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ORIGINAL PAPER

Patterns and predictors of depressive symptoms among Jamaican fathers of newborns

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Abstract

Background Approximately 10% of fathers in the Cultural West (i.e., US, Europe, and Australia) experience depression. We broaden the cultural scope of paternal depression research by investigating the prevalence and predictors of depressive symptoms among Jamaican fathers.

Methods The present research draws upon structured interviews with 3425 fathers of newborn children participating in a Jamaican birth cohort study—JA Kids—and represents one of the largest sample sizes of any study on postnatal depression among fathers worldwide. This sample of fathers participated from July to September 2011, and represents approximately 30% of all men who became fathers during that time in Jamaica. Fathers answered questions about sociodemographic background, relationship status and quality, social support, health, expectations and views of a partner's pregnancy, and the ten-item Edinburgh Postnatal Depression Scale (EPDS).

Results Analyses reveal that 9.1% (95% CI 8.1–10.1) of these Jamaican fathers of newborns had EPDS scores of 10 or higher, indicative of possible depression. Results suggest that educational attainment was not related to EPDS scores, though higher indices of material wealth (e.g., refrigerator and vehicle) were weakly, negatively related to EDS scores. Paternal age was also weakly negatively predictive of EDS scores. Whereas relationship status was unrelated to depressive symptoms, relationship quality negatively predicted depressive symptoms. Several other measures of social support (lacking a close circle of friends, fewer family, or friends to help in times of trouble) were also associated with higher EPDS scores.

Conclusions We interpret these findings in light of existing work on paternal depression, including the importance of social context and support.

Keywords Fatherhood · Depression · Paternal depression · Depressive symptoms · Edinburgh postnatal depression scale

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Introduction

A growing body of research focuses on paternal depression. Several reviews provide both meta-analytical and narrative summaries of the prevalence and correlates of prenatal and postpartum depression among fathers [1–3]. Among some 43 studies and over 28,000 participants subject to meta-analysis, an average of 10.4% of men experienced depression during a child's gestation or within the year after birth [3]. However, the rates of paternal depression vary widely from 1 to 25% [2]. Reasons for the variation include different measures for assessing depression (e.g., Beck Depression Inventory vs. variable cutoffs using the Edinburgh Postnatal Depression Scale), different timepoints at which depression is assessed, and differences in study populations and attendant contextual factors (e.g., variable paternal ages, relationship dynamics with partners, and socioeconomic factors such as employment), among others.

Nearly, all studies of paternal depression have been conducted in the Cultural West, meaning countries such as the US, UK, and Australia. Among the exceptions, Gao et al. [4] determined that 10.8% of 130 Chinese fathers had depression 6 week postpartum, and Pinheiro et al. [5] found that 11.9% of 386 Brazilian fathers had depression 10 week postpartum. Among 156 Japanese fathers' 4 week postpartum, unstable employment and unintended pregnancy were associated with increased risk of depression [6]. These latter studies, like most of the literature, have sample sizes of several hundred or less, and are often convenience samples, which constrain generalizability of the findings. As the main exception to those sampling considerations, a nationally representative sample of US fathers, 9 month postpartum, found that 10% had depression [7].

Prenatal and postpartum paternal depression is patterned. A father's previous history of depression is a predictor of his experiencing paternal depression (e.g., [4]). One of the strongest predictors of paternal depression is a partner's (i.e., child's mother's) depression [3, 8]. This could be due to shared environmental factors such as poverty or less support offered by a depressed partner, or other currently undetermined factors. Other factors related to paternal depression include employment status, relationship dynamic (e.g., marital quality), wider social support, and mismatches between paternal expectations and realities; unemployed fathers, those in conflicted relationships, those with limited social support, and those with unexpected paternal demands, have higher rates of paternal depression [1]. Like adult depression generally, parental depression may be less common among men than women (e.g., [9]), but at elevated prevalence compared to background adult rates [10]. Paternal depression can comprise a variety of psychophysiological, social, and behavioral impacts of the life transition to parenting, some of these beneficial and others detrimental to fathers [11–16]. In the present study, we investigate the prevalence and predictors of depressive symptoms among fathers of newborns in Jamaica. To help situate the present study, we discuss Jamaican cultural context.

