Appendix 3. Characteristics of included studies

Table 1. Characteristics of included studies that didn't use in data pooling (quality assessment score/ risk of bias score)

	First author	*Year*	*Language*	*Sample size*	*n Athletes*	*Age*	*Gender*	*Sports fields*	*Sports activity levels*	*Assessment method*	*Quality score*	*Risk of bias*
1	**Becker**	1986	English	336	336	Adolescent	F& M*	Swimming	Competitive	Adam's test**	5	1
2	**Hamilton**	1992	English	28	28	Adult	F& M	Ballet dance	Competitive	Adam's test	5	3
3	**Ogon**	2001	English	120	120	Adolescent & adult	F& M	Ski	Competitive	X-ray (thoracolumbar and lumbar spine)	5	2
4	**Vařeková**	2011	English	62	62	Adult	F	Volleyball	Competitive	Adam's test	5	3
5	**Zaina**	2014	English	329	112	Adolescent	F& M	Swimming	Competitive	Scoliometer	6	3
6	**Ramos-Álvarez**	2016	English	102	102	Adolescent	F& M	Swimming, fencing and badminton	Competitive	X-ray	6	2
7	**Langdon**	2016	English	207	207	Adolescent & adult	M	Rugby	Recreational & competitive	Posture Analysis (WMPA)	5	4
8	**Lotfian**	2017	English	244	244		M	Football	Competitive	Spinal mouse	5	4
9	**Snodgrass**	2021	English	263	263	Adolescent	M	Football	Competitive	Photograph, modified Watson and Mac Donncha scale	5	4

*F=Female, M=Male **researchers just used this test without using scoliometer.

Table 2. Characteristics of studies included in data pooling (quality assessment score/ risk of bias score)

	First author	*Year*	*Language*	*Sample size*	*n Athletes*	*Age*	*Gender*	*Sports fields*	*Sports activity levels*	*Assessment method*	*Quality score*	*Risk of bias*
1	**Warren**	1986	English	75	75	Adult	F	Ballet dance	Recreational	X-ray	7	3
2	**Hellström**	1990	English	173	143	Adolescent & adult	F&M	Wrestlers (30), Gymnasts (F:26/M:26), Male athletes pooled (117), Tennis (30), Soccer (31)	Elit	X-ray, lower half of the thoracic and lumbar and half of sacrum	7	0
3	**Campos 1**	1997	English	371	371	Adolescent	F&M	27 different types	Elit	X-ray	7	2
4	**Campos 2**	1997	English	70	70	Adolescent	F&M	Basketball	Elit	X-ray	7	2
5	**Tanchev**	2000	English	4900	100	Adolescent	F	Gymnastic	Recreational	X-ray	8	2
6	**Heitkamp**	2005	German	41	41	Child & adolescent	F	Gymnastic	Recreational	X-ray	6	4
7	**Modi**	2008	English	46544	116	Adolescent	F&M	Volleyball	Recreational	X-ray	8	2
8	**Trexler**	2013	English	15	15	Adult	F	Gymnastic	Competitive	X-ray	6	2
9	**Steinberg**	2013	English	1288	1288	Child & adolescent	F	Ballet dance	Recreational	Adam's test*	7	3
10	**Longworth**	2014	English	60	30	Adolescent	F	Ballet dance	Recreational	Scoliometer	6	4
11	**Zaina**	2016	English	305	102	Adolescent	F&M	Tennis	Competitive	Scoliometer	7	2
12	**Watanabe 1**	2017	English	944	944	Adolescent	F	Swimming	Recreational	X-ray	9	2
13	**Watanabe 2**	2017	English	117	117	Adolescent	F	Rhythmic gymnastics	Recreational	X-ray	9	2
14	**Watanabe 3**	2017	English	344	344	Adolescent	F	Classical ballet	Recreational	X-ray	9	2
15	**Watanabe 4**	2017	English	320	320	Adolescent	F	Dancing	Recreational	X-ray	9	2
16	**Watanabe 5**	2017	English	93	93	Adolescent	F	Artistic gymnastic	Recreational	X-ray	9	2
17	**Watanabe 6**	2017	English	340	340	Adolescent	F	Tennis	Recreational	X-ray	9	2
18	**Watanabe 7**	2017	English	217	217	Adolescent	F	Basketball	Recreational	X-ray	9	2
19	**Watanabe 8**	2017	English	229	229	Adolescent	F	Badminton	Recreational	X-ray	9	2
20	**Watanabe 9**	2017	English	213	213	Adolescent	F	Volleyball	Recreational	X-ray	9	2
21	**Aydin**	2020	English	679	679	Adult	F&M	Swimming	Competitive	X-ray	6	3
22	**Steinberg**	2021	English	132	132	Adolescent	F	Dance	Recreational	Adam's test	6	4

