

Determinants of diet and physical activity in adolescents in Mysore, India: a qualitative study

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Abstract

Background Adolescence is an important transitional period in which major physical, psychological and cognitive changes occur. Lifestyle habits during this time, particularly related to dietary behaviour and physical activity, strongly influence overall health and non-communicable disease risk in adulthood. There are gaps in knowledge about the determinants of food choices and physical activity habits of adolescents in low and middle income countries. Objectives To identify factors which influence the food choices and physical activity habits of adolescents in the South Indian city of Mysore, India. Methods Six focus group discussions were conducted in selected urban neighbourhoods of Mysore. Thirty volunteers were recruited by purposive sampling method to include younger (10-12 years old, n=12) and older (15-17 years old, n=12) adolescents, and caregivers of adolescents (n=6). The focus group discussions were conducted by investigators who were native to the region Results Despite revealing a propensity for consuming fast foods, adolescents ate home cooked meals regularly, and both young people and their parents were satisfied with the quality of the adolescents' diets. Also, all participant groups reported that adolescents regularly played and enjoyed games and sports, and did household chores as part of their physical activity. However, the pressure of schoolwork and the increasing amounts of time spent on digital devices including mobile phones were major constraints to being active. Conclusions Adolescents and caregivers perceive that Mysore adolescents' dietary habits remain satisfactory. Academic study was found to be the priority in adolescents' lives. This is recognized and accepted both socially and culturally as the right choice by parents and young people alike. Therefore, not much time or effort is spent on being active. A contradiction is that although time is considered to be a scarce commodity that necessitates careful partitioning, any surplus time is preferentially spent in playing digital games and interacting on social media. Interventions are needed to increase the amount of physical activity undertaken by Mysore adolescents.

Background

There are approximately 243 million adolescents in India [1] undergoing physical, social, and psychological transitions common to all adolescents, but with experiences specific to those growing up in transitioning countries. In general Indian lifestyle is shifting towards an 'obesogenic' profile of decreased physical activity and increased calorie intake [2]. Recent research shows that Indian adolescents' food habits and choices are mainly driven by taste and palatability of food and by time factors associated with food intake [3, 4], as is observed in Western populations [5]. Physical activity levels are known to decrease during adolescence, particularly in girls, and may be due to factors such as peer pressure and increased self-consciousness associated with exerting themselves [6, 7].

Studies on the nutritional status of adolescents from South India, including Karnataka, where the present study was conducted, reveal that micronutrient [8], and calorie and protein deficiencies [9] are still prevalent. Simultaneously, there are also studies which show that Indian adolescents are now consuming an excess of calories in the form of high fat and high carbohydrate containing fast foods [10]. As well as consuming a more unbalanced diet, South Indian adolescents are also becoming more sedentary [11], a

combination that increases risk of developing non-communicable diseases (NCD's) such as diabetes and cardiovascular disease. In contrast, there is also an emerging trend for some adolescents and young adults to want to be more 'fit' and 'in shape', and studies show that they are tailoring their diets and physical activity to achieve their fitness goals [12].

Despite efforts by the Indian Government, malnutrition persists in this population. Similarly, programmes to motivate all sections of the population to 'move' and be more physically active to combat trends towards increased weight gain and risk of NCD's, have met with minimal success. A better understanding is needed of the human factors that underlie these trends and of the social and psychological context in which South Indian adolescents are now making food and physical activity choices. The present generation of children and adolescents is growing up in a highly competitive world. Time has become a precious commodity and the manner in which adolescents manage their time and responsibilities will have long term effects on how their lives play out both in terms of their health as well as other fundamental aspects of their lives.

Qualitative research provides insights into people's perceptions and understandings of an issue and of the complex interaction between these and their behaviour. It enables a deeper understanding of the factors underlying health issues in a way which may not be amenable to a solely quantitative approach. The present qualitative study was conducted in order to understand the underlying influences and motivations that govern adolescents' eating and physical activity behaviour. As well as the views of the adolescents, the opinions of parents and caregivers of adolescents were sought. This information was gathered to inform the development of appropriate interventions to improve South Indian adolescents' nutrition and physical activity and consequently their health.

