Literature review

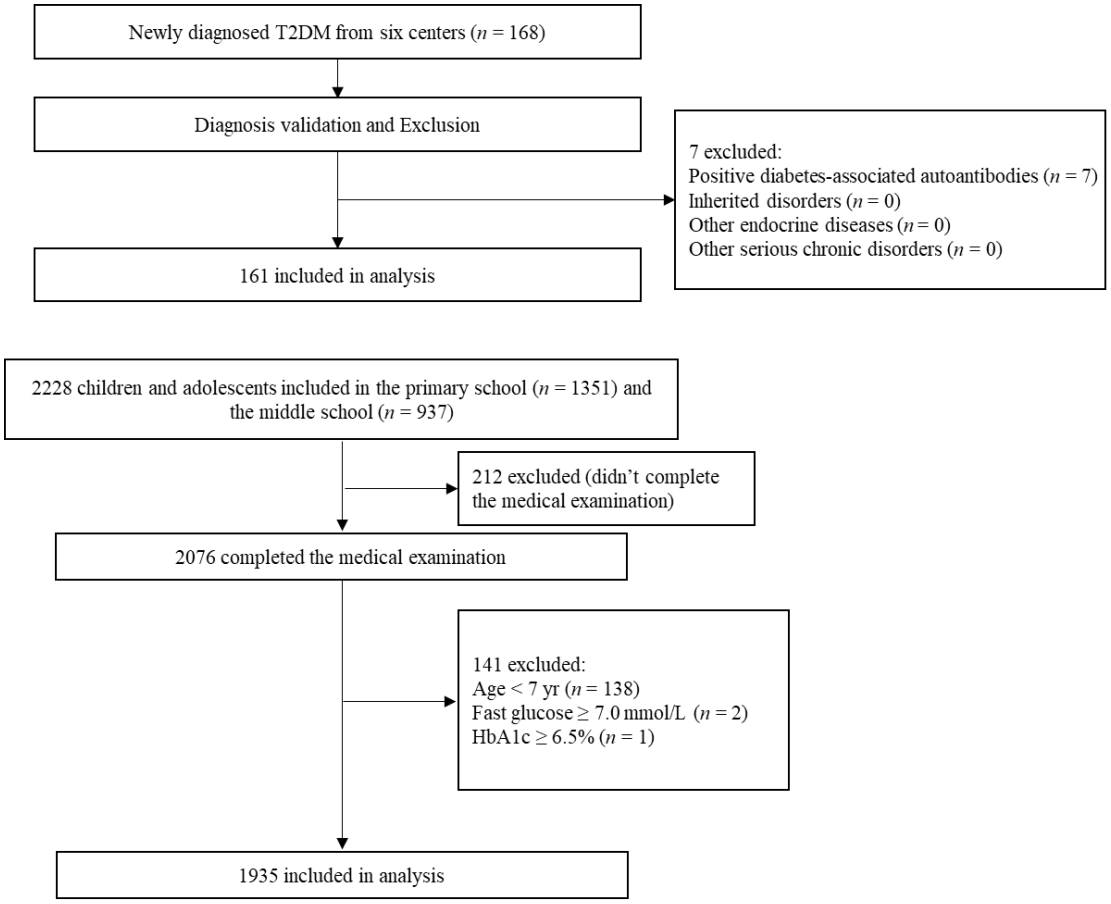
We searched PubMed and the Web of Science from Jan 1, 2000, to December 20, 2019, for reports published in English, and searched the China National Knowledge Infrastructure (CNKI) and Wanfang Data up to December 24, 2019, for reports published in Chinese. In brief, the search hedge included 3 parts: (1) terms related to T2DM, including "Diabetes Mellitus, Type 2", "type 2 diabetes", "Non-Insulin-Dependent Diabetes Mellitus", "NIDDM", "Type 2 Diabetes Mellitus", "Adult-Onset Diabetes Mellitus", "Noninsulin Dependent Diabetes Mellitus", and "Noninsulin-Dependent Diabetes Mellitus"; (2) terms restricted to children and adolescents, including "Child", "Children", "Adolescent", "Adolescence", "Teen", "Teenager", "Youth", and “pediatric”; and (3) terms related to clinical characteristics, prevalence, or incidence, including "Clinical feature", "Clinical characteristic", "Clinical character", "Incidence", and "Prevalence". The reference lists of related reviews and articles were also used to search for relevant reports. After the removal of duplicates, the titles and abstracts were screened to exclude irrelevant studies. The full texts of the remaining studies were assessed to determine whether they met the inclusion or exclusion criteria.

To be included, studies had to be cross-sectional or population-based in design to describe the features of local pediatric T2DM patients aged < 19 years. A study was excluded if (1) the diagnostic criteria for T2DM were unclear, did not conform to the guidelines of the American Diabetes Association or ISPAD, or could not be used to exclude other types of diabetes; (2) the study did not report the male-female ratio of T2DM patients or the ratio could not be calculated from the presented data; (3) the study reported results that were not restricted to patients aged 0–19 years; (4) the study was restricted to a particular group; (5) the study was a report that repeated the data of other studies; or (6) the full text was not available. The flow chart of the literature review is illustrated in Supplementaary Figure 2.

