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Research Article

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Effect of the COVID-19 pandemic on the status of overweight and obesity among children and adolescents: a retrospective study in Chengdu, China

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Background: The prevalence of overweight and obesity among children and adolescents is steadily increasing and has become a public health concern. Lifestyle changes due to the COVID-19 pandemic may have an impact on the status of overweight and obesity among children and adolescents. This study aimed to analyze the effect of the COVID-19 pandemic on the status of overweight and obesity among children and adolescents.

Methods: We retrospectively analyzed the children and adolescents who visited the West China Second University Hospital, Sichuan University from January 1st, 2018 to June 30st, 2020. We included obese children who met the criteria and divided them into 5 groups with 6 months as the unit according to the time of their visit. The national lockdown time was used as a segmentation point to study the changes of obesity status in the same children before and after lockdown.

Results: A total of 140,526 children and adolescents visited the outpatient department from January 1st, 2018 to June 30st, 2020, and 1,740 of them were diagnosed as overweight or obese at the time of their first visit. The study found that there was a significant difference in the obesity rate among the groups ($P < 0.01$). However, there was no difference between January to June, 2020 and the previous period. Except for the increased incidence of VD deficiency ($P < 0.01$), the severity of obesity, insulin resistance and dyslipidemia of obese children did not change before and after COVID-19 ($P=0.303, 0.663, 0.106$, respectively). A total of 65 obese children were followed up in the outpatient department before and after COVID-19 lockdown. There were no significant differences in BMI-SDS, HOMA-IR and 25(OH)VD among obese children before and after lockdown ($p = 0.626, 0.386, 0.251$, respectively).

Conclusions: The available evidence cannot prove that the COVID-19 pandemic affects the status of overweight and obesity among children and adolescents who visited hospitals. It may be related to the multiple effects of the COVID-19 pandemic on children.

Keywords: COVID-19 pandemic, childhood obesity, Insulin resistance, VD deficiency, Dyslipidemia

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1 **Introduction**

2 Overweight and obesity have become a global public health concern (1), and this trend is also
3 becoming more obvious in children (2). It was reported that in 2015, 12% of adults and 5% of
4 children in the world met the diagnostic criteria for obesity. Although the obesity rate of
5 children is lower than that of adults, it is rising faster than that of adults (3,4). From 1997 to
6 2015, the incidence of overweight, obesity and severe obesity of children in China increased
7 from 4.6% to 21.1%, 1.4% to 10.1%, and 0.2% to 4.0%, respectively (5). And researches have
8 shown that Obesity is associated with a variety of diseases, such as type 2 diabetes and
9 cardiovascular disease(6-8) and obesity in childhood is associated with an increased risk of
10 cardiovascular death in adulthood(9). And early detection of cardiovascular problems in obese
11 children can help reduce long-term complications(10).

12 COVID-19 pandemic swept the world by the end of 2019 and the beginning of 2020. As of
13 September 20st, 2020, there had been 30,675,675 confirmed cases of COVID-19 worldwide,
14 including 954,417 deaths (11). In order to slow down the spread of COVID-19, most places of
15 China implemented a comprehensive lockdown policy, and this lockdown policy changed
16 people's lifestyle, especially in terms of physical activity and eating habits, which may have an
17 impact on people's weight (12).

18 Studies have reported that the implementation of lockdown measures during COVID-19
19 pandemic reduces physical activity in adults and leads to an increase in body mass index(BMI)
20 (13). For children and adolescents, although some scholars believe that school closures during
21 COVID-19 pandemic may result in reduced physical activity and increased unhealthy diets,
22 resulting in weight gain (14), which is also found in clinical practice, others believe that the
23 pandemic may reduce the risk of childhood obesity (15). The relevant research in this area has
24 not been reported. Therefore, we retrospectively analyzed the children who visited the West
25 China Second University Hospital, Sichuan University from January 1st, 2018 to June 30st, 2020,
26 trying to find the effect of COVID-19 pandemic on the overweight and obesity of children and
27 adolescents.

