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NEW ASPECTS CONCERNING *PEDICULUS CAPITIS* (ANOPLURA: PEDICULLIDAE) INFESTATION IN IRAN

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Pediculosis caused by the *Pediculus capitis* (De Geer, 1767), is a major public health concern worldwide, including in Iran. Policymakers must be well-informed on the relevant evidence through comprehensive studies. No study has been done concerning trends of *Pediculus capitis* infestation in provinces of Iran, geographic and climatic regions, seasons, location of meridians and tropics areas, together with the distribution and stratification. Therefore, a study of the mentioned objectives was conducted. The data on *P. capitis* infestation levels and factor impacts on *P. capitis* infestation levels in Iranian people were extracted and summarized from 126 articles. The trends of *P. capitis* infestation have increased in about half of the country's provinces over the previous two decades. These provinces are located mostly in the southern Caspian Sea shores, the central plateau, and the south coast. *Pediculus capitis* infestations are in the range of $-\infty$ –0.40, -0.40–0.20, and -0.20–0.00 in the regression coefficient regarding the distribution and stratification. For the first time in this study, the impact of the meridians and the tropics that pass through Iran was also evaluated on *P. capitis* infestation. Based on the intensity of *P. capitis* infestation, the order of the influence of the factors that affect infestation is estimated. Interaction modeling demonstrated that primary school has a synergistic impact on time trends. In addition, the Western mountains, the central plateau, and the southeast showed synergistic effects with time trends on the incidence of the outcome. The findings provide the national baseline data to initiate steps for national pediculosis intervention programs.

Keywords: *Pediculus capitis*, climatic regions, distribution, infestation trend, meridians, stratification, tropics

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Pediculosis is a major public health concern in many countries, especially among overcrowded and lower-income children. *Pediculus capitis* (De Geer, 1767), commonly known as the head lice, is an obligate human ectoparasite and can be found in various parts of the world, including Iran. Head lice infestations can occur in any place where there is close contact between individuals, such as schools, households, or communities. Head lice infest millions of children worldwide. Insects live in the immediate scalp vicinity of individual hair follicles, piercing the skin to feed on blood (Awaad et al., 2023; Feldmeier, 2023; Kassiri, Mehraghaci, 2021; Nasirian, 2023b; Nasirian, Ahmadi, 2024; Nawab et al.,

2024; Valero et al., 2024). Epidemiological interpretations of head lice infestation rates and how factors including age, sex, family size, parent education level, and economic status influenced infestations were explored (Alarifi et al., 2022; Gholami et al., 2024; Nasirian, 2023b; Valero et al., 2024).

Several articles in the scientific literature have estimated infestation rates and the impact of factors affecting the head lice infestation in several regions of Iran, mostly focusing on a single study. Policymakers must be well-informed of the relevant evidence on time through comprehensive studies. This kind of study increases the ability, accuracy, and power of research outcomes for policymakers to provide documents that individual studies cannot provide to health system decision-makers (Nasirian, 2023b; Oliveira et al., 2021; Shanavaz et al., 2023). *Pediculus capitis* infestation and the impact of factors affecting infestation of school students and the community have recently been monitored on a global scale (Nasirian, 2023b; Nasirian and Ahmadi, 2024). However, so far, no study has been done that deals with the trends of *P. capitis* infestation in Iran's provinces, geographic and climatic regions, seasons and in the meridians 50°E, 55°E and 60°E and the tropics at 30°N and 35°N, along with the distribution and stratification of the *P. capitis* infestation in Iran and statistical analysis including a comparison of factor impact on *P. capitis* infestation level and interaction modeling with Poisson regression at the same time. The findings may provide the national baseline data to initiate steps for national pediculosis intervention programs, which is important for this country and can establish a model for monitoring and controlling head lice in schools. Therefore, a study was designed and conducted with the mentioned objectives.

