prosocial behavior score, are summed to compose the total difficulties score. Scores in the 0-13 range are considered normal, scores 14-16 are considered borderline, and scores above 17 are considered abnormal. This measure has well established psychometric properties (Goodman, 1997) and has demonstrated utility and validity in identifying child mental health problems with numerous populations around the world, including a number of Western countries (Goodman et al., 2000a; Goodman et al., 2000b; Klasen et al., 2000; Koskelainen et al., 2000; Mathai et al., 2004; Shojaei et al., 2009), as well as Bangladesh (Goodman et al., 2000b; Mullick and Goodman, 2001), Brazil (Goodman et al., 2007), the Gaza Strip (Thabet et al., 2000), and Pakistan (Samad et al., 2005). The total difficulty score demonstrated good internal reliability in the sample ($\alpha = .73$). Internal reliability for the SDQ subscales varied from good to very low reliability: emotional symptoms ($\alpha = .70$), conduct problems ($\alpha = .53$), hyperactivity/inattention ($\alpha = .47$), peer relationship problems ($\alpha = .26$), and prosocial behavior ($\alpha = .61$). The range of internal reliability estimates is broadly consistent with previous work on the scale (e.g., Colins et al., 2013), and the particularly low internal reliability for the conduct problems and peer relationship problems is consistent with youth samples in Japan (Moriwaki and Kamio, 2014), China (Mellor et al., 2011), and multicultural samples in the Netherlands

(Colins et al., 2013; Mieloo et al., 2014). Past work suggests that differences in cultural reports of youth behavior may influence caretaker reports, particular in cross-cultural or minority group samples (Mieloo et al., 2014), thereby influencing reliability estimates. Notably, the SDQ subscales may be better conceptualized as symptom indexes rather than a set of unified items representing a single latent construct (e.g., depression), and thus internal reliability estimates may be less important for interpretation (Streiner, 2003). However, considering the potential concerns regarding cross-cultural reporting of behaviors, results regarding the SDQ subscales should be interpreted cautiously.

2.3. Data analysis plan

Analyses were conducted in SAS 9.2 (SAS Institute, Inc., 2009). Data were clustered by household, and linear regressions were run using PROC GENMOD procedure to account for the correlations among observations within household. *Z*-statistics and their corresponding *P*-values are reported. We first conducted bivariate analyses to explore the relationship between each potentially predictive variable and each outcome variable of interest. A total of 48 bivariate analyses were run; to survive a conservative Bonferroni correction for multiple tests, variables would need to surpass a *P*-value cutoff of < 0.001 . Predictive variables with $P < 0.10$ were included in the multivariate analyses.

3. Results

3.1. Descriptive statistics

SDQ data were available for $N = 1300$ adolescents from $N = 883$ households. The number of adolescents per household ranged from one to four, and the adolescents ranged

from 11-18 years of age, with a mean (standard deviation [SD]) age of 14.01 (1.96). The sample was 50% ($n = 650$) male. The overwhelming majority of the available sample (92.6%, $n = 1200$) reported being of Kinh ethnicity, 5.3% ($n = 69$) were of Rac Lay ethnicity, and 2.1% ($n = 27$) identified as another ethnicity. Most of the sample (71.2%, $n = 926$) reported no religious affiliation, 17.1% ($n = 222$) were Buddhist, 9.5% ($n = 124$) identified as Christian, and the remainder of the sample (2.2%, $n = 28$) reported some other religious affiliation. Most of the caretakers (70.3%, $n = 914$) reported overall good health. The mean (standard error [SE]) caretaker SRQ-20 total score was 4.41 (0.12), and ranged from 0-17. Adolescent scores on the SDQ are summarized in Table 1.