28 **Materials and Methods**

29 **Study population:** A total of 140,364 children and adolescents aged 2-18 years visited the West
30 China Second University Hospital, Sichuan University from January 1st, 2018 to June 30st, 2020.
31 We included children or adolescents who first visited the outpatient during the study period
32 and were diagnosed as overweight or obese according to the diagnostic criteria.The exclusion
33 criteria were obese children with conditions that may affect the BMI, such as central precocious
34 puberty, growth hormone deficiency dwarfism, chronic kidney disease, Autoimmune and
35 chronic kidney diseases requiring hormone therapy, etc. Further, we included obese children
36 who were followed up at the outpatient during the study period and visited the outpatient
37 before and after the COVID-19 pandemic national lockdown time(January 23st, 2020),
38 respectively.

39 **Data collection:** We collected basic information about children and adolescents, such as sex,
40 date of birth, date of diagnosis, age at diagnosis, height, weight, comorbidities through the
41 hospital case system. We divided the study period into 5 groups with 6 months as the unit, and

1 each obese child was divided into 5 groups according to the date of diagnosis. All
2 measurements of children's height and weight were carried out and recorded by
3 specially-trained personnel in accordance with standards. BMI is a person's weight in kilograms
4 divided by the square of height in meters and the formula is $\text{weight (kg)} / [\text{height (m)}]^2$.
5 BMI-SDS was calculated based on height and weight in kilograms/meter² and adjusted
6 for sex and age according to Chinese growth curves(16). We collected the laboratory results of
7 children and adolescents through the hospital laboratory system, such as fasting blood
8 glucose(FBG), fasting insulin(INS), 25-hydroxyvitamin D(25 (OH) D), total cholesterol(TC),
9 low-density lipoprotein cholesterol(LDL-C), high-density lipoprotein cholesterol(HDL-C) and
10 triglyceride(TG). All laboratory results were obtained during normal clinical activities. FBG, INS,
11 TC, LDL-C, HDL-C and TG were measured in the morning under fasting status. All laboratory
12 tests were carried out by professional personnel. The study has been granted an exemption
13 from requiring ethics approval and informed consent by the Ethics Committee of West China
14 Second University Hospital of Sichuan University because of following factors. Firstly, the
15 COVID-19 pandemic is a public health emergency that cannot be predicted in advance.
16 Secondly, we collected patient's anonymous data retrospectively and were unable to track the
17 anonymous data. Thirdly, we only used data from normal clinical activity during the study and
18 promised not to misuse it.

19 **Definitions:** Obesity: According to the Chinese textbook 《Pediatrics Children》, overweight in
20 children (>2 years old) was defined as BMI between the 85th percentile and 95th percentile of
21 the growth standard curve (P85-P95), obesity was BMI above the 95th percentile
22 (>P95)(17). For severe obesity, we refer to the USCDC standard which was defined as BMI
23 greater than 120% of the 95th percentile or BMI greater than 35 kg/m² (18). The growth
24 standard curve refers to the growth curve of Chinese children aged 0-18 years in 2009 (16).
25 Insulin resistance: Whether children had insulin resistance was estimated using homeostasis
26 model assessment of insulin resistance (HOMA-IR) (19). The calculation formula was
27 $\text{HOMA-IR} = \text{FBG}(\text{mmol/L}) \times \text{INS}(\text{mIU/L}) / 22.5$. According to WHO recommendations, higher than
28 the highest quartile of HOMA-IR in non-diabetic subjects was considered to be insulin
29 resistance (20). For Chinese children, the threshold was $\text{HOMA-IR} > 3$ (21). Vitamin D (VD)
30 deficiency: the status of vitamin D was graded according to the serum 25 (OH) D level: the
31 serum 25 (OH) D > 250nmol/L was toxicosis, 50-250nmol/L sufficient. 30-50nmol/L
32 insufficient and < 30nmol/L deficient (22). Dyslipidemia: dyslipidemia was assessed on the
33 basis of TC、LDL-C、HDL-C and TG. Dyslipidemia was defined as abnormality of any of the four
34 indicators. The abnormalities in the four indicators were $\text{TC} \geq 200\text{mg/dL}$, $\text{LDL-C} \geq 130\text{mg/dL}$,
35 $\text{HDL-C} < 40\text{mg/dL}$, TG: 2-9 years old $\geq 100\text{mg/dL}$ and 10-18 years old $\geq 130 \text{mg/dL}$ (23).