Jamaican cultural context

Family dynamics in the Caribbean, including Jamaica, have long-drawn attention from scholars, and have been noted for standing out in cross-cultural perspective. Early contributions like Edith Clarke's [17] "My Mother who Fathered Me" and Smith's [18] "West Indian Family Structure" recognized a high prevalence of matrifocal household structures in the Caribbean, in which mothers anchor the family unit [19–24]. The fluidity of sexual relationships can lead to males playing variable paternal roles [25, 26], and placing heightened importance on maternal grandmothers as sources of family support. Births frequently take place within so-called visiting relationships, in which a man living separately maintains an ongoing social and sexual relationship with his child's mother [20]. Visiting relationships sometimes transform into common-law unions, and these into formal marriage, but many also dissolve. Seventy percent of births in the Caribbean occur outside of marriage, a higher percentage than any other region of the world [20]. Households of mixed parentage often occur, meaning that fathers frequently play both biological and stepfather roles [26]. The primary paternal responsibility of African–Caribbean men tends to be viewed as economic—as financial providers, although in practice, economic constraints often mean that men fail to meet this overriding standard [21, 27]. Approximately 93% of Jamaica's population claims African descent, with the remainder a mixture of European, Native Caribbean (e.g., Taino), South Indian, Chinese, and Southwest Asian ancestry [28].

In Jamaica, recent data reveal that 49% of children are born into visiting unions, 36% common-law unions, and 15% married unions [29]. Religious affiliation and socioeconomic status are both positively associated with couples marrying, and particularly for children being born within households of already-married couples [20]. The quality of a man's relationship to a coresidential mate also helps predict his paternal involvement [20]. This Jamaican background thus recognizes considerable variation in relationship and paternal dynamics, and also points toward investigating the effects of socioeconomic status on fathers' investments and mental well-being. We draw upon these wider Caribbean and Jamaican contextual considerations to embed the present study on fathers' depressive symptoms with respect to relationship

status (visiting/common-law/marital unions), relationship quality, and assessments of men's socioeconomic status. The aims of the present study are to (1) determine the prevalence of depressive symptoms among Jamaican fathers of newborns and (2) test whether men's depressive symptoms are predicted by socioeconomic status (education, wealth), age, relationship status and quality, wider social support from kin and friends, and attitudes toward having a new child. Theory and empirical research suggest that economically disadvantaged fathers in lower quality and non-residential partnerships with fewer other sources (e.g., wider family and frends) of social support may have higher depressive symptoms.

Methods

Study design and recruitment

The proposed research builds on a national birth cohort study (JA Kids) initiated in Jamaica in summer 2011 by Samms-Vaughan, a Jamaican pediatrician and researcher. The JA Kids study included all births occurring throughout the island of Jamaica during the 3 month period July–September 2011. Of the 11,314 births across the island, some 9700 mothers (86% of the population) were recruited, answering questions concerning maternal behavior, relationship dynamics, and other domains at the time of their childrens' birth. The fatherhood arm of the cohort study relied upon biological fathers participating by answering a standardized set of questions during the first or second day postpartum when they attended birthing facilities. Responses to questions provided basic sociodemographic information as well as outcomes on various facets of the men's lives, including relationship dynamics and depressive symptoms. Birthing centers included private centers, large public hospitals, and smaller public facilities throughout the island. These fathers were drawn from across the island with the support of an extensive team of research assistants and staff at both public and private birthing locations.

A large sample of 3425 fathers participated, which represents 30% of all Jamaican fathers who had a child during summer 2011. This sample includes both first-time and experienced fathers. Fathers were not paid for their participation in a standardized face-to-face interview with trained staff that lasted 30 min on average. The interviews took place during the visiting time (of 1 or 2 h) at a birth center on the first or second day after their child was born. Fathers at virtually all Jamaican birthing centers are not allowed to attend births due to space and privacy concerns, precluding interviews during a waiting period at a birthing center. Under normal circumstances, mothers and infants return home within 2 days postpartum. Many fathers are unable to visit birthing centers within this time due to work or other constraints. The sample of fathers may represent a slightly more invested set of fathers overall, but can also be seen in light of the recruitment context. For related considerations applied to an understanding of Jamaican fatherhood and sexuality in this JA Kids study, see [30].