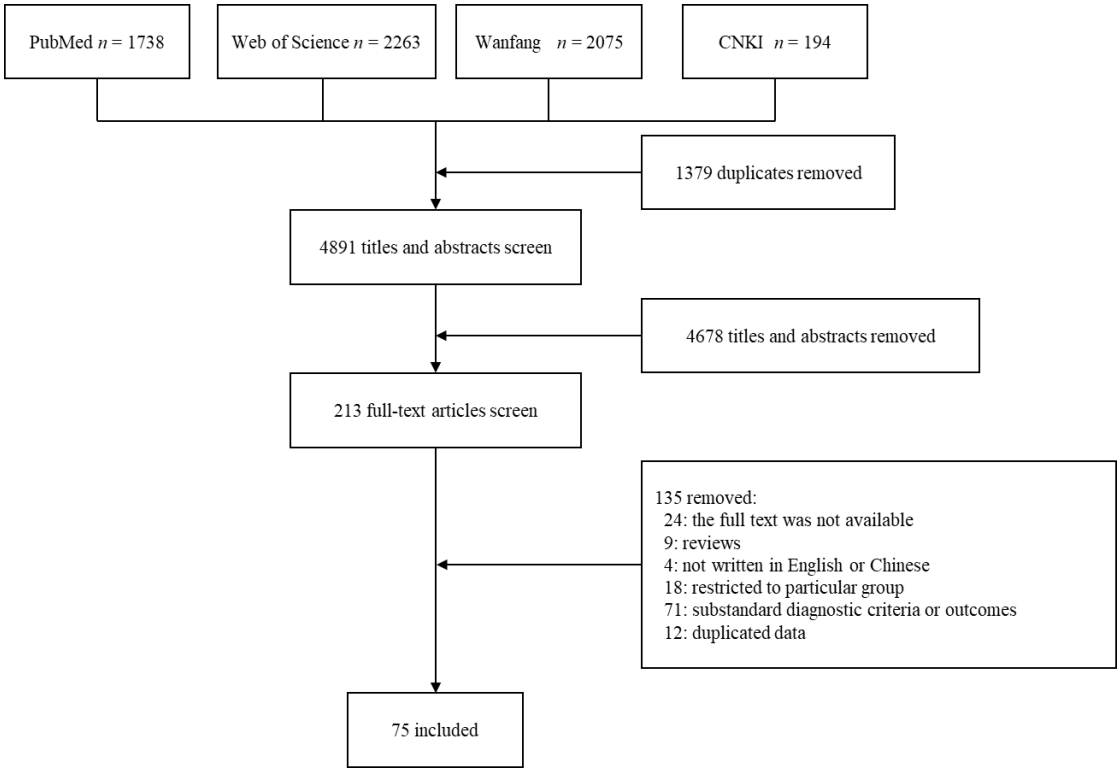
Data including country/region name, first author name, year of publication, study period, study design, age range of the study population, male-female

ratio, age of onset, BMI or BMI z-score, and HOMA index were documented. The male-female ratio was calculated using the reported numbers of cases, or by the prevalence among or incidence rate of the different sexes. An adjusted male-female ratio was calculated by dividing the male-female ratio reported in the study by the male-female ratio of the population, according to the United Nations Department of Economic and Social Affairs[1]. To characterize the association between the male-female ratio of obesity prevalence and T2DM, relevant obesity data were collected[2].

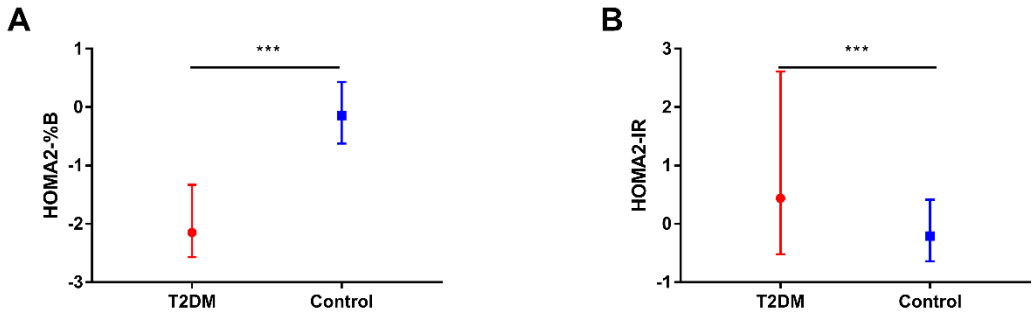
Supplementary Figure 1 Center settings. We established six study centers, which were located in Changchun (the capital of Jilin Province), Harbin (the capital of Heilongjiang Province), Jinan (the capital of Shandong Province), Shanghai (a municipality), Tianjin (a municipality), and Zhengzhou (the capital of Henan Province). These included four tertiary hospitals and two pediatric hospitals that were the largest in their respective provinces or municipalities and provided the best medical service. Due to their culture and health care system, Chinese patients exhibited unique behavior in that they tended to go to the best and largest hospitals. Thus, the above centers provided medical service for most children with diabetes in each respective province and municipality. Furthermore, these provinces and municipalities accounted for over one-fifth of the country's population; data from these centers were therefore generally representative of the population of China.