36 **Statistics:** SPSS 21.0 was used for statistical analysis of the data obtained in the study.
37 Categorical variables were expressed as frequencies (n) and percentages(%) and analyzed by
38 the Chi-square test. Continuous variables were expressed as mean \pm standard deviation (SD)
39 and compared using one-way ANOVA. Chi-square test was used to analyze the changes of
40 obese children in different time periods. The continuity variables of obese children who visited
41 the outpatient before and after COVID-19 pandemic lockdown were tested for normality.
42 Those with approximate normal distribution were analyzed by paired t test, and those without
43 were analyzed by wilcoxon signed ranks sum test. A p -value < 0.05 was considered statistically

1 significant.

2 Results:

3 The incidence of childhood obesity at different time periods:

4 A total of 140,364 children and adolescents visited the outpatient department of the West
5 China Second University Hospital, Sichuan University from January 1st, 2018 to June 30st, 2020.
6 Among them, 1,740 children were diagnosed as overweight or obese at the time of their first
7 visit. The obesity rates of the five time groups: January to June in 2018, July to December in
8 2018, January to June in 2019, July to December in 2019, January to June in 2020 were 1.1%,
9 1.5%, 1.1%, 1.4%, 1.2%, respectively. Among them, the incidence of obesity was significant
10 lower in January to June in 2018 and 2019 than in July to December in 2018 and 2019($p < 0.01$).
11 However, there was no statistical difference between each group and January to June,
12 2020(Table 1)

Time	1-6, 2018 ^a (n=26534)	7-12, 2018 ^b (n=28433)	1-6, 2019 ^a (n=28926)	7-12, 2019 ^b (n=30343)	1-6, 2020 ^{a,b} (n=26128)	P
	N (%)	N (%)	N (%)	N (%)	N (%)	
Normal	28,254 (98.9)	28,013 (98.5)	28,619(98.9)	29,924(98.6)	25,814(98.8)	<0.01
Obesity	280 (1.1)	420 (1.5)	307(1.1)	419(1.4)	314(1.2)	

TABLE 1|The obesity rate of outpatient visits of children in different time groups

Each superscript letter represents a subset of the column time categories, with column proportions not significantly different from each other at the 0.05 level.

1-6, 7-12 refers to the months of the year

13 The characteristics of the study population:

14 A total of 1,740 children and adolescents diagnosed as overweight or obese were enrolled. The
15 sex and age baselines for obese children were comparable across time periods(Table 2).
16 Among the obese children, 53.4% were male and 46.6% were female, with an average age of
17 9.32 ± 2.532 years. Most of them were diagnosed as obesity (60.4%), 42% had insulin resistance,
18 46.1% had VD insufficiency or deficiency and 42.8% had dyslipidemia. The relationship

variables	1-6. 2018(n=280)	7-12. 2018(n=420)	1-6. 2019(n=307)	7-12. 2019(n=419)	1-6. 2020(n=314)	P
	N (%)	N (%)	N (%)	N (%)	N (%)	
boy	158(56.4)	219(52.1)	162(52.8)	221(52.7)	170(54.1)	0.829
girl	122(43.6)	201(47.9)	145(47.2)	198(47.3)	144(45.9)	
Age	9.26 ± 2.711	9.21 ± 2.443	9.33 ± 2.664	9.38 ± 2.576	9.29 ± 2.96	0.078

19 between the severity of obesity and sex, age, glycometabolism, VD level and lipid metabolism
20 was significant($p < 0.01$, < 0.01 , < 0.01 , 0.016 , < 0.01 , respectively)(Table 3).

TABLE 2|The basic characteristics of obese children in different time groups

Variables	Overweight N(%)	Obesity N(%)	Severe Obesity N(%)	<i>p</i>
Sex	N=295	N=1051	N=394	< 0.01
Boy	209 (70.8)	524 (49.9)	197 (50.0)	
Girl	86 (29.2)	527 (50.1)	197 (50.0)	
Glycometabolism	N=183	N=700	N=307	< 0.01
Non-IR	119 (65.0)	429 (61.3)	142 (46.3)	
IR	64 (35.0)	271 (38.7)	165 (53.7)	
VD status	N=211	N=759	N=296	0.016
sufficient	130 (61.6)	408 (53.8)	145 (49.0)	
insufficient	74 (35.1)	298 (39.3)	122 (41.2)	
deficient	7 (3.3)	53 (6.9)	29 (9.8)	
Lipid Metabolism	N=125	N=578	N=266	0.002
Non-Dyslipidemia	82 (65.6)	343 (59.3)	129 (48.5)	
Dyslipidemia	43 (34.4)	235 (40.7)	137 (51.5)	
Age	10.91 ± 2.179	9.15 ± 2.456	8.59 ± 2.487	< 0.01

TABLE 3 | The basic characteristics and metabolic status of children with different levels of obesity

The n outside the brackets denotes the number of children with this characteristic at that level of obesity. % in parentheses indicates the percentage of children with this characteristic at this obesity level.