Methods

Study setting

The study was undertaken among urban-dwelling adolescents and caregivers in the South Indian city of Mysore in Karnataka, India. Mysore is a densely populated city of over 1 million residents. The housing comprises mainly individual homes and a small percentage of 3–4 storey apartment buildings. There are several parks, as well as large open spaces of undeveloped land which are available for recreational and physical activity use. The city consists of several old neighbourhoods, many of which were established more than 150 years ago, and new extensions to accommodate its growing population. The majority of the population can be classified as middle class, with about 20% living below the poverty line [13]. Occupations cover both skilled and unskilled labour.

The present study comprised 6 focus group discussions (FGD) with adolescents and caregivers/parents separately to understand the factors which influence the food intake- and physical activity-habits of adolescents from different viewpoints. Two groups were from the outskirts of the city; the rest were from centrally located neighbourhoods. All FGDs were conducted either in the participants' schools/homes or

at the Research Unit by one trained investigator (SVJ), with G.V.K., K.K., R.M.C., A.N.H. and D.K. acting observers and note takers on separate occasions. Transcripts of the FGDs were checked for quality by M.B., P.H.J. and S.W. at the University of Southampton (UoS).

Participants and recruitment

Participants were recruited from the middle class sections using purposive sampling method. The participants of one parents group and one younger adolescents group were upper middle class, one caregivers group was a mixture of upper and lower middle class individuals, and the remaining 3 adolescent groups were from a lower middle class background. The socioeconomic classification was based on area of residence, type of school attended, and education and occupation of the parents/caregivers; this assessment was not based on any standard scores. Established relationships in the community, especially with local schools and a boarding house, were helpful in participant recruitment, and in creating an environment of trust for individuals to open up and share details about their lives. Adolescents were recruited either through their schools or through their parents. Face-to-face meetings were conducted with the school principals, warden, and parents to explain the study objectives and procedures in detail. Participants were given refreshments and compensated for their travel expenses at the time of the FGD.

Ethics, consent and permissions

All study procedures were approved by the Institutional Review Board of CSI Holdsworth Memorial Hospital (CSIHMH), Mysore (CSIHMH/ERU2018/2). Written informed assent and consent were obtained from the adolescents and caregivers respectively, prior to conducting the FGD.

Data Collection

Six FGDs were conducted with a total of 30 participants; i.e. 2 groups of parents/caregivers ($n = 6$), 2 groups of younger adolescents (10–12 years old; $n = 12$), and 2 groups of older adolescents (15–17 years old; $n = 12$). All the adolescent FGDs except one (in 10–12 year olds) were conducted in mixed groups of boys and girls; almost all Mysore adolescents attend co-educational schools and are comfortable in a mixed-gender situation, especially in the context of participating in a formal research study. At the time of one younger adolescent FGD conducted at a school, the boys who had been preselected were obliged to attend another class and were therefore replaced by three 10–12 year old girls from the same school making it a single-gender group. The parent groups were purposely composed of only mothers of adolescents; in the local cultural context the mother is usually the main caregiver, and also a mixed group of fathers and mothers, especially those who are not part of the same couple, would not have been conducive to open discussion. Depending on the participants' preference, FGDs were conducted in either English or the local language, Kannada, or a mixture of the two, which is a common way of communication among Mysore residents.

FGDs were chosen as the most appropriate data collection method to obtain insights into adolescents' experiences as well as a sense of the social norms arising from group discussion [14]. Semi-structured

FGD guides comprising open-ended questions were developed to identify factors that influence the diet and physical activity habits of adolescents. These guides were developed by the Mysore research team (S.V.J., K.K., and G.V.K.) in collaboration with qualitative researchers at the UoS (P.H.J., M.B., and S.W.). The topic guide was validated by conducting two pilot FGDs. The questions in the guides were generated taking into account the local cultural and societal context and were asked in a sequence to promote a logical and smooth flow of discussion from one topic to another (FGD topic guide for adolescents can be seen in Additional File 1). The FGDs lasted between 45 and 90 minutes.

Transcription and translation

All FGDs were audio recorded and transcribed verbatim; participants were anonymised by replacing names with codes. Whenever Kannada was used, audio files were transcribed into English directly because the transcriber (S.V.J.) is fluent in both languages. The interviews thus transcribed were checked back against the original audio files to ensure accuracy.