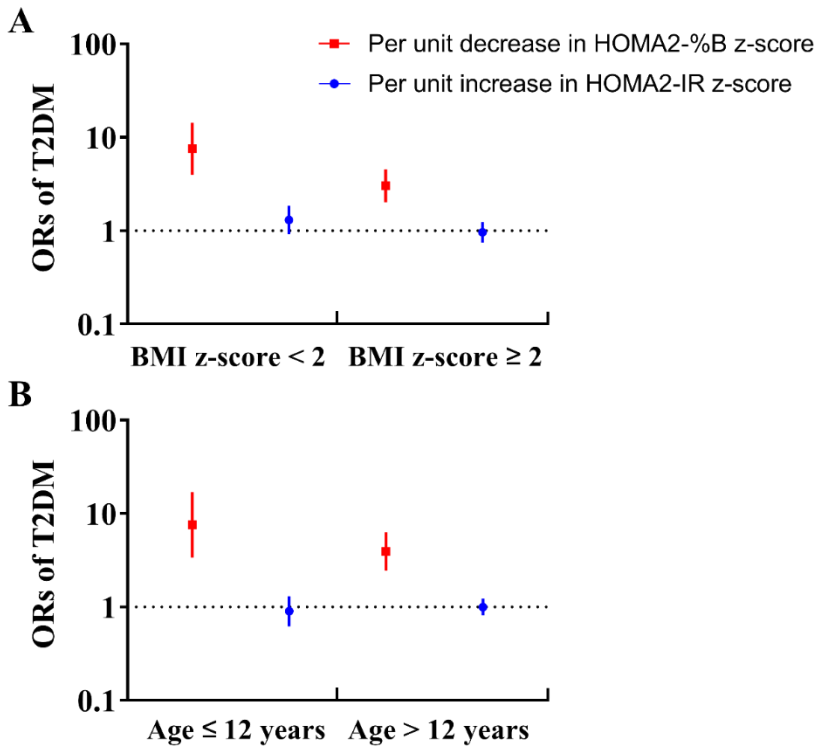
Supplementary Figure 2 Flow chart of the type 2 diabetes mellitus group and the control population. A: Type 2 diabetes mellitus group; B: Control population.



Supplementary Figure 3 Flow chart of the literature review.



Supplemental Figure 4 Differences of homeostasis model assessment of β-cell function and insulin resistance z-score between type 2 diabetes mellitus children and the control population. Data are represented by median (IQR). ***$P < 0.001$. T2DM: Type 2 diabetes mellitus; HOMA2-%B: Homeostasis model assessment of β-cell function; HOMA2-IR: Homeostasis model assessment of insulin resistance.



Supplementary Figure 5 Association between male and risk of type 2 diabetes mellitus by different obesity status and age groups. Error bars indicate 95%CIs. A: Sex, age, T2DM family history, Tanner stage and lipid profile were adjusted for in the models; B: Sex, T2DM family history, Tanner stage, BMI z-score and lipid profile were adjusted for in the models. T2DM: Type 2 diabetes mellitus; HOMA2-%B: Homeostasis model assessment of β-cell function; HOMA2-IR: Homeostasis model assessment of insulin resistance.

Supplementary Table 1 Clinical characteristics of the newly diagnosed type 2 diabetes mellitus patients by sex

	Male (*n* = 93)	**Female (*n* = 68)**	***P* value**
Age, yr	12.5 ± 1.9	12.3 ± 1.7	0.50
BMI z-score	2.08 ± 1.01	2.46 ± 0.81	0.015*
Birth weight, kg	3.52 ± 0.74	3.32 ± 0.46	0.98
Obesity status			
Normal weight	9/88 (10.2%)	10/65 (15.4%)	0.52
Overweight	28/88 (31.8%)	17/65 (26.2%)	0.40
Obesity	51/88 (58.0%)	38/65 (58.5%)	0.88
Status of puberty			
Tanner I	17/55 (30.9%)	7/46 (15.2%)	0.014*
Tanner II	16/55 (29.1%)	10/46 (21.7%)	0.40
Tanner III	13/55 (23.6%)	7/46 (15.2%)	0.29
Tanner IV/V	9/55 (16.4%)	22/46 (47.8%)	0.13
Family history of T2DM	46/92 (50.0%)	29/67 (43.4%)	0.40
Clinical symptom at onset			
DKA	11/93 (11.8%)	7/68 (10.3%)	0.76
Polydipsia	59/93 (63.4%)	39/68 (57.4%)	0.43