Counting data were tested by chi-square test, and measurement data were analyzed by one-way analysis of variance.

1 **The situation of obese children at different time periods:**

2 The VD deficiency rate of obese children was significant higher in January to June, 2020 than in
3 2018 and July to December, 2019 ($p < 0.01$)(Table 4). Further study found that this difference
4 was only found in children diagnosed as obese and severely obese ($p < 0.01, 0.037,$
5 respectively), while there was no significant change in VD deficiency rate in overweight
6 children ($p = 0.893$)(Table 5). However, there were no significant differences in the severity of
7 obesity, insulin resistance and dyslipidemia among obese children at different time periods (p
8 = 0.303, 0.663, 0.106, respectively)(Table 4).

9

Variables	1-6. 2018 N(%)	7-12. 2018 N(%)	1-6. 2019 N(%)	7-12. 2019 N(%)	1-6. 2020 N(%)	<i>p</i>	TABLE 4 The severity of obesity and metabolic status of obese children in different time groups
Diagnosis	N=280	N=420	N=307	N=419	N=314	0.303	
Overweight	42 (15.0)	60 (14.3)	53 (17.3)	82 (19.6)	58 (18.5)		
Obesity	177 (63.2)	262 (62.4)	181 (59.0)	255 (60.8)	176 (56.1)		
Severe Obesity	61 (21.8)	98 (23.3)	73 (23.7)	82 (19.6)	80 (25.4)		
Glycometabolism	N=206	N=280	N=204	N=295	N=205	0.663	
Non-IR	128 (62.1)	159 (56.8)	117 (57.4)	173 (58.6)	113 (55.1)		
IR	78 (37.9)	121 (43.2)	87 (42.6)	122 (41.4)	92 (44.9)		
VD status	N=211	N=300	N=210	N=309	N=236	< 0.01	
Sufficient	130 (61.6) ^a	181 (60.3) ^a	84 (40.0) ^b	176 (57.0) ^{a,c}	112 (47.5) ^{b,c}		
Insufficient	75 (35.5) ^a	109 (36.3) ^a	93 (43.3) ^a	120 (38.8) ^a	97 (41.1) ^a		
Deficient	6 (2.8) ^a	10 (3.3) ^a	33 (15.7) ^b	13 (4.2) ^a	27 (11.4) ^b		
Lipid Metabolism	N=187	N=238	N=159	N=231	N=154	0.106	
Non-Dyslipidemia	120 (64.2)	126 (52.9)	96 (60.4)	123 (53.2)	89 (57.8)		
Dyslipidemia	67 (35.8)	112 (47.1)	63 (39.6)	108 (46.8)	65 (42.2)		

Each superscript letter represents a subset of the column time categories, with column proportions not significantly different from

each other at the 0.05 level.

The n outside the brackets denotes the number of children with this characteristic in this time group. % in parentheses indicates the percentage of children with this characteristic at this time group.

Chi-square test was used.

TABLE 5 | The incidence of VD deficiency in children with different severity of obesity in different time groups

Diagnosis	1-6, 2018	7-12, 2018	1-6, 2019	7-12, 2019	1-6, 2020	<i>p</i>
	N(%)	N(%)	N(%)	N(%)	N(%)	
overweight	N=31	N=40	N=35	N=62	N=43	
Sufficient	21(67.7)	25(62.5)	20(57.1)	38(61.3)	26(60.5)	0.893*
Insufficient	10(32.3)	14(35.0)	14(40.0)	22(35.5)	14(32.6)	
Deficient	0(0.0)	1(2.5)	1(2.9)	2(3.2)	3(7.0)	
Obesity	N=126	N=182	N=128	N=186	N=137	
Sufficient	83(65.9)	110(60.4)	43(33.6)	108(58.1)	64(46.7)	<0.01
Insufficient	39(31.0)	67(36.8)	63(49.2)	72(38.7)	57(41.6)	
Deficient	4(3.1)	5(2.8)	22(17.2)	6(3.2)	16(11.7)	
Severe obesity	N=54	N=78	N=47	N=61	N=56	
Sufficient	26(48.1)	46(59.0)	21(44.7)	30(49.2)	22(39.3)	0.037
Insufficient	26(48.1)	28(35.9)	16(34.0)	26(42.6)	26(46.4)	
Deficient	2(3.8)	4(5.1)	10(21.3)	5(8.2)	8(14.3)	