MATERIALS AND METHODS

Collection and selection of papers for review

In order to conduct and design this study, the methods and research patterns of the following resources were exploited, including Ahmadi et al., 2024; Kassiri, Nasirian, 2021; Nasirian, 2017a, b; Nasirian, 2019a; Nasirian, 2019b; Nasirian, 2020, 2022, 2023a, c, 2024a, b; Nasirian and Salehzadeh, 2019; Nasirian et al., 2023; Nasirian, Zahirnia, 2021; and Zahirnia et al., 2023. Among the articles cited in Nasirian (2023) and Nasirian, Ahmadi (2024), those that were dedicated to *P. capitis* infestation and factors affecting *P. capitis* infestation in students of preschools and primary schools, and the community in Iran were chosen. These articles were collected from well-known indexing services, including Elsevier, Entomological Society of America publications, Google Scholar, PubMed, ScienceDirect, Scopus, Springer, and Web of Science (Nasirian, 2023b; Nasirian, Ahmadi, 2024). By researching, the new research that was done was also added to the resources. In the next step, if new information details are needed, they add to them according to data sources and grouped under specific titles in Tables 1–8.

Summary of the study approach

Based on a literature search, the data and variables about *P. capitis* infestation in students of preschools and primary schools (extracted from 106 articles) are summarized in Table 1. The data and variables about *P. capitis* infestation in the age groups of primary school students (extracted from 55 articles) are summarized in Table 2. The data and variables about *P. capitis* infestation in the community (extracted from 17 articles) are summarized in Table 3. The data and variables about *P. capitis* infestation in the age groups of the community (extracted from 12 articles) are summarized in Table 4. The data and variables about the impact of family size on *P. capitis* infestation level in students of primary schools (extracted from 28 articles) are summarized in Table 5. The data and variables about the impact of father's and mother's education, and bathing and hair washing frequency on *P. capitis* infestation level of primary school students (extracted from 49 articles) are summarized in Table 6.

Table 1. *Pediculus capitis* infestation in students of preschools and primary schools, based on a literature search

Counties	Provinces	E			I			I (%)			Sampling				References		
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection
Preschools																	
Rasht	Gilan	913	867	1780	38	54	92	41.0	59.0	5.1	29	1780	Both	Local	1998–1999	Overall	Gholchaye, Ahmadi Ghajari, 2000*
Across	Iran	–	–	–	351	4389	4740	2.5	2.2	2.2	–	213450	Both	Across	2005	Overall	Amirkhani et al., 2011*
Kashan	Isfahan	585	615	1200	1	7	8	0.17	1.1	0.7	–	1200	Both	Local	Feb 2009	Overall	Dehghani et al., 2012*
Urmia	West Azerbaijan	–	–	38	–	–	3	–	–	7.9	35	2040	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012*
Asadabad	Hamadan	–	–	2355	–	–	52	–	–	2.2	–	16438	Both	Local	Oct 2015–Jun 2016	Overall	Nazari et al., 2016*
Sari	Mazandaran	123	293	416	8	19	27	6.5	6.5	6.5	10	416	Both	Local	2014	Randomly	Jahandideh et al., 2017*
Mashhad	Razavi Khorasan	–	–	–	–	–	575	–	–	15.5	–	–	Both	Local	Oct–Dec 2017	Overall	Jarahi et al., 2017*
Primary schools																	
Kashan	Isfahan	1986	–	–	17	–	–	0.86	–	–	8	1986	Boys	Local	1997	Randomly	Dehghani et al., 1999*
Sari	Mazandaran	6097	4894	10991	32	183	215	0.52	3.7	1.9	58	10991	Both	Local	1997–1998	Randomly	Motevali Haghi et al., 1999*
Bushehr	Bushehr	3913	1962	1951	–	–	469	2.0	22.0	12.0	–	1951	Both	Local	1999–2000	Randomly	Arjomanzadeh et al., 2001*
Ilam	Ilam	320	338	658	14	22	36	4.5	6.5	5.5	6	658	Both	Local	Mar 97–Apr 98	Randomly	Gholamiparizad, Abedzadah, 2001*
Yasuj	Kohgiluyeh and Boyer-Ahmad	6438	5809	12247	85	1266	1351	1.3	21.8	11.0	64	2567	Both	Local	Nov–Dec 1999	Overall	Shahraki et al., 2001*
Shahrriar	Tehran	–	–	1921	–	–	–	8.2	24.3	15.8	–	1921	Both	Local	Oct–Mar 1993	Overall	Bashiri et al., 2002*
Bandar Abbas	Hormozgan	–	–	3249	–	–	–	1.8	20.3	12.3	–	3249	Both	Local	1999–2000	Randomly	Soleimani Zadeh, Sharifi Sarasiabi, 2002*