Ethical approval

For the study was provided by the University of the West Indies/University Hospital of the West Indies Ethical Committee and University of Nevada, Las Vegas Institutional Review Board. Written informed consent was obtained from participants.

Structured interviews

Basic sociodemographic information included items inquiring about men's age and occupation. Educational attainment was scored as 1 (primary or junior high); 2 (some or all secondary school); 3 (some or all vocational school); or 4 (some or all tertiary school). A measure of wealth was indexed as the total number of a possible ten household items (refrigerator, living room set, washing machine, vehicle, VCR/DVD, computer, air conditioning unit, electricity generator, fans, and water tank) present and working in a participant's home. Relationship status was divided into three categories: visiting relationship, common-law (living together), and married. Relationship quality was measured by a 17-item scale drawn from the Avon Longitudinal Study of Pregnancy and Childbirth [ALSPAC: see 31] based on questions such as "Did you think your relationship with your baby's mother would end soon?", with all questions referring to relationship quality "before the pregnancy". Answers ranged from "almost always" to "almost never", and possible scores on this measure of relationship quality were from 17 (highest quality) to 68 (lowest quality).

Four questions referred to a father's wider (apart from a sexual/romantic partner) social support. Options for responses to the question "How many of your relatives or your partner's relatives do you see at least twice a year?" were 1 (none), 2 (one), 3 (2–4), 4 (more than 4), or not stated/known. Options for responses to the question "About how many friends do you have?" were 1 (none), 2 (one), 3 (2–4), 4 (more than 4), or not stated/known. To the question "Overall, would you say you belong to a close circle of friends?" possible responses were 1 (yes), 2 (no), or not stated/known. With respect to "How many of your family and friends would help you in times of trouble?" response options were 1 (none), 2 (one), 3 (2–4), 4 (more than 4), or not stated/known. For multivariable analyses, men's responses to the item "How many of your relatives or your partner's relatives do you see at least twice a year" were

dichotomized to ≤4 or >4, as were men's responses to the item "How many of your family and friends would help you in time times of trouble?" Two questions addressed a father's attitude toward a partner's pregnancy: "When your baby's mother first told you she was pregnant, how did you feel about the pregnancy then?" and "How do you feel about the fact that she had a pregnancy now?" The same response options held for both questions: 1 (happy), 2 (mixed feelings), 3 (unhappy), 4 (other), or not stated/known. Some fathers did not answer all questions, resulting in fewer overall responses for specific items relative to the number of participating fathers. The variable most commonly missing was relationship status (missing 357 or 10.4% of cases), whereas no other variables was missing more than 175 cases (the number missing, totaling 5.1%, for "How many of your family and friends would help you in time times of trouble?").

Depressive symptoms were measured using the Edinburgh Postnatal Depression Scale (EPDS) [32]. The EPDS was originally developed to assess postnatal depression among mothers, but has been widely used to evaluate depression prenatally in parents and paternal depression. It is best viewed as a screening method for depressive symptoms rather than a diagnostic tool for depression, and thus, we refer to Jamaican depressive symptoms in the data obtained using this scale. The EPDS has not been validated for Jamaica, though it has been employed in at least three studies of Jamaican maternal depressive symptoms [33], and has proven adaptable in many international studies of depressive symptoms. This scale includes ten questions such as "In the past week, have you felt sad (unhappy) or miserable?" with responses ranging from 0 ("No, not at all") to 3 ("Yes, most of the time"). Seven questions were reverse scored; overall scores could thus range from 0 (no depressive symptoms) to a maximum of 30, with all questions referring to the past week. We employ a cutoff of 10 of a possible total score of 30 on the EPDS to indicate depressive symptoms, while also presenting the findings with cutoff scores of 9 and 13; cutoff scores of 9/10 and 13 are most commonly used in other studies [3]. The literature acknowledges the debates and ranges surrounding an optimal cutoff for the diagnosis of possible depression, and lacks a universal recommendation [1, 3]. When testing predictors of Jamaican paternal depressive symptoms, we use EPDS scores as a continuous dependent variable. A major advantage of using the EPDS is that it is the most widely used measure employed for evaluating parental depression, and thus enables more ready comparisons with other samples of fathers and mothers.