*Adam's test= researchers just used this test without using scoliometer

Table 3. Characteristics of included studies (IS* prevalence/sample size)

	First author	*Year*	*Country*	*Sample*	*n Athletes*	*n Control*	*IS* prevalence in athletes*	*IS prevalence in control*
1	**Becker**	1986	USA	336	336	-	16% Mild Functional, structural idiopathic 6/9%	-
2	**Hamilton**	1992	USA	28	28	-	50% of the women and 27% of the male	-
3	**Ogon**	2001	Austria	120	120	-	24 (20%) mild scoliosis	-
4	**Vařeková**	2011	Czech	62	62	-	2 (3.2%)	-
5	**Zaina**	2014	Italy	329	112	217	Odds ratio: 1.86	Not reported
6	**Ramos-Álvarez**	2016	Spain	102**	102	54**	2 (8%), a left-thoracic curve, 18º and 20º Cobb for both cases.	-
7	**Langdon**	2016	Australia	207	207	-	S-Scoliosis, Moderate deviation: (8.2) and Marked deviation: (0.5)-C-Scoliosis, Moderate deviation: (23.7) and Marked deviation: (0.0).	-
8	**Lotfian**	2017	Iran	244	244	-	Players with scoliosis 3 (1.2%)	-
9	**Snodgrass**	2021	Australia	263	263	-	17 (6.5%), Odd ratio: 0.76	-
10	**Warren**	1986	USA	75	75	-	18 (24%)	-
11	**Hellström**	1990	Sweden	173	143	30 Males	29 (20.27%)	Not reported
12	**Campos 1**	1997	Spain	371	371	-	44 (11.85%.)	-
13	**Campos 2**	1997	Spain	70	70	-	(27.27%)	-
14	**Tanchev**	2000	Bulgaria	4900	100	4800	12 (12%)	53 (1.1%)
15	**Heitkamp**	2005	Germany	41	41	-	2 (4.8%)	-
16	**Modi**	2008	South Korea	46544	116	46428	6 (5.2%). Cobb Me=12°, Range: 10-15. Odds ratio:6.1	465(1%). Cobb Me: 24.5°, Range: 10-55
17	**Trexler**	2013	USA	15	15	-	3 (20%)	-
18	**Steinberg**	2013	Israel	1288	1288	-	307(23.8%)	-
19	**Longworth**	2014	Australia	60	30	30	9 (30%)	1 (3.33%)
20	**Zaina**	2016	Italy	305	102	203	6 (0.05%)	12 (0.05%)
21	**Watanabe 1**	2017	Japan	944	944	-	469 (49.7%), Odds ratio: 1.10	-
22	**Watanabe 2**	2017	Japan	117	117	-	56 (47.9%), Odds ratio: 1.04	-
23	**Watanabe 3**	2017	Japan	344	344	-	192 (55.8%), Odds ratio: 1.38	-
24	**Watanabe 4**	2017	Japan	320	320	-	156 (48.8%), Odds ratio: 1.04	-
25	**Watanabe 5**	2017	Japan	93	93	-	49 (52.7%), Odds ratio 1.19	-
26	**Watanabe 6**	2017	Japan	340	340	-	154 (45.3%), Odds ratio: 0.88	-
27	**Watanabe 7**	2017	Japan	217	217	-	83 (38.3%), Odds ratio: 0.69	-
28	**Watanabe 8**	2017	Japan	229	229	-	82 (35.8%), Odds ratio: 0.61	-
29	**Watanabe 9**	2017	Japan	213	213	-	89 (41.8%), Odds ratio: 0.76	-
30	**Aydin**	2020	Turkey	679	679	-	28 (4.1%)	-
31	**Steinberg**	2021	Israel	132	132	-	38 (28.8%)	-

*Idiopathic scoliosis, **Asymmetrical: fencing, badminton=48, symmetrical: swimming=54 that considered control group.