Polyuria	59/93 (63.4%)	34/68 (50.0%)	0.088
Weight loss	48/93 (51.6%)	25/68 (36.8%)	0.062
No symptom	22/93 (23.7%)	27/68 (39.7%)	0.029*
Fasting serum glucose (mmol/L)	10.6 (7.1-14.2)	10.9 (6.8-15.6)	0.42
Fasting serum insulin (mIU/L)	13.1 (7.7-29.2)	13.0 (7.4-25.2)	0.70
HbA1c (%)	11.2 (7.6-12.9)	11.7 (9.4-13.0)	0.27
HOMA2-%B	28.2 (15.7-89.1)	35.5 (17.4-87.7)	0.53
HOMA2-IR	2.53 (1.28-4.45)	1.97 (1.20-4.33)	0.62
DI-HOMA	16.7 (7.6-34.5)	18.3 (10.2-31.4)	0.41
Total triglycerides (mmol/L)	1.84 (1.38-2.59)	1.53 (0.95-2.83)	0.14
Total cholesterol (mmol/L)	4.86 (3.99-5.57)	4.64 (3.94-5.39)	0.51
LDL-C (mmol/L)	2.97 (2.43-3.41)	3.06 (2.46-3.50)	0.58
HDL-C (mmol/L)	1.10 (0.98-1.24)	1.08 (0.89-1.32)	0.73
Dyslipidemia	57/76 (75.0%)	47/59 (79.7%)	0.53
Elevated blood pressure	35/62 (56.5%)	24/49 (49.0%)	0.46
Medication			
Metformin	50/88 (56.8%)	47/65 (72.3%)	0.24
Insulin	18/88 (20.5%)	7/65 (10.8%)	0.11

Metformin+Insulin	16/88 (18.2%)	9/65 (13.8%)	0.47
Life style intervention	4/88 (4.5%)	2/65 (3.1%)	0.64

Data were mean (SD), median (IQR), or n (%). P values were derived from χ^2 test, Student's *t* test or Kruskal-Wallis test. T2DM= type 2 diabetes mellitus. BMI = body mass index. DKA = diabetic ketoacidosis. LDL-C = low-density lipoprotein cholesterol. HDL-C= high-density lipoprotein cholesterol. HOMA2-%B = homeostasis model assessment of β-cell function. HOMA2-IR = homeostasis model assessment of insulin resistance. DI-HOMA = disposition index of HOMA index. *$P < 0{\cdot}05$.

Supplementary Table 2 Odd ratio of homeostasis model assessment of β-cell function and insulin resistance z-score for pediatric type 2 diabetes mellitus

	Per unit decrease in the z-score of HOMA2-%B	**Per unit increase in the z-score of HOMA2-IR**
Univariate model		
OR (95% CI)	8.40 (6.40–11.02)	1.79 (1.60–2.02)
P value	< 0.001***	< 0.001***
Multivariable model 1		
OR (95% CI)	5.96 (4.41–8.06)	1.67 (1.44–1.93)
P value	< 0.001***	< 0.001***
Multivariable model 2		
OR (95% CI)	5.11 (3.78–6.93)	1.64 (1.41–1.92)
P value	< 0.001***	< 0.001***
Multivariable model 3		
OR (95% CI)	5.48 (3.78–7.93)	0.96 (0.81–1.14)
P value	< 0.001***	0.636
Multivariable model 4		
OR (95% CI)	4.78 (3.22–7.11)	0.93 (0.77–1.11)

P value	< 0.001***	0.420

Model 1 was adjusted for sex and Tanner stage. Model 2 was adjusted for sex, age, Tanner stage and T2DM family history. Model 3 was adjusted for variables in model 2 and BMI z-score. Model 4 was adjusted for variables in model 3 and lipid profile. ****P* < 0.001.

Supplementary Table 3 Literature review of current studies

First author, years (by region)	Countries/Regions	Study period	Study design	Male-Female ratio	Adjusted male-female ratio#	Average onset ages, years	BMI/BMI z-score	HOMA index
Asia and Oceania								
Liang, 2004[3]	China, Beijing	1993–2002	-Retrospectively review of the medical records from 1 center	0·73	NA	12·9 ± 1·1	27·0 ± 2·2	B 70·2 ± 7·1 IR 4·6 ± 0·9
Shi, 2006[4]	China, Zhejiang	1995–2005	-Retrospectively review of the medical records from 1 center -New-onset diabetes cases in children aged 7–	0·83	NA	14·8 ± 2·2	25·24 ± 5·13	B 71·7 ± 5·1 IR 4·7 ± 1·1

			20 years				
Zhang, 2006[5]	China, Shanghai	2003–2004	-Population based screening among school children aged from 11–19 years	1·45*	1·45	NA	NA	NA
Pan, 2008[6]	China, Zhejiang	2003–2008	-Retrospectively review of the medical records from 1 center	3·00	NA	NA	31·4 ± 2·7	B 195·42 ± 185·65 IR 31·75 ± 21·34
Jin, 2011[7]	China,	2000–2010	-Retrospectively review of the medical records from 1 center -New-onset diabetes cases in	2·44	NA	12·5 ± 1·6	NA	NA

			children aged 3–18 years							
Li, 2011[8]	China, Beijing	2000–2008	-Retrospectively review of the medical records from 1 center -T2DM cases with the onset ages of 13–20 years	2·64	NA	16·0 2·7	±	28·45 5·25	±	NA
Fu, 2013[9]	China	1995–2010	-Retrospectively review of the medical records from 14 centers in 13 cities in China -New-onset diabetes cases in	1·37	1·29	NA		NA		NA