Statistical methods

Descriptive data are reported as frequencies and means (SD). Univariate and multivariable models rely upon general linear models (Gaussian family, identity link). A multivariable model enabled testing for predictive ability of relationship variables, measures of social support, attitudes toward pregnancy and control variables of male age, and socioeconomic status on depressive symptoms. Missing data were handled with listwise deletion.

Results

Descriptive sociodemographic and depressive symptom data

A sample of 3425 fathers of newborns participated. Men's ages ranged from 16 to 69, with a mean of 30.6 years of age (SD = 8.0 years) and median of 29 years of age. With respect to educational attainment, 23% completed primary or junior high school, 54% had some or completed lower secondary, 12% had some or completed vocational school, and 12% had some or completed tertiary school. With respect to wealth, 12% had 8–10 of the 10 material items, 46% had 5–7 items, 27% had 3–4 items, and 14% had 0–2 items. Fifteen percent of fathers reported being married, 44% were in common-law unions, and 30% in visiting relationships, with 10% indicating other/not stated. Relationship quality scores ranged from 17 (all answers of "almost always:" higher quality) to 68 (all answers of "almost never:" lower quality), with 30% of fathers scoring 17–20, 22% scoring 21–24, 13% scoring 25–28, and 4% scoring 40 and above.

The average EPDS score was 3.45 (SD = 3.95). Scores ranged from 0 to 27. Employing a score of 10 as a cutoff of possible depression, 9.1%, 95% CI [8.1, 10.1], of Jamaican fathers of newborns was at or above this threshold. With a cutoff score of 9, 11.8%, 95% CI [10.7, 12.9], of fathers of newborns were at or above this threshold. Employing a score of 13 as a cutoff of possible depression, 3.3%, 95% CI [2.7, 3.9], of Jamaican fathers of newborns was at or above this threshold. The most common EPDS score was 0, which obtained among 34.4% of respondents.

When a father's baby's mother first told him she was pregnant, 70% of fathers were happy, 25% had mixed feelings, 2% were unhappy, and 3% had other views or did not state them when asked. When asked how these same fathers felt at the birth of their child, 92% were happy, 6% had mixed feelings, 0.4% were unhappy, and 1.5% had other views or did not state them when asked. When asked about the number of relatives seen at least twice yearly, 1% reported none, 2% one, 15% 2–4, and 80% more than four relatives. Fathers reported variable numbers of friends: 3% reported none, 5% one, 18% 2–4, and 71% more than four friends. Seventy-eight percent of fathers said that they belong to a close circle of friends, in contrast to 18% saying they did not, and a few not giving a response. When asked how many family and

friends would help in times of trouble, 2% reported none, 4% one; 22% 2–4, and 67% more than four.

Univariate and multivariable predictors of Jamaican paternal depressive symptoms

Univariate analyses indicated that relationship status and educational attainment were unrelated to depressive symptoms. Age negatively predicted depressive symptoms, $B = -0.024$, $p = 0.009$, meaning that older fathers had lower depressive symptoms. Relationship quality also negatively predicted depressive symptoms, $B = 0.174$, $p < 0.005$, meaning that fathers in higher quality relationships had lower depressive symptoms. Material wealth was weakly and negatively related to men's depressive symptoms, $B = -0.065$, $p = 0.050$. Accordingly, men's age, wealth, and relationship quality were retained in a multivariable model. While both attitudes toward a partner's pregnancy when initially informed of the pregnancy, $F(3, 3290) = 38.223$, $p < 0.001$, and currently $F(3, 3305) = 35.872$, $p < 0.001$, were significantly related to men's depressive symptoms, only attitudes when initially learning of the pregnancy was employed in a multivariable model given the greater variation in responses.

Results of a multivariable GLM are given in Table 1. Results in this model concern 2983 fathers, with the sample size reflecting missing data for some items among some fathers and restriction of some outcomes (e.g., excluding from analysis not stated/known responses). These results show that fathers' age was inversely related to their depressive symptoms, $B = -0.025$, $p = 0.004$. Material wealth did not predict depressive symptoms. Fathers in higher quality partnerships reported fewer depressive symptoms, $B = 0.144$, $p < 0.001$. A more favorable attitude (happy) when informed of a partner's pregnancy predicted lower depressive symptoms, $B = -1.587$, $p = 0.001$. Seeing more relatives or friends at least twice a year was not related to men's depressive symptoms. Fathers belonging to a close circle of friends had fewer depressive symptoms than fathers not belonging to a close circle of friends, $B = -0.527$, $p = 0.004$. Fathers who had more than four family and friends who would help in times of trouble reported fewer depressive symptoms than fathers with fewer family or friends who would help in times of trouble, $B = 0.724$, $p < 0.001$.