3.2. Bivariate analyses

We first conducted bivariate analyses to explore the associations between demographic characteristics, general caretaker health, and caretaker mental health with adolescent SDQ outcomes. Results are presented in Table 2. Sex was associated with several of the SDQ subscales, in which females exhibited more emotional problems and more prosocial behaviors than males, and males showed more hyperactivity relative to females. Religious affiliation showed an inverse relationship with caretaker-reported emotional problems, with an additional statistically significant relationship between “Other” religion and fewer peer problems. Age, ethnicity, interviewer-assessed wealth, caretaker general health, and caretaker mental health demonstrated several statistically significant associations with SDQ scores (Table 2). In some cases, the direction of effect for a particular predictor variable differed across subscales; for example, emotional symptoms had a positive association with both age and wealth status, while hyperactivity

scores showed an inverse relationship with age and wealth. Caretaker SRQ-20 total score was significantly associated with every SDQ outcome except prosocial behavior. As a whole, the results indicate a relationship between greater caretaker mental health symptoms and greater reports of adolescent difficulties.

3.3. Multivariate analyses

All variables with $P < 0.10$ from the bivariate analyses were included in multivariate analyses to investigate the potential unique variance accounted for by each variable. The results of these analyses are presented in Table 3. Sex remained significant in the subsequent analyses. The effects of age were similar across both the bivariate and multivariate analyses. Ethnicity and religious affiliation largely remained significant in relation to the SDQ subscale scores for emotional symptoms; ethnicity demonstrated additional associations with the hyperactivity/inattention, peer relationship problems, and prosocial behavior subscales. Notably, the significance of caretaker general health was diminished in three out of four cases, retaining statistical significance only in relation to the SDQ hyperactivity/inattention score. However, caretaker mental health remained significantly associated with every outcome with which it was associated in bivariate analyses. In each case, higher SRQ-20 scores were associated with poorer adolescent mental health ratings. These associations remained significant even after accounting for other relevant demographic variables and caretaker general health status.

4. Discussion

The purpose of this study was to investigate the relationship between caretaker mental health and reported adolescent psychiatric problems in a large epidemiological Vietnamese sample. Little is known regarding adolescent mental health concerns in Vietnam, and this is the first study, to our knowledge, to investigate the association between caretaker and youth mental health in this population. While the cross-sectional design of this study limits predictive conclusions regarding adolescent mental health, the results offer an important examination of the interplay between psychiatric and general health factors among the adolescents and their caretakers. As such, the results represent a valuable first step toward furthering the understanding of intergenerational psychiatric concerns within Vietnamese families. Our findings support the relationship between caretaker and adolescent mental health found in other studies of low-income countries (e.g., Panter-Brick et al., 2009; Reed et al., 2011) and in US studies (e.g., Weissman et al., 1987; Kendler et al., 1997; Bagnier et al., 2013). Moreover, our data suggest that caretaker mental health has a more pronounced relationship with adolescent psychiatric problems in this sample than other correlates, including caretaker health status, wealth status, and demographic factors.

Results from the present study revealed interesting patterns of caretaker-reported emotional and behavioral concerns among the adolescents in our survey. Females demonstrated more emotional problems than males, and males showed more hyperactivity relative to females; this pattern mirrors findings from United States and other cross-cultural samples in which females tend to experience more internalizing symptoms and males have higher rates of externalizing symptoms (Angold and Rutter,

1992; Lewinsohn et al, 1993; Crijnen et al., 1997). Females were also identified as demonstrating more prosocial behaviors than males. While it is difficult to determine the exact nature of this association, one possible explanation may be related to the prevalence of more traditional gender roles and expectations in Vietnam, in which girls and women are more likely to be described in terms of their relational roles (World Bank, 2011). Further, there were effects for age, in which emotional problems and prosocial behavior increased with age, while conduct problems and hyperactivity scores decreased with age, suggesting a possible maturation effect for some types of externalizing problems. Alternatively, as the adolescents age, it may be that caretaker reports of conduct problems become less accurate due to lower parental monitoring or the youth spending more time outside of the family home.