			children aged under 18 years						
Zhao, 2013[10]	China, Liaoning	2003–2012	-Retrospectively review of the medical records from 1 center	0·79	NA	11·8 ± 1·6	25·24 ± 5·13	B 126·61 ± 111·08 IR 9·21 ± 7·81
Che, 2015[11]	China, Liaoning	2010–2014	-Retrospectively review of the medical records from 1 center	1·32	NA	12·4 ± 3·1	28·4 ± 7·3	NA
Wu, 2017[12]	China, Zhejiang	2007–2013	-Data from a prospective population-based diabetes registry system of Zhejiang	1·15	1·08	NA	NA	NA

			Provincial Center for Disease Control and Prevention -New-onset diabetes cases aged 5–19 years							
Qin, 2017[13]	China, Hubei	2012–2016	-Retrospectively review of the medical records from 1 center	1·09	NA	13·23 ± 0·26		26·74 ± 3·15		NA
Qian, 2017[14]	China, Beijing	2010–2016	-Retrospectively review of the medical records from 1 center	1·46	NA	12·7		NA		NA
Huen, 2000[15]	China, Hong Kong	1984–1996	-Retrospective register of all diabetic children	0·29	0·28	NA		NA		NA

			under the age of 15 years in Hong Kong through the review of medical records					
Eppens, 2006[16]	China, Hong Kong	2003	-Cross-sectional, clinic-based survey of multicenter -Patients with type 2 diabetes with a minimum duration of 12 months and age less than 18 years at assessment	1·15	1·19	13·2	NA	NA
Eppens, 2006[16]	China, Taiwan	2003	-Cross-sectional, clinic-based	1·67	1·62	12·6	NA	NA

			survey of multicenter -Patients with type 2 diabetes with a minimum duration of 12 months and age less than 18 years at assessment					
Wei, 2003[17]	China, Taiwan	1999	-Population screening among schoolchildren ages 6–18 years	0·59	0·56	Male 13·7 ± 2·5 Female 13·0±2·5	Male 27·2 ± 5·7 Female 24·5 ± 5·4	NA
Lee, 2015[18]	South Korea, Busan and Gyeongnam	2001–2010	-Retrospectively review of the medical records from 5 tertiary	0·80*	0·80	NA	NA	NA

			and 42 general hospitals in questionnaire form -Newly diagnosed diabetes cases in children under the age of 15 years					
Kim, 2017[19]	South Korea, Jeonbuk	2010–2013	-Population screening among schoolchildren	0·44	0·44	14·6 ± 2·5	25·3 ± 4·9	IR 10·4 ± 10·4
Eppens, 2006[16]	South Korea	2003	-Cross-sectional, clinic-based survey of multicenter -Patients with	0·67	0·66	11·9	NA	NA

			type 2 diabetes with a minimum duration of 12 months and age less than 18 years at assessment					
Urakami，2005[20]	Japan, Tokyo	1974–2002	-Population screening among schoolchildren aged 6–15 years	0·84	0·87	NA	NA	NA
Sugihara, 2005[21]	Japan	2003	-Questionnaire survey among councilors of the Japanese Society for Pediatric Endocrinology (JSPE) and members of the	0·88	0·91	11·9 ± 2·1	NA	NA

			Japanese Study Group of Insulin Therapy for Childhood and Adolescent Diabetes (JSGIT) -Children with type 2 diabetes treated at 42 medical centers throughout Japan					
Eppens, 2006[16]	Japan	2003	-Cross-sectional, clinic-based survey of multicenter -Patients with type 2 diabetes with a minimum	0·74	0·76	12·0	NA	NA

			duration of 12 months and age less than 18 years at assessment					
Eppens, 2006[16]	Indonesia	2003	-Cross-sectional, clinic-based survey of multicenter -Patients with type 2 diabetes with a minimum duration of 12 months and age less than 18 years at assessment	0·75	0·75	10·7	NA	NA
Eppens, 2006[16]	Malaysia	2003	-Cross-sectional, clinic-based survey of	0·53	0·51	11·2	NA	NA

			multicenter -Patients with type 2 diabetes with a minimum duration of 12 months and age less than 18 years at assessment					
Eppens, 2006[16]	Philippine	2003	-Cross-sectional, clinic-based survey of multicenter -Patients with type 2 diabetes with a minimum duration of 12 months and age less than 18 years	0·73	0·72	10·8	NA	NA

			at assessment					
Eppens, 2006[16]	Singapore	2003	-Cross-sectional, clinic-based survey of multicenter -Patients with type 2 diabetes with a minimum duration of 12 months and age less than 18 years at assessment	0·75	0·71	11·7	NA	NA
Eppens, 2006[16]	Thailand	2003	-Cross-sectional, clinic-based survey of multicenter -Patients with type 2 diabetes	1·22	1·24	11·6	NA	NA

			with a minimum duration of 12 months and age less than 18 years at assessment					
Likitmaskul, 2003[22]	Thailand	1997–1999	-Retrospectively review of the medical records from 1 center -New-onset diabetes cases aged under 14 years	1·33	NA	11·6 ± 2·1	27·8 ± 3·2	NA
Trepatchayakorn, 2014[23]	Thailand, Bangkok	2001–2013	-Retrospectively review of the medical records from 1 center	0·72	NA	12·6 ± 2	BMI Z-score 2·7 ± 1·8	NA