Thematic analysis

The approach taken to qualitative research in this study is influenced by Braun and Clarke (2006) [15]. The FGD transcripts were coded using coding software NVIVO (version 12). A coding framework was initially developed at a workshop with members of the TALENT consortium (a collaboration of researchers in the UK, sub-Saharan Africa and India who have a special interest in adolescent health and the ability to conduct major population-based nutrition research in diverse low and middle income countries). Additional codes were identified in Mysore during further coding (S.J., G.V.K., K.K., P.H.J., M.B., S.W.), and in cases where there was a difference of opinion, modifications were made until a consensus was reached. As new codes were named, they were added to the original coding framework. Following the coding of all the FGD transcripts, codes that were related to each other were categorized together under broader codes to identify the main themes that emerged from the data set. Issues that were mentioned only once or by a single participant were included as additional, standalone points of view. Direct quotes from the FGDs were selected and used in the manuscript to illustrate specific issues or pieces of information that the participant wished to convey. Reporting of the study findings followed COREQ guidelines [16].

Results

Data from the FGDs are presented below as themes related to diet and physical activity.

Theme 1: Adolescents' Food Choices And Food Habits

In terms of food intake and habits, both adolescents and caregivers admitted that adolescents regularly consume and, often, prefer fast foods to home-cooked food mainly because they liked the taste.

'...it will be nice, it will be tasty' (FGD 4, 10–12 years, girl)

However, the major part of adolescents' diet consisted of home-cooked, traditional, and staple foods such as 'rice bhath' (a spicy rice dish), 'bisi bele bhath' (a mixed dish of rice and lentils), 'chapathi' (unleavened whole-wheat flat bread), 'uppittu' (a savoury semolina dish), 'poori' (deep fried wheat bread), and rice with 'sambar' (a spicy lentil curry). When asked what types of foods they considered were healthy, almost all of them spoke about eating home-cooked food in order to maintain good health.

'Should eat more home food' (FGD 6, 15–17 years, boy),

'Everything made at home is healthy and things eaten outside are unhealthy' (FGD 5, 10–12 years, girl)

There were also health risks associated with eating foods prepared outside the home, such as,

'...what they say is it's made with some kind of oil kind of thing. It's not butter 100% cream when you buy it from shops, it's not....that's why they say it's unhealthy' (FGD 4, mother),

'...they say that some chemicals have been added to the [instant] noodles....they say it's not good for health' (FGD 1, mother)

'If you eat outside you'll get food poisoning' (FGD 5, 10–12 years, girl)

Fruit, vegetables, green leafy vegetables, meat, eggs, and local staple dishes such as 'anna saaru' (rice with sambar) were repeatedly named by participants as being essential for health.

'Should eat egg' (FGD 6, 15–17 years, boy)

'Should eat rice with 'sambar', and 'muddhe' (millet dumpling)' (FGD 4, 10–12 years, girl)

They were not only aware of which foods were nutritious, but were able to elaborate why.

'In fruits and vegetables there will be more vitamins and it is good for health.' (FGD 5, 15–17 years, girl)

Participants in all FGDs were of the opinion that their diets were generally well balanced.

'As far as I'm concerned I feel that we are eating well....We are vegetarians basically so I think they [adolescents] are having a balanced diet according to me with protein, carbohydrates...uh...umm vegetables and all that.' (FGD 3, mother)

'I feel that I am eating healthily' (FGD 6, 15–17 years, boy)

A few individuals suggested that there could be room for small improvements.

'Uhh...because whenever I used to think about whatever I used to eat I thought maybe I should keep it a little less because I was eating a lot' (FGD 2, 10–12 years, girl)

Theme 2: Physical Activity Habits Of Adolescents

Subtheme 1- Types of physical activity

When adolescents were asked what types of physical activity they take part in, the most common answer was games, which included hide and seek, running and catching, skipping rope, 'kho kho' (a team sport involving running and tagging), 'stone and iron' and 'shurup current' (a modified form of running and catching). A few girls said that they played organized sports such as basketball and table tennis, and that they cycled, swam, and sometimes danced with their friends. Adolescent boys reported taking part in a variety of sports and games such as cricket, football, 'kabbadi' (a physical team sport), tennis and badminton. Adolescents also said they exercised at school in the form of Physical Education and karate, and some also said they did yoga and jogging. Parents of adolescents similarly reported that their children participated in a variety of sports and games.