A strength of this study was the investigation of religious affiliation and ethnicity as potential risk factors for youth mental health; these variables have not been well studied among youth, particularly in low-income countries. Self-identified religious affiliation of Christian or “Other” religion was associated with fewer emotional symptoms, lending further support to the theory that religious beliefs and involvement may serve a protective function for mental health among youth (e.g., Cucchiaro and Dalgarrondo, 2007). Minority ethnicity status (i.e., Rac Lay, “Other”) was associated with more caretaker-reported emotional, hyperactivity/inattention, and peer relationship problems. Interestingly, this relationship remained despite wealth status no longer conferring additional risk for youth mental health problems in the multivariate analyses. The results suggest that minority ethnicity may function as a unique risk factor for psychiatric distress that is separate from wealth status. Ethnicity and family wealth level

are often confounded in analyses of socioeconomic status, yet these variables may represent discrete, independent risk factors; similar findings have been discussed in United States samples (Wight et al., 2005). It is important to note that only 7.4% of our sample identified as a member of a minority ethnicity group, which may indicate a particularly robust effect of stress associated with being a member of a minority cultural group in Vietnam. Further study with a more representative cultural sample is needed to fully explore the relationship between ethnicity group status and mental health.

While low socioeconomic level and/or poverty has been linked to poor youth mental health outcomes in previous work (Patel et al., 2008; Reed et al., 2011), results from the present study suggest that this relationship is diminished when considering other demographic factors and caretaker health. This finding is consistent with Panter-Brick and colleagues' (2009) study in Afghanistan, in which poverty predicted adult but not child mental health. Poverty may have less of a direct impact on child mental health relative to the overall household dynamics and caretaker psychopathology, or else the effect of poverty on child mental health is accounted for via the relationship of socioeconomic level to caretaker mental health; more work is needed to elucidate these associations. The results of the current study are also broadly consistent with the work of Graham and Jordan (2011), in which wealth was not generally associated with conduct problems for the children in the Southeast Asian samples. However, Graham and Jordan found an increase in emotional symptoms among Vietnamese children from wealthier households, which the authors explain as a possible reflection of the negative effects on child psychological well-being due to newly acquired wealth as the result of increased employment opportunities abroad. The impact of wealth status on family dynamics and

general health indicators is important to consider in future studies, particularly since pronounced changes in wealth status may have far-reaching effects on a household.

Consistent with previous work on parent-child mental health in low-income countries, the findings suggest that caretaker mental health has an important relationship with adolescent psychiatric outcomes. Although the majority of the previous studies have assessed youth in combat-exposed or post-natural disaster settings, some familial factors such as exposure to family violence and caretaker functioning have emerged as significant predictors of child mental health problems (Panter-Brick et al., 2009; Catani et al., 2010). These family factors, unfortunately, are not unique to trauma-exposed populations, and more work is needed to understand the complex interplay between parental wellbeing and established risk factors for psychiatric concerns across a variety of communities. Indeed, caretaker mental health may be particularly challenged in low- and middle-income communities, as caretakers may experience considerable economic adversity and struggle to meet basic survival needs (Reed et al., 2011). Further, the link between caretaker and child mental health is likely influenced by a variety of shared genetic and environmental risk factors. Although the present study's design did not allow us to directly examine the unique contribution of putative genetic risk factors or conduct a comprehensive assessment of the family environment, this is an area of inquiry that is of growing interest, and future study on parent-child mental health will clarify these complex generational effects. Finally, given the correlational nature of the data, it may be possible that adolescent psychiatric problems have an effect on caretaker mental health, rather than vice versa, a result that has been suggested by work in United States samples

(Bagner et al., 2013). Longitudinal study is needed to better understand the course and etiology of psychiatric concerns within families.