Table 1. *Continuation*

Counties	Provinces	E			I			I (%)			Sampling					References	
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date		Selection
Iranshahr	Sistan and Baluchestan	–	918	–	–	918	–	–	27.0	–	12	918	Girls	Local	Nov 2002–May 2003	Randomly	Alenpour Salemi et al., 2003*
	Qom	–	1650	–	–	74	–	–	4.5	–	–	–	Girls	Local	–	Randomly	Farzinia et al., 2004*
Sanandaj	Kurdistan	–	–	1195	–	–	235	–	–	19.7	18	1195	Girls	Local	–	Randomly	Davari, Yaghmaei, 2005*
Ardabil	Ardabil	–	417	–	–	119	–	–	28.5	–	–	417	Girls	Local	Oct 2001–May 2002	Randomly	Edalatkhah et al., 2005*
Kerman	Kerman	564	636	1200	2	43	45	0.35	6.8	3.8	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005*
Rasht	Gilan	1493	1400	2893	49	80	129	3.3	5.7	4.5	–	2893	Both	Local	2002–2003	Randomly	Pourbaba et al., 2005*
Babol	Mazandaran	–	–	2300	–	–	51	0.96	3.5	2.2	9	–	–	Local	2003–2004	Randomly	Zabihi et al., 2005*
Hamadan	Hamadan	–	7219	–	–	975	–	–	13.5	–	120	975	Girls	Local	2000–2001	Randomly	Zahirnia et al., 2005*
Gorgan	Golestan	–	200	–	–	–	–	–	10.8	–	–	–	–	Local	–	Overall	Borghei, Gharaje, 2006*
Hamadan	Hamadan	440	407	847	3	55	58	0.7	13.5	6.9	12	847	Both	Local	–	Overall	Nazari et al., 2006*
	Amlash	2115	2129	4244	100	292	392	4.7	13.7	9.2	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006*
Zabol	Sistan and Baluchestan	–	1066	–	–	313	–	–	29.4	–	32	–	Girls	Local	2003	Randomly	Zareban et al., 2006*
Qeshm	Hormozgan	269	246	515	96	27	123	35.7	11.0	23.9	–	–	Both	Local	–	Randomly	Soleimani–Ahmadi, 2007*
Sanandaj	Kurdistan	–	600	–	–	46	–	–	7.7	–	–	600	Girls	Local	2005	Randomly	Yaghmaei et al., 2007*
Tabriz	East Azerbaijan	847	1948	2795	0	102	102	0	5.2	3.6	13	2795	Both	Local	Jul–Nov 2006	Overall	Hodjati et al., 2008*
Kerman	Kerman	19774	20812	40586	118	603	721	0.6	2.9	1.8	198	40586	Both	Local	Mar–Jun 2006	Overall	Motavali–Emami et al., 2008*
Bahar	Hamadan	450	450	900	2	10	12	0.44	2.2	1.3	18	900	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009*