'Extracurricular activities in the school like tennis she goes for tennis in the school....after come back she plays normal games' (FGD 3, mother)

Opportunities for unplanned physical activity included household and other chores for both boys and girls. Girls said they helped with sweeping, cleaning, tidying, and sometimes worked in the garden to plant and water. In contrast, boys reported that they did odd jobs for the family business or helped at home with chores which involve lifting and carrying.

'Sweeping, home cleaning, and cleaning vessels.' (FGD 6, 15–17 years, girl)

Subtheme 2- Motivators to being physically active

Adolescents were asked why they took part in different physical activities and the majority explained that it was enjoyable, and that they felt good and happy when they did so.

'I enjoy like almost every game. Ya, I feel very good playing.' (FGD 2, 10–12 years, girl)

'When we play we feel kind of happy.' (FGD 6, 15–17 years, girl)

Other motivators to engage in games and sports and be physically active in general included an opportunity to spend time with friends,

'While playing games, we can spend more time with friends.' (FGD 5, 15–17 years, boy)

meet new people,

'It's just fun like that too most of the time when I keep on meeting people and all that...' (FGD 2, 10–12 years, girl)

gain fitness and better physical appearance,

'While playing basketball people can become more tall' (FGD 2, 10–12 years, boy)

and be in better mental, emotional, and physical health.

'Mind will become free.' (FGD 6, 15–17 years, girl)

Subtheme 3- Challenges to being physically active

Despite both adolescents and parents reporting that adolescents take part in a variety of physical activities on a regular basis, it was clear that significant barriers existed that prevented or made it difficult for adolescents to do so. Adolescents reported a variety of reasons why they do not take part in physical activity such as not having company, lacking the confidence to take part in sports, parents preventing boys from playing outside for fear of getting injured, and girls being pressured to do housework instead. It was also reported that older (15–17 years) girls felt uncomfortable around boys their age and avoided playing games and sports in their presence, specifically, in a shared space such as a public playground. However, the most salient barriers that emerged were the pressure of school work and the lure of digital devices.

Subtheme 3a- School work and its influence on physical activity

When asked what challenges adolescents faced when wanting to take part in physical activity many of the participants said that school work took precedence in their lives.

'Studies stop us from playing.' (FGD 6, 15–17 years, boy)

Some adolescents said that their parents want them to focus on studies rather than playing.

'Ma'am for example we will be wanting to go out and play. But Mother will tell us to stay in and study. We'll want so much to play...when we see other children playing we'll also want to play. But in some families they won't allow the children to go out and play.' (FGD 4, 10–12 years, girl)

They also admitted to themselves recognizing the need to focus on school work and that there is so much that needs to be done, which doesn't leave much time for games and sports.

'And also to do writing...there will be so much to write, right? I too will want to go out and play but won't be able to.' (FGD 4, 10–12 years, girl)

Adolescents also reported seeing others in their age group prioritising school work over physical activity.

'They'll be only focused on their studies'. (FGD 6, 15–17 years, girl)

School work commitments included homework, assignments, and preparation for exams. Parents also reported that adolescents are burdened with school work to the extent that they have had them taken out of activities such as dance classes in order to prioritise education, which they felt to be necessary.

'Children are not getting time for the other activities, they will always be with studies and I don't see her watching movies also nor browsing. Always she will be busy in the studies only' (FGD 1, mother)

However, one mother recognized the importance of the right balance of activity and school work and lamented the fact the teenagers neither have recreational activities as part of their school/college curriculum, nor do they have time after school, which was a very different experience compared to hers as a student.

'They have the studies also. In our time and all, only particular timings we had...8 to 5 college means, 8 to 5 everyday we'll be there. After 5 o'clock [our] mind used to be free...away from the studies.' (FGD 1, mother)

The same parent also complained that adolescents in the present time have to spend even their Sundays on education-related exercises.

'Even Sunday also they are keeping the college.' (FGD 1, mother)

Subtheme 3b- Screen time and its influence on physical activity

When asked how adolescents spend their free time, the majority said that they either watch TV or spend time on their mobile phones, opining that it is even an addiction for some.

'When my sister, ok, she got food poisoning for the fifth time so she was admitted to the hospital. That's when she got *extremely* addicted to computer, she could not come out and she...like whenever I went there she hardly used to play with me. She always took the computer and just kept on seeing and seeing and seeing and seeing.' (FGD 2, 10–12 years, girl)

Adolescents said that because of this, some don't even come out of their houses, which was seen as being a problem.