			-Diabetes cases who had been regularly followed-up at the center						
Jaruratanasirikul, 2017[24]	Thailand, Songkhla	1995–2014	-Retrospectively review of the medical records from 1 center -Diabetes cases aged under 15 years	1·69	NA	13·0	± 2·5	NA	NA
Ramachandran, 2003[25]	India, Chennai	2002	-Retrospectively review of the medical records from 1 center -Diabetes cases with age at	0·38	0·35	13		NA	NA

			diagnosis under 15 years					
Unnikrishnan, 2008[26]	India	NA	-Cross-sectional study of 7 centers -Diabetes cases with age at diagnosis below 20 years	1·40	NA	16·2 ± 2·9	25·5 ± 5·6	NA
Batson, 2013[27]	India, Trinidad	2009	-Population screening among schoolchildren from primary and secondary schools	0·40	0·37	NA	NA	NA
Punnose, 2005[28]	United Arab Emirates	1999–2001	-Retrospectively review of the medical records from 1 center	0·10	0·05	14·6	30·1	IR 13·6 ± 11·0

			-Diabetes cases aged under 18 years					
Dayan, 2005[29]	Israeli		-Population medical examination of those who were 17-year-old	3·6*	NA	NA	NA	NA
Meyerovitch, 2017[30]	Israeli	2000–2009	-Diabetes cases from a nationwide Clalit Health Services (CHS) database	0·96	0·99	14·3 ± 2·5	BMI z-score Male 2·26 ± 0·84 Female 2·48 ± 0·92	NA
Moussa, 2008[31]	Kuwaiti	2000–2002	-Diabetes cases from 182 schools	1·70*	1·70	14·2 ± 3·0	NA	NA

			randomly selected						
Khalid, 2015[32]	Saudi Arabia	2007–2009	-A nationwide household population based cross-sectional study (SAUDI-DM)	0·89	0·71	12·5 4·0	±	23·9 ± 8·7	NA
Ogle, 2016[33]	Fiji	2001–2012	-Data from the IDF Life for a Child Program (LFAC) from 3 pediatric centers -New cases of pediatric diabetes aged under 15 years	0·18	0·17	12·2 2·7	±	BMI z-score 1·49	NA
Zabeen, 2016[34]	Bangladesh	2011–	-Observational	0·51	0·50	NA		NA	IR 14·8

		2015	cross-sectional study from 1 center -Diabetes cases aged under 18 years					
Lyafei, 2018[35]	Qatar	2006–2016	-Prospective cohort study using the capture-recapture technique	0·71	0·22	NA	NA	NA
Eppens, 2006[16]	Australia	2003	-Cross-sectional, clinic-based survey of multicenters -Patients with type 2 diabetes with a minimum	0·38	0·38	14·1	NA	NA

			duration of 12 months and aged under 18 years at assessment						
Mcmaho, 2004[36]	Western Australia	1990–2002	-Retrospectively review of the medical records from 1 center -Diabetes cases aged under 17 years	0·54	NA	13·6 ± 1·8	BMI z-score 1·94 ± 0·59	NA
Craig, 2007[37]	Australia, New South Wales	2001–2006	-Data from Australasian Paediatric Endocrine Group NSW Diabetes Register, and ascertainning	0·94	0·94	14·5	31·1 BMI z-score 2·2	NA

			from the National Diabetes Register (NDR) and the National Diabetes Supply Scheme (NDSS) -Diabetes cases with age at diagnosis below 18 years					
Ruhayel, 2010[38]	Australia, Melbourne	2001–2006	-Retrospectively review of the medical records from 1 center	0·50	NA	13·4	Male 30·7 Female 3·07 BMI z-score Male	NA

							2·13 Female 1·83	
Hotu, 2004[39]	New Zealand, Auckland	2002	-Retrospectively review of the medical records from 1 center	1·00	NA	15	34·6	NA
Campbell-Stokes, 2005[40]	New Zealand	1999–2000	-Monthly report of diabetes cases from the New Zealand Pediatric Surveillance Unit (NZPSU) -Cases of pediatric diabetes aged under 15 years	0·33	0·34	13·7	32·1	NA
Jefferies, 2012[41]	New Zealand,	1995–	-Retrospectively	0·49	NA	12·9±1·8	33·8	NA