Ahvaz	Khuzestan	–	810	–	–	–	–	–	11.0	–	–	810	Girls	Local	Apr–Jun 2006	Randomly	Rafie et al., 2009*
Birjand	South Khorasan	1531	1515	3046	16	75	91	1.0	5.0	3.0	–	500	Both	Local	Jan–Mar 2001	Randomly	Ghaderi et al., 2010*
Khajeh	East Azerbaijan	200	300	500	4	20	24	2.0	6.7	4.8	20	213450	Both	Local	2008–2009	Randomly	Shayeghi et al., 2010*
Across	Iran	–	–	–	9338	122715	132053	65.2	61.7	61.9	–	213450	Both	Across	2005	Overall	Amirkhani et al., 2011*
Amlash	Gilan	45	102	147	2	14	16	4.4	13.7	10.9	–	147	Both	Local	–	Randomly	Rafinejad et al., 2011*
Urmia	West Azerbaijan	866	1174	2040	16	65	81	1.8	5.5	4.0	35	2040	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012*
Bahar	Hamadan	–	–	8568	–	–	701	–	–	8.2	–	17722	Both	Local	Oct–Dec 2011	Overall	Moradi et al., 2012*
Qom	Qom	–	1725	–	–	131	–	–	7.6	–	–	–	–	Local	2010	Randomly	Saghafipour et al., 2012*
Sanandaj	Kurdistan	–	810	–	–	38	–	–	4.7	–	27	810	Girls	Local	–	Randomly	Vahabi et al., 2012*
Sirjan	Kerman	30	65	95	0	16	16	0	24.6	16.8	–	22	Both	Local	2010–2011	Overall	Yousefi et al., 2012*
Robot Karim	Tehran	10000	–	–	–	125	–	–	1.3	–	–	10000	Girls	Local	2008–2009	Randomly	Afshari et al., 2013*
Javanrud	Kermanshah	–	865	–	–	72	–	–	8.3	–	–	865	Girls	Local	2011	Randomly	Geravandi et al., 2013*
Chabahar	Sistan and Baluchestan	–	153	–	–	116	–	–	75.8	–	2	153	Girls	Local	2008–2009	Randomly	Gholammia Shirvani et al., 2013*
Qom	Qom	–	900	–	–	120	–	–	13.3	–	45	900	Girls	Local	2011	Overall	Noroozi et al., 2013*
Ravansar	Kermanshah	–	385	–	–	61	–	–	15.8	–	6	385	Girls	Local	–	Overall	Sayyadi et al., 2013*
Paveh	Kermanshah	–	750	–	–	60	–	–	8.0	–	25	750	Girls	Local	2009–2010	Randomly	Vahabi et al., 2013*
Aran va Bidgol	Isfahan	2096	1493	3589	2	15	17	0.05	0.42	0.47	19	3589	Both	Local	Oct–Dec 2008	Randomly	Doroodgar et al., 2014a*
Kashan	Isfahan	1077	1074	2151	6	8	14	0.6	0.75	0.7	23	624	Both	Local	Nov 2012–May 2013	Randomly	Doroodgar et al., 2014b*
Maneh–Semelghan	North Khorasan	120	130	250	–	–	–	4.2	15.4	10.0	–	250	Both	Local	2013	Randomly	Hosseini et al., 2014*