'There's a guy....that fool that he always keeps on playing video games. He never comes out.' (FGD 2, 10–12 years, boy)

Some recognized that watching TV had both advantages and disadvantages, the good being that it could be a source of entertainment and the bad being the possibility of getting addicted to it and preventing them from being physically active.

'Good and bad in many ways. Depending on what perspective we take....Maybe for your entertainment...for your entertainment and joy. The bad...the bad perspective might be you get too addicted you keep on seeing it very often.' (FGD 2, 10–12 years, girl)

A few adolescents admitted that given a choice they would spend time watching TV or play games on their mobile phones to pass the time rather than go out and play. Some parents likewise said that their

children preferred to watch TV rather than play.

'She...if I allow her she would love to sit in front of TV' (FGD 3, mother)

Caregivers explained that TV and other electronic devices are a major attraction which prevent adolescents from engaging in social activities including playing and being outdoors. They also recognized the effect of digital distractions on adolescent concerns with increased body weight and body image and shape, being clear about the consequences of eating but not exercising.

'Physical activities they don't have. Morning they will get up, first they will see the mobile, then they will go have bath and go to the college. After the college they will come and they will sit and they will see the mobile. They don't have any physical activity. They fill their stomach but don't spend their energy on any physical activity' (FGD 1, mother)

It was also noted that while it's a reality that adolescents these days are over burdened with school work, they are still able to find the time to use their mobile phones either to play games or use social media.

'They have time for chatting with the friends on mobile' (FGD 1, mother)

They stressed the fact that digital gadgets have taken precedence in the lives of these young men and women, that they no longer socialize like they used to before mobile phones (especially smart phones) became so easily accessible.

Discussion

The present study was conducted to explore factors that influence food choices and physical activity levels of adolescents in Mysore, India. Previously published nutrition and physical activity data on adolescents from Mysore and other parts of Karnataka have been quantitative in nature, which have provided little insight into the drivers of their behaviour in this regard. To our knowledge this is the first study to use qualitative research methods in this setting to fill this gap in the literature. It was found that while Mysore teenagers are eating out more often, and are strongly drawn towards fast foods, they have not abandoned traditional eating patterns and home cooked food. They felt that their efforts to be physically active were constrained by the priority given to education and school work, and the increasing usage of mobile phones and other digital media/devices. This concern was echoed by the parents/caregivers.

Mysore families continue to consume traditional home-cooked meals together at least once or twice a day. Adolescents also expressed that they enjoy and prefer certain home-cooked 'healthy' dishes prepared by their mothers, even as they admitted to consuming outside foods (foods prepared outside the home) and 'junk foods' on a fairly regular basis. This is in contrast to studies elsewhere in India. Adolescents in Baroda [12] and Kolkata [4] tended to choose fast foods and junk foods over homemade meals that include higher proportions of vegetables, fruits and fibre. In general, Mysore adolescents' diet quality was not perceived to be poor either by themselves or their caregivers despite awareness of the trend, as

suggested by others [17], that adolescents are consuming larger amounts of fast foods and at higher frequencies.

The main barriers to being active were found to be similar across age groups and genders. The qualitative nature of the study drew out the reasoning, beliefs, and attitudes behind the actions which have resulted in the present nutritional and physical activity status of these individuals. Having said that, the results of our investigation are in keeping with previously published quantitative literature on the physical activity levels of Indian adolescents. A recent study on Mysore teenagers [18] showed that a high proportion (81.6%) are overweight or obese and this was positively associated with time spent on watching TV programs and inversely associated with physical activity levels. Similar trends have been observed in other cities of Karnataka [19], and other parts of the country [6]. In our study, adolescents revealed that the pressure to achieve at school severely constrained the time they had to be physically active; further, they were more likely to spend any free time on mobile phones and other digital gadgets for video games or social media rather than go out and play or engage in other physical activities. Parents of adolescents reported that since the use of smartphones became common a few years ago, they have noticed that their children are 'addicted' to them and consequently are less physically active and also socially more withdrawn. This finding is supported by previous research showing that mobile phone usage is inversely correlated with physical activity levels in teenagers [20].