	Auckland	2007	review of the medical records from 1 center				BMI z-score 2·3 ± 0·4	
Natalia, 2018[42]	New Zealand, Auckland	1995–2015	-Retrospective analysis of prospectively collected data from a population-based referral cohort -New cases of diabetes aged below 15 years	0·55	0·57	12·9±1·9	BMI z-score 2·3 ± 0·4	NA
Haliloğlu, 2018[43]	Turkey, Istanbul	1999–2016	-Retrospectively review of the medical records from 1 center -Diabetes cases	0·41	NA	13·2 ± 2·5	BMI z-score 2·3 ± 1·0	NA

				aged below 18 years					
Hatun, 2019[44]	Turkey		2015–2016	-Data retrospectively collected through the registry system of the National Pediatric Endocrinology and Diabetes Association -Diabetes cases aged 6–18 years	0·47	0·48	13·8 ± 2·2	31·3 ± 6·5 BMI z-score 2·4 ± 0·8	NA
Europe						NA			
Feltbower, 2003[45]	United Kingdom, Leeds		2000	-Retrospectively review of the medical records	0·67 (aged under 19 years)	0·71	NA	NA	NA

			from 3 centers -New cases of diabetes aged below 30 years					
Ehtisham, 2004[46]	United Kingdom	2000	-Cross-sectional postal questionnaire survey of all consultants involved in the care of children with diabetes -Diabetes cases aged under 16 years	0·47	0·49	12·75	NA	NA
Haines, 2007[47]	United Kingdom and the Republic of Ireland	2004–2005	-Prospective monthly surveillance of	0·76	0·79	Male 14·1 ± 2·0	BMI z-score Male	NA

			2665 consultant pediatricians and parallel report from diabetes specialist nurses -Diabetes cases aged below 16 years			Female 13·3 ± 1·7		Female 2·45 3·04	
Khanolkar, 2019[48]	England and Wales	2009–2010 to 2015–2016	-Data retrospectively collected through the National Pediatric Diabetes Audit (NPDA) for England and Wales which reached 100%	0·49	0·51	13·4 ± 2·3		BMI z-score 2·6 ± 1	NA

			participation covering all 178 pediatric diabetes clinics -Diabetes cases with age at diagnosis below 19 years					
Candler, 2018[49]	United Kingdom and the Republic of Ireland	2015–2016	-Prospective monthly surveillance of > 3400 consultant pediatricians in the UK and Republic of Ireland using the British Pediatric Surveillance Unit	0·49	0·51	14·3 Male 14·5 Female 14·2	BMI z-score 2·89 Male 2·92 Female 2·88	NA

			(BPSU) -New cases of pediatric diabetes aged under 17 years					
O'Dea, 2017[50]	The Republic of Ireland	2015	-Cross-sectional survey of 19 centers -Diabetes cases with age at diagnosis below 16 years	0·33	0·34	12·5	BMI z-score 2·13	NA
Rami, 2003[51]	Austria	1999–2001	-Data from the registry network covering all pediatric hospitals, wards and	0·14	0·15	13	28·9	NA

			dialectologists -New cases of pediatric diabetes aged under 15 years					
Schober, 2009[52]	Austria	1999–2007	-Data from the registry network covering all pediatric hospitals, wards and dialectologists -New cases of pediatric diabetes aged under 15 years	0·62	0·66	12·3	NA	NA
Lammi, 2007[53]	Finland	1992–1996	-Data from four data sources:	0·67* (aged 15–19 years)	0·67	NA	NA	NA

			standardized reports from diabetes nurses, the Finnish National Hospital Discharge Register, the Drug Reimbursement Register and the Drug Prescription Register -Diabetes cases aged 15–39 years					
Thunander, 2008[54]	Sweden, Kronoberg	1998–2001	-Registration of newly diagnosed	0·94* (aged under 19	0·94	NA	NA	NA

			diabetes	years)				
Neu, 2009[55]	Germany, Baden-Württemberg	2004–2005	-Cross-sectional postal questionnaire survey of the institutions belonging to the DIARY (Diabetes Registry) network include every hospital for children (n = 31) and one diabetes center, dialectologists in private practice (n = 122), internal medicine units (n	0·55	0·57	15·8	NA	NA

			= 164) and other institutions -Diabetes cases aged under 20 years					
Oester, 2015[56]	Denmark	2014	-Data from the Danish Registry for Diabetes in children and adolescent (DanDiabKids) -Diabetes cases aged below 16 years	0·75	0·76	11·3	BMI z-score 3·04	
Pacaud, 2016[57]	Europe, SWEET (Better control in Pediatric and Adolescent	2006–2016	-Data from SWEET included 48 participating centers	0·67	NA	13·8	BMI z-score 2·5	NA

	diabeteS: Working to crEate CEnTers of Reference)		-Diabetes cases aged under 20 years					
Klingensmith, 2018[58]	Europe, Germany, Luxemburg and Austrian	2003–2015	-Data from a prospective, longitudinal, standardized, computer-based documentation system (DPV) -Diabetes cases with onset age of 10–18 years and with current age below 20 years	0·54	NA	13	BMI z-score 2·74	NA
Americas								
Grinstein, 2003[59]	United States	1990–2000	-Retrospectively review of the	0·60	NA	14·0 ± 2·3	34·7 ± 9·0	NA

			medical records from 1 center -Diabetes cases aged under 18 years							
Nadeau, 2005[60]	United States	1996–2002	-Retrospectively review of the medical records from 1 center -Diabetes cases aged under 17 years	0·51	NA	15·4 0·4	±	33 ± 2	NA	
Lipton, 2005[61]	United States, Chicago	1985–2001	-Retrospectively review of the medical records from 37 centers (Chicago Childhood	0·68	0·71	13·6 2·9	±	NA	NA	