*The expected count of 5 cells (33.3%) is less than 5. The minimum expectation count is 1.03.

The n outside the brackets denotes the number of children with this characteristic in this time group. % in parentheses indicates the percentage of children with this characteristic at this time group.

Chi-square test was used.

1 **Obese children before and after lockdown:**

2 A total of 65 obese children were followed up in the outpatient department of West China
 3 Second University Hospital, Sichuan University before and after lockdown. Among them, 34

1 children had FBG and INS tested twice and 37 children were examined twice for serum 25 (OH)
 2 D. However, there were no significant differences in BMI-SDS, HOMA-IR and 25(OH)VD among
 3 obese children before and after lockdown (p = 0.626, 0.386, 0.251, respectively)(Table 6).

TABLE 6 | The changes of BMI SDS and metabolic status in children before and after lockdown.

^aThe difference follows normally distributed and the paired t test is used.

^bThe difference does not follow normal distribution and the Wilcoxon signed ranks sum test is used

4 Discussion

5 We retrospectively analyzed the children and adolescents who visited the West China Second
 6 University Hospital, Sichuan University from January 1st, 2018 to June 30st, 2020, trying to find
 7 the impact of COVID-19 pandemic on overweight and obesity among children and adolescents.
 8 There was no significant change in the obesity rate of children visiting the hospital from
 9 January to June, 2020 compared with that in the previous period. In addition to the increased
 10 incidence of VD deficiency, the severity of obesity, insulin resistance and dyslipidemia in obese
 11 children did not change. Therefore, it has not been demonstrated that the pandemic affects
 12 the obesity status of children and adolescents visiting the hospitals.

13 Although there was a slight increase from January to June, 2020 in childhood obesity
 14 compared to that from January to June in 2018 and 2019, and a slight increase in severe
 15 obesity rate among obese children, which was consistent with what we saw in the outpatient
 16 department, these differences were not significant. This is contrary to the opinion of Andrew G
 17 et al(14). The lockdown during the COVID-19 pandemic caused the closure of schools, and

Variables	Pre-lock N(%)	Post-lock N(%)	P
BMI SDS N=65	3.07 ± 1.612	3.01 ± 1.424	0.626
HOMA-IR N=34	4.93 ± 7.637	5.85 ± 13.253	0.386
25 (OH)D N=37	F+ 406	F- 260	0.251

18 studies
 19 have
 20 shown
 21 that
 22 out-of-s
 23 chool
 24 environ
 25 ment
 26 may
 27 increase
 28 the BMI of children (24-25). Studies have shown that the COVID-19 pandemic lockdown leads
 29 to changes in children's behavior: increased sugar intake and sleep time, and decreased

1 exercise time, which may have a negative impact on children's obesity(26). But lockdown also
2 caused the closure of restaurants (27), reducing the rate of children eating outside, and
3 increasing the healthy diet at home (28-29), which could have a beneficial impact on childhood
4 obesity. The obesity rates were higher in the second half of 2018 and 2019 than in the first half,
5 with a slight increase in severe obesity rate among obese children. The possible reason is that
6 children have more physical activity and less sedentary in spring, and the opposite in winter
7 (30), which could lead to lower obesity rates in the spring and higher obesity rates in the winter.
8 For obese children who were followed-up in outpatient department and visited the outpatient
9 department before and after lockdown respectively, there was a slight decrease in BMI-SDS,
10 although this was not statistically significant. This was similar to the findings of Donald A et al,
11 which was that overweight children tended to lose weight and normal-weight children tended
12 to gain weight, which may be related to the measures taken by obese children to control their
13 weight(31).