There are several important limitations to this study that should be noted. This survey was originally designed as a broad mental health needs assessment, and detailed information regarding the family structure and history was not collected. In particular, it is unknown whether the household reporter (i.e., the caretaker in this study) was a biological parent, a member of the extended family, or of some other relation to the adolescent. The data collection methodology stipulated that the female head of household (in many cases, the mother) would be the foremost informant, where available. In households where there was no female head of household, the household reporter may have been some other male or female relative. Despite missing data on the precise relationships among household members, each household was considered to be comprised of individuals who had lived together for the past year. Therefore, even in cases where the parent did not report on the adolescent, it may be assumed that the caretaker had sufficient information for reporting on adolescent behaviors and emotional difficulties. Also of note, the primary caretaker reported his or her own mental health difficulties and also acted as informant for adolescent mental health concerns. It is unclear whether a caretaker's existing health status may have influenced reports of adolescent mental health. For example, it is conceivable that a caretaker experiencing considerable distress may report their child as having more behavioral or emotional problems. Although some research suggests that caretakers with psychiatric symptoms tend to over-report their children's symptoms (Civic and Holt, 2000; Najman et al., 2000), other work has demonstrated no significant differences between parent and child

reports of mental health, even when the parent was experiencing symptoms of depression themselves (Lewis et al., 2012). While future study using multiple informants may eliminate this source of potential bias, previous research examining the reliability of parental reporting of depression symptoms in children indicates significant accuracy between parent report and additional informant reporting on child symptoms (Rice et al., 2007). Moreover, multiple informants may introduce multiple sources of measurement error (Merrell, 2003). Thus, while the caretaker reports may represent some limitations for interpretation, these reports may also serve as a valuable index of familial risk for youth mental health. It is also important to note that the SRQ-20 assesses only internalizing symptoms, and caretaker externalizing problems were not able to be assessed in this study. However, it appears that caretaker mental health as measured by the SRQ-20 has broad effects on youth mental health problems, and represents an important familial risk factor for Vietnamese youth.

Despite these limitations, this study offers an important first step for understanding familial and environmental factors as potential risk factors for adolescent mental health in Vietnam. The results from this study support a strong relationship between caretaker and adolescent mental health, and highlight the need for specific mental health assessments and interventions that are targeted at the family level. Demographic factors including religious affiliation, ethnicity, sex, and age also demonstrated associations with youth mental health. A clearer understanding of risk factors for the social, emotional, and physical development of children and adolescents has the promise to inform early intervention strategies, provide family education and

assistance, and develop tailored treatments that optimize limited mental health resources in low- and middle-income countries.

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Table 1: Adolescent scores on the Strengths and Difficulties Questionnaire (SDQ)

	Conduct Problems	Emotional Symptoms	Hyperactivity/ Inattention	Peer Relationship Problems	Prosocial Behavior	Total Problems
	M (SE)	M (SE)	M (SE)	M (SE)	M (SE)	M (SE)
Males	0.78 (0.05)	1.70 (0.08)	2.72 (0.07)	1.51 (0.05)	8.77 (0.07)	6.71 (0.18)
Females	0.65 (0.05)	2.28 (0.10)	2.15 (0.07)	1.54 (0.06)	9.06 (0.06)	6.62 (0.21)

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Table 2: Bivariate analyses: Exploration of potential risk factors associated with outcome on SDQ subscales.