Table 1 Multivariable GLM results predicting depressive symptoms ($n = 2983$)

	B (95% CI)	*p*
Intercept	2.452 (1.157, 3.748)	< 0.001
Paternal age	−0.025 (−0.041, −0.008)	0.004
Wealth	−0.061 (−0.122, 0.001)	0.054
Relationship quality	0.144 (0.124, 0.164)	< 0.001
Attitudes then: happy	−1.587 (−2.539, −0.635)	0.001
Attitudes then: mixed	−0.870 (−1.835, 0.095)	0.077
Relatives seen twice yearly: ≤4	−0.080 (−0.441, 0.281)	0.664
Close circle friends: yes	−0.527 (−0.885, −0.168)	0.004
Friends or family help: ≤4	0.724 (0.409, 1.040)	< 0.001

Attitudes then refers to attitudes toward a partner's pregnancy when told of a partner's pregnancy, and compared with unhappy attitudes then

Discussion

The present study represents a large and yet relatively rare contribution to an understanding of fathers' depressive symptoms. The sample size of 3425 men (and 2983 in the multivariable model) is unprecedented for the study of paternal depressive symptoms in the Caribbean and among the largest globally for understanding fatherhood and depression. The sample is likely biased toward more invested fathers, since to participate, men had to report to a hospital or birth center (so were sufficiently invested to visit facilities to see a newborn and child's mother) and were not remunerated for their efforts. The lower percentage of visiting fathers (33%) in the present sample than the previous findings by Samms-Vaughan (closer to 50%) in Jamaica is consistent with some bias toward fewer visiting fathers, who may also be in more fragile relationships with a child's mother. We also note that the relationship dynamics of this Jamaican sample bear some similarities to the US Fragile Families study, in which it has also been pointed out that visiting fathers are less likely to participate in fatherhood research than fathers in common-law or marital relationships [34, 35]. These considerations mean that any inferences drawn from the study should recognize the potential sampling bias against less-invested fathers of newborns generally and visiting fathers more specifically, although the recruitment strategy is more systematic than the majority of paternal depression studies drawn from small convenience samples. To characterize the frequency of depressive symptoms, we use the term "prevalence" cautiously given the potential sampling bias.

The 9.1% prevalence of possible depression observed in the present study is within the wide range of the previous studies globally [1–3], and very close to the overall generalization of 10% paternal depression. This Jamaican rate is slightly higher than one of the most appropriate comparisons of paternal depressive symptoms, taking place in Spain at 8.25 month gestation and using the same EPDS cutoff of 10, for which 6.5% possible was identified: [36]. The alternative cutoff score of 9 indicated 11.8% possible depression, also consistent with general findings, and the alternative cutoff score of 13 indicated 3.3% possible depression, at the low end of the previous studies. These general convergences

suggest that Jamaican fathers, like a fraction of fathers elsewhere, experience paternal depressive symptoms, and do not avoid altogether stating these when asked.

In univariate analysis, wealth, but not education, predicted Jamaican paternal depressive symptoms. This suggests that wealth and education represent different socioeconomic indicators and that having more resources may help buffer depressive symptoms. This interpretation is consistent with earlier work showing that economic contributions matter to Jamaican fathers [20] and unemployment, as a measure of socioeconomic status, was associated with higher rates of paternal depressive symptoms [37]. Social science research indicates that relative rather than absolute resource levels may matter [e.g., 38]; our measure of wealth did not assess how satisfied fathers were with their material resource standing or ability to provide resources to a new child, though evaluation of such perceptions would complement measures of absolute resource availability. That said, wealth was no longer a significant predictor of paternal depressive symptoms in a multivariable model.