14 Obesity may increase the incidence of VD deficiency in children (32-33), which may be due to
15 reduced expression of vitamin D25-hydroxylase CYP2R1 in the liver of obese children (34) and
16 excessive 25 (OH)D accumulation in adipose tissue (35). In addition, the lack of VD in children
17 may aggravate systemic inflammation, affect insulin sensitivity but also beta-cell function in
18 non-diabetic overweight and obese children and adolescents and may even affect COVID-19
19 infection(36-38). Therefore, we studied the changes of VD. The VD deficiency rate of obese
20 children in January to June, 2020 was increased compared with that in January to June, 2018
21 and July to December, 2018. This may be attributed to the implementation of social lockdown
22 measures reduces children's time for outdoor activities which may have a beneficial impact on
23 VD level (39). However, This change in VD deficiency was seen only in children diagnosed as
24 obese and severely obese, but not in overweight children. This may be due to the negative
25 correlation between VD level and BMI, and the heavier the degree of obesity, the worse the VD
26 level (40), which was consistent with the relationship between obesity and VD levels seen in our
27 study. However, there was no significant reduction in 25 (OH)D in obese children who were
28 followed up in the outpatient department and visited the outpatient department before and
29 after the lockdown respectively, which may be related to the long-term vitamin D
30 supplementation in children who were followed up in the outpatient department.

31 Strengths: Till now, there is few report to analyze the impact of COVID-19 pandemic on
32 overweight and obesity among children and adolescents, which is the great strength of this
33 article. Moreover, the study population was from one of the largest pediatric hospitals in
34 southwest China, with a large and representative sample size. And we analyzed the obese
35 children with the long-term follow-up in the outpatient department, and found that there was
36 no significant change in the obesity status of these children, which may have implications for
37 the follow-up of obese children in the future.

38 Limits: There are some limitations in our study, which need further study to improve. Firstly, the
39 number of patients visited before and after the lockdown respectively is relatively small, which
40 may lead to false negative results. Moreover, due to the lack of clinical collection of obesity risk
41 factors(family history, bad behavior) and deal with factors(Dietary guidelines,drugs), we can
42 not explore the underlying causes, which may be a focus of future research. In addition, as the
43 observation date of this study is June 30st, 2020, we can only analyze one set of data after the

1 outbreak of COVID-19. COVID-19 pandemic affects people' life far beyond this period, which
2 should be integrated with longer term or even better longitudinal data.

3 **Conclusion**

4 When we focus on the impact of COVID-19 pandemic on lifestyle, we cannot ignore the impact
5 of lifestyle changes on childhood obesity. our study cannot prove that the COVID-19 pandemic
6 affect the status of overweight and obesity among children and adolescents who visited
7 hospitals, but provides a direction for future research, and suggests that it is necessary to
8 prevent childhood obesity by implementing measures such as proper outdoor exercise and
9 reasonable diet.

10 **Abbreviations**

11 body mass index BMI

12 fasting blood glucose FBG

13 fasting insulin INS

14 25-hydroxyvitamin D 25 (OH) D

15 total cholesterol TC

16 low-density lipoprotein cholesterol LDL-C

17 high-density lipoprotein cholesterol HDL-C

18 Triglyceride TG

19 United States Centers for Disease Control and Prevention standards USCDC

20 homeostasis model assessment of insulin resistance HOMA-IR

21 Vitamin D VD

22

23 **Declarations**

24 **Ethics approval and consent to participate**

25

26 The study has been granted an exemption from requiring ethics approval and informed
27 consent by the Ethics Committee of West China Second University Hospital of Sichuan
28 University because of following factors. Firstly, the COVID-19 pandemic is a public health
29 emergency that cannot be predicted in advance. Secondly, we collected patient's anonymous
30 data retrospectively and were unable to track the anonymous data. Thirdly, we only used data
31 from normal clinical activity during the study and promised not to misuse it.

32

33 **Consent for publication**

34 Not applicable.

35

36 **Availability of data and materials**

37 The datasets used and/or analysed during the current study are available from the
38 corresponding author on reasonable request.

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Competing interests

The authors declare that they have no competing interests

Funding

The authors declare that the research was conducted in the absence of any funding.

Authors' contributions

ML and FY contributed to conception and design of the study. ML, LKL and XH organized the database. SFY and JHS performed the statistical analysis. ML wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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