	<i>Conduct Problems</i>		<i>Emotional Symptoms</i>		<i>Hyperactivity/ Inattention</i>		<i>Peer Relationship Problems</i>		<i>Prosocial Behavior</i>		<i>Total Problems</i>	
	Z-stat	P	Z-stat	P	Z-stat	P	Z-stat	P	Z-stat	P	Z-stat	P
Sex (0=female)	1.58	0.11	-5.15	<0.01	6.71	<0.01	-0.08	0.93	-3.75	<0.01	0.33	0.75
Age	-1.81	0.07	2.28	0.02	-3.47	<0.01	-0.93	0.35	1.82	0.07	-1.05	0.30
Religious Affiliation												
Buddhist	-0.54	0.59	-2.50	0.01	0.37	0.71	0.19	0.85	1.28	0.20	-1.05	0.30
Christian	0.53	0.60	-2.36	0.02	1.01	0.31	-0.44	0.66	0.08	0.94	-0.75	0.46
Other	0.75	0.45	-1.54	0.12	1.64	0.10	-2.10	0.04	-0.42	0.68	-0.55	0.58
None (reference)												
Ethnicity												
Rac Lay	1.14	0.25	2.74	0.01	3.31	<0.01	0.18	0.86	-2.55	0.01	2.88	<0.01
Other	-0.48	0.63	2.78	0.01	2.55	0.01	-1.72	0.08	-1.50	0.13	1.84	0.07
Kinh (reference)												
Interviewer Wealth Assessment	-0.89	0.37	13.69	<0.01	-3.65	<0.01	-2.74	0.01	1.85	0.06	-4.88	<0.01
General Physical Health												
Poor	-2.32	0.02	-8.12	<0.01	-5.27	<0.01	-1.50	0.13	1.09	0.28	-6.59	<0.01
Good (reference)												
SRQ-20 total score	6.46	<0.01	14.03	<0.01	8.64	<0.01	4.23	<0.01	-1.03	0.30	12.19	<0.01

SDQ = Strengths and Difficulties Questionnaire; SRQ-20 = Self Reporting Questionnaire-20 Item; Z-stat = Z-statistic

Table 3: Multivariate analyses including statistically significant ($P < 0.10$) variables from bivariate analyses: Risk factors associated with outcome on SDQ subscales.

	<i>Conduct Problems</i>		<i>Emotional Symptoms</i>		<i>Hyperactivity/ Inattention</i>		<i>Peer Relationship Problems</i>		<i>Prosocial Behavior</i>		<i>Total Problems</i>	
	Z-stat	P	Z-stat	P	Z-stat	P	Z-stat	P	Z-stat	P	Z-stat	P
Sex (0=female)	n/a	n/a	-5.56	<0.01	6.66	<0.01	n/a	n/a	-3.74	<0.01	n/a	n/a
Age	-2.01	0.04	1.91	0.06	-3.65	<0.01	n/a	n/a	1.76	0.08	n/a	n/a
Religious Affiliation												
Buddhist	n/a	n/a	-0.94	0.35	n/a	n/a	0.87	0.38	n/a	n/a	n/a	n/a
Christian	n/a	n/a	-2.73	0.01	n/a	n/a	-0.40	0.69	n/a	n/a	n/a	n/a
Other	n/a	n/a	-2.84	<0.01	n/a	n/a	-1.76	0.08	n/a	n/a	n/a	n/a
None (reference)												
Ethnicity												
Rac Lay	n/a	n/a	2.00	0.05	1.99	0.05	-0.48	0.63	-2.24	0.02	1.39	0.16
Other	n/a	n/a	1.85	0.05	2.18	0.03	-2.18	0.03	-1.49	0.14	0.47	0.64
Kinh (reference)												
Interviewer Wealth Assessment	n/a	n/a	1.18	0.24	-0.45	0.65	-1.77	0.08	0.96	0.34	-0.89	0.37
General Caretaker Physical Health												
Poor	1.25	0.21	-1.88	0.06	-2.12	0.03	n/a	n/a	n/a	n/a	-1.05	0.29
Good (reference)												
SRQ-20 total score	6.34	<0.01	11.74	<0.01	6.72	<0.01	3.64	<0.01	n/a	n/a	9.93	<0.01

SDQ = Strengths and Difficulties Questionnaire; SRQ-20 = Self Reporting Questionnaire-20 Item. n/a = variable was not included; only variables meeting a threshold of $P \leq 0.10$ in the bivariate analysis were analyzed in the multivariate analysis; Z-stat = Z-statistic.

Highlights

Familial factors related to youth mental health were examined in a Vietnamese sample.

Caretaker mental health had the strongest relationship with adolescent mental health.

Minority ethnicity was related to greater youth mental health problems.

Certain religious affiliations were associated with fewer youth emotional problems.

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