Relationship quality but not relationship status predicted paternal depressive symptoms. Given that US findings which indicate non-residential fathers had higher rates of depressive symptoms than residential fathers [39], the lack of higher depression among visiting fathers in Jamaica could be viewed as surprising. We tentatively suggest that the more frequent and, therefore, more culturally acceptable, Jamaican pattern of visiting relationships (compared with samples of fathers from the US, Australia, and UK) may lessen the likelihood of finding such a relationship between paternal depression and relationship status. The likely Jamaican sampling biases could also be pertinent, if more depressed men, also more likely in more challenging visiting relationships, are under-represented. What may matter more than relationship status, then, is relationship quality (across statuses), consistent with the significant negative relationship between better quality partnerships and lower depressive symptoms [37]. Interestingly, this observation parallels findings on Jamaican fathers' testosterone levels, in which fathers' relationship quality but not relationship status predicted their testosterone at 18–24 month postpartum [40]. The effect size of relationship quality was the largest of any predictor in the multivariable model, indicating that it better accounts for depressive symptoms than age, socioeconomic status, attitudes toward learning of a partner's pregnancy, or other forms of social support.

The findings suggest that, beyond a sexual/romantic partnership, wider social support is related to paternal depressive symptoms. The measures employed here point to both wider kin and friends as differential markers of depressive symptoms. In a cross-sectional study, causation cannot be determined, so it is unclear whether having smaller social networks of kin and friends increases the likelihood of paternal depressive symptoms, or whether more depressives symptoms results in smaller social networks. Regardless, these findings point to the relevance of wider social support in men's mental health, consistent with existing findings on paternal depression [1, 41]. Moreover, the descriptive data indicate that most fathers' social networks include a variety of other kin and close friends. Seventy-one percent of fathers reported having more than four friends, and 67% stated that more than four friends or family would help in times of trouble. It is the smaller fraction of fathers lacking in such supportive networks who are more apt to experience elevated depressive symptoms.

Fathers' reported feelings toward a partner's pregnancy showed some ambivalence initially but very favorable assessments at the time of birth. When a father's baby's mother first hold him she was pregnant, 25% held mixed feelings, whereas only 6% had mixed feelings at the time of a child's birth. This pattern suggests some shift in fathers' attitudes toward a pregnancy and that the recognition of impending fatherhood can be viewed both favorably and with concern. The more ambivalent/less favorable views toward a pregnancy predicted higher paternal depressive symptoms, with the happy vs. unhappy contrast when informed of a partner's pregnancy remaining a significant predictor of paternal depressive symptoms when tested in the multivariable model at the time of the child's birth. While again, causality cannot be determined, these links point to connections between how wanted a pregnancy might be and paternal mental health.

This research was subject to limitations. The data on men's depressive symptoms and other measures relied on self-reporting. The measure of possible depression relied upon the EPDS with a specific cutoff rather than clinical diagnoses of paternal depression. Findings from the study likely under-represent the prevalence of fathers in visiting relationships. This could mean that results are biased toward men in more stable and positive relationship dynamics. The study is of fathers of newborns, meaning that results speak to associations evaluated at that time, but do not address men's histories of depression, partners' depression, or depression at other specific and variable times postpartum, particularly later postpartum.

Conclusions

In summary, the present research involves an unusually large and systematically sampled population of Jamaican fathers of newborns. Over 3000 men in Jamaica participated during a three month span in 2011. Results indicated that 9.1% of men had possible depression as indicated by a score of 10 or higher on the EPDS. While educational attainment and relationship status did not predict paternal depressive symptoms, age, relationship quality, attitudes toward a pregnancy,

and broader social support did. Fathers had lower depressive symptoms when in higher quality partnerships, when having a close circle of friends and with more available family and friends to help when needed, when older and with more material wealth, and when viewing a pregnancy more favorably. These findings are broadly consistent with the prevalence and predictors of paternal depression observed in other studies, but extend the cultural scope of such work. The findings may be of interest to clinicians, counselors, and would-be parents contemplating the effects of becoming a parent on mental health and potential family consequences, both immediately and in the future.

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Author contributions PG, JAR, CCD, TDJ, SP, AB, and MSV conceived the study. JAR, CCD, TJD, and SP collected the data. PG performed analyses, PG initially drafted the manuscript, and JAR, CCD, TDJ, SP, AB, and MSV critically revised it. PG, JAR, CCD, TJD, SP, AB, and MSV approve of the submitted manuscript.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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