Other studies have also highlighted the increasing trend in India to put pressure on adolescents to perform well in their studies in order to improve their life-chances, and the effect this has on their opportunities to be physically active. Among adolescents in Tamil Nadu [21] and Gujarat [22] academic stress was a major reason for not taking part in physical activity. In Indian society a great deal of importance is placed on performing well in school, so that when a choice has to be made, an individual will almost always choose, or be made to choose, to spend time and energy on academic studies first while secondary focus is given to everything else. Modernization and globalisation of the country has brought with it increased academic and employment opportunities, but has also created a highly competitive and stressful environment in a population of more than a billion people, where many have to strive hard to ensure access to relatively scarce resources [23].

Specifically, both parents and adolescents in the present study admitted that school work was burdensome for their children, and in order to accommodate the requirements to do well academically, they neglected physical activity. Though parents expressed sympathy and a level of concern, they also saw it as necessary, an opinion which some of the adolescents shared. Overall, being physically active is not a top priority for either Mysore adolescents or their parents.

Implications

The insights provided by this study may be useful in designing programmes and interventions to improve the diet and physical activity levels of Mysore adolescents. Though FGD participants admitted to regular consumption of fast foods and a mild desire to increase intake of healthier foods, they believed that

adolescents' nutritional requirements are being met. This type of complacency might prevent objective evaluation of one's diet and identification of dietary/nutritional deficits, as well as foster an unwillingness to modify habits. Participants also highlighted lower levels of physical activity, mainly due to academic pressure. Some adolescents, especially with parental support, were able to overcome the obstacles of excessive school work and lure of mobile phones, while others said they had neither the time nor the inclination to do so. This difference in decision making may be explained by Bandura's 'self-efficacy' concept which posits that one is more likely to attempt something if one is confident that they can perform it successfully [24]. Studies show that adults and adolescents who have higher perceived self-efficacy are more likely to engage in physical activity [25]. Therefore, possible interventions to increase physical activity among Mysore adolescents could be aimed at increasing self-efficacy, as well as providing motivational support.

Strengths and limitations

A major strength of this study was that we included not only adolescents, but also caregivers and parents which helps us to understand the situation from different viewpoints, and also to corroborate one population's account of their experience by listening to the other. An additional strength was that this was part of a collaborative project and the investigators who conducted the study underwent thorough training by a group of experts in the field of qualitative research. Also, having only mothers in our parents group was useful in creating a comfortable environment in which the women could openly share their views and concerns regarding their children without the awkwardness of speaking in front of men. However, this was also a limitation in our study since this decision was based on the assumptions of the investigators, and including fathers in the FGD might have elicited an entirely different set of views. Similarly, a strength of the study was using mixed gender groups of teenagers based on the fact that it was a 'non-sensitive' topic and that all the participants were comfortable in such a setting because they attend co-educational schools. This may, however, also have been a limitation because adolescents may have felt inhibited to discuss certain issues which they might have otherwise done in a single-gender setting. Even though the recruitment strategy was designed to include similar numbers of boys and girls in the adolescent groups, there were more girls in both the younger groups. This means that boys in the 10–12 year old range were not equally represented and their issues and viewpoints were not fully explored and highlighted. Moreover, due to difficulty with recruitment, mini FGDs (n = 3) were conducted in the caregivers/mothers groups [26]. Further studies in which both genders are equally represented, and with an optimum number of participants would be desirable.

Conclusions

Adolescents and caregivers perceive that while Mysore adolescents' dietary habits remain satisfactory, their physical activity levels are on the decrease. The results of this study offer an explanation for this apparent trend. Adolescence is a crucial stage of development. The lifestyle choices made during this phase of life will have irrevocable effects on not only their own health but also of future generations. A

way to reverse this trend may be to identify interventions that are aimed towards increasing adolescents' motivation to be more physically active.

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Declarations

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Author's contributions

The study was designed by CF, KK, GVK, MB; data collection was done by SVJ, GVK, KK, RMC, DK; data analysis was done by SVJ, GVK, KK, SW, PHJ, MB, CF; manuscript was prepared by SVJ, SW, PHJ, MB, SHK, CF. The final version of the manuscript was read and approved by all the authors.

Ethics declarations

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the Institutional Review Board of CSI Holdsworth Memorial Hospital, Mysore. Written informed consent was obtained from all subjects/patients.

Consent for publication:

Not applicable

Availability of data and materials:

The study data are not freely available. The data is available to researchers on request subject to institutional and national guidelines. For further information contact the corresponding author.

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