Table 1. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection
Damghan	Semnan	–	2700	–	–	97	–	–	3.6	–	–	2700	Girls	Local	2008	Overall	Mohammadi Azni, 2014*
Azadshahr	Golestan	–	1510	–	–	55	–	–	3.6	–	–	1510	Girls	Local	2012–2013	Overall	Motevalli Haghi et al., 2014a*
Sari	Mazandaran	645	4067	4712	9	69	78	1.4	1.7	1.7	–	4712	Both	Local	2012–2013	Randomly	Motevalli Haghi et al., 2014b*
Kalaleh	Golestan	–	–	2500	10	147	157	1.8	10.1	6.3	–	2500	Both	Local	Oct 2013–Jun 2014	Randomly	Noori et al., 2014*
Abadan	Khuzestan	302	322	624	0	27	27	0	8.4	4.3	26	104	Both	Local	2012	Randomly	Salehi et al., 2014*
Bayangan	Kermanshah	164	220	384	14	40	54	8.5	18.2	14.1	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014*
Pakdasht	Tehran	28242	25490	53732	122	556	678	0.43	2.2	1.3	–	53732	Both	Local	Oct–Dec 2013	Overall	Davari et al., 2015*
Sarab	East Azerbaijan	138	490	628	–	–	–	2.8	6.6	5.9	40	661	Both	Local	Aug 2013–Mar 2014	Randomly	Dehghanzadeh et al., 2015*
Bonab	East Azerbaijan	–	3757	–	–	106	–	–	2.8	–	–	3757	Girls	Local	2013–2014	Overall	Kabiri et al., 2015*
Bojnurd	North Khorasan	722	753	1475	21	93	114	2.9	12.4	7.7	75	1475	Both	Local	Jan–Mar 2013	Randomly	Rajabzade et al., 2015*
Shahrriar	Tehran	–	750	–	–	36	–	–	4.8	–	3	–	–	Local	2012–2103	Randomly	Alborzi et al., 2016*
Savojbolagh	Alborz	3847	8935	12782	11	227	238	0.29	2.5	1.9	–	2744	Both	Local	Sep–Dec 2013	Overall	Bahrani et al., 2016*
BandarAbbas	Hormozgan	116	100	216	–	–	45	6.0	33.3	20.8	–	216	Both	Local	2014	Overall	Hosseinpour et al., 2016*
Galugah	Mazandaran	132	168	300	9	8	17	6.8	4.8	5.7	16	300	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016*
Khorramshahr	Khuzestan	405	345	750	–	–	15	1.5	2.6	2.0	10	750	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016*
Hashtgerd	Alborz	185	187	372	1	16	17	0.54	8.6	4.6	6	372	Both	Local	Oct 2012–Jun 2013	Randomly	Morowati Sharifiabad et al., 2016*

Kalaleh	Golestan	265	276	541	5	30	35	1.9	10.9	6.5	4	3757	Girls	Local	Oct-Dec 2015	Randomly	Maleky et al., 2016*
Lar	Fars	—	2084	—	—	82	—	—	3.9	—	2	—	Girls	Local	Dec 2013–Jan 2014	Overall	Moemenbellah–Fard et al., 2016*
Asadabad	Hamadan	188	412	600	1	13	14	0.53	3.2	2.3	16	600	Both	Local	2013–2014	Randomly	Nazari et al., 2016a*
Asadabad	Hamadan	—	—	30168	—	—	564	—	—	1.9	—	16438	Both	Local	Oct 2015–Jun 2016	Overall	Nazari et al., 2016b*
Paveh	Kermanshah	—	485	—	—	85	—	—	17.5	—	5	485	Girls	Local	—	Overall	Sayyad et al., 2016*
Khorramshahr	Khuzestan	—	170	—	—	22	—	—	12.9	—	—	—	Girls	Local	Mar–Apr 2015	Overall	Ghajari et al., 2017*
Pakdasht, Pishva, Qrachak and Varamin	Tehran	—	—	3483	—	—	—	—	—	7.9	10	3483	Both	Local	Oct 2014–Jun 2015	Randomly	Ghandali et al., 2017*
Zanjan	Zanjan	—	915	—	—	95	—	—	10.6	—	—	—	Girls	Local	—	Overall	Ghavami Ahmadi, 2017*
Lowshan	Gilan	—	414	—	—	78	—	—	18.8	—	—	—	Both	Local	2016	Randomly	Goodarzvand Chegini et al., 2017*
Mashhad	Razavi Khorasan	—	—	—	—	—	1810	—	—	48.7	—	—	Both	Local	Oct–Dec 2017	Overall	Jarahi et al., 2017*
Jahrom	Fars	330	387	717	14	35	49	4.2	9.0	6.8	—	717	Both	Local	2016–2017	Randomly	Majidi et al., 2