			Diabetes Registry) -Diabetes cases aged under 17 years					
Hale, 2006[62]	United States, south Texas	1990–1998	-Retrospectively review of the medical records from 1 center and primary care providers -Diabetes cases aged under 18 years	0·51	NA	NA	NA	NA
Lipman, 2013[63]	United States, Philadelphia	2002–2003	-Population-based registries of diabetes among school children	0·50	0·51	11·9 ± 0·5	NA	NA

			age 4–18 years							
Mayer-Davis, 2009[64]	United States, SEARCH (The SEARCH for Diabetes in Youth Study)	2003–2012	-Population-based observational study in 6 centers -Diabetes cases aged below 20 years	0·58–0·81*	0·58–0·81	NA		NA		NA
Copeland, 2011[65]	United States, TODAY (The Treatment Options for Type 2 Diabetes in Adolescents and Youth)	2004–2009	-Cohort recruiting from 15 centers -Diabetes cases aged 10–17 years	0·54	0·55	14·0	±	2·15	±	NA
						2·0		0·44		
Klingensmith, 2016[66]	United States, PDC (Pediatric Diabetes Consortium)	2012–2014	-Data from 19 pediatric diabetes centers (PDC) -Diabetes cases with onset age	0·54	0·55	13·1	±	BMI z-score		NA
						2·3		2·3		

			under 18 years and with age under 21 years at the time of enrollment					
Klingensmith, 2018[58]	United States, PDC (Pediatric Diabetes Consortium)	2003–2015	-Data from 19 pediatric diabetes centers (PDC) -Diabetes cases with onset age of 10–18 years and with current age under 20 years	0·59	0·60	12	BMI z-score 3·07	NA
Washington, 2013[67]	United States, Virgin Islands	2001–2010	-Population-based retrospective review of the medical records -Diabetes cases	0·57*	0·57	NA	NA	NA

			aged under 19 years					
Chen, 2019[68]	United States	2002–2016	-Data from the MarketScan Multi-State Medicaid Database -Diabetes cases aged under 18 years	0·53	0·54	NA	NA	NA
Zdravkovic, 2004[69]	Canada, Toronto	1994–2002	-Retrospectively review of the medical records from 1 center -Diabetes cases with onset age under 18 years	0·58	NA	13·5 ± 2·2	29·8 ± 8·9 BMI z-score 2·38 ± 1·61	NA
Amed, 2010[70]	Canada	2006–	-Prospective	0·72	0·73	13·7 ±	32·1 ± 7·2	NA

		2008	national surveillance study involved a network of pediatricians, pediatric endocrinologists, family physicians, and adult endocrinologists -Diabetes cases aged under 18 years			2·5	BMI z-score 2·08 ± 0·6	
Emily, 2010[71]	Canada, Montreal	2001–2005	-Retrospectively review of the medical records from 1 center	0·57	NA	NA	NA	NA

Sellers, 2012[72]	Canada, Manitoba and northwestern Ontario	2006–2011	-Retrospectively review of the medical records from 1 center -Diabetes cases with onset age under 18 years	0·58	NA	13·2 ± 2·3	BMI z-score 2·03 ± 0·67	NA
Amed, 2017[73]	Canada	2012–2013	-Population-based cohort study according to 4 national database -Diabetes cases aged under 20 years	0·97*	0·97	NA	NA	NA
Cruz, 2004[74]	Mexico, Mexico City	NA	-Retrospectively review of the medical records from 1 center	0·83	NA	13·8±1·7 5 Male 13·9 ±	27·8±4·4	IR 12·0±6·9

			-Diabetes cases aged 8–16 years			1·6 Female 13·8 ± 1·9		
Guerrero-Romero, 2009[75]	Mexico	NA	-Cross-sectional study of children age 6–18 years randomly selected from elementary and middle schools	3·50	NA	12·2 ± 2·2	32·1 ± 6·6	NA
Zvarova, 2013[76]	Mexico, Quintana Roo	2006–2010	-Cross-sectional population based study among the general public	1·31* (aged below 20 years)	1·31	NA	NA	NA
Africa								
Osman, 2013[77]	Sudan, Khartoum	2006–2009	-Retrospectively review of the	0·85	0·84	NA	NA	NA

										medical records from 1 center

*The male-female ratio was calculated from the incidence or prevalence rate of T2DM according to the articles, thus it didn't adjust by the population male-female ratio. #Adjusted male-female ratio was calculated by dividing the male-female ratio according to the article by the male-female ratio of the population according to the United Nations Department of economic and social affairs (https://population.un.org/wpp/Download/Standard/Population/). NA = not applicable. BMI = body mass index. HOMA= homeostasis model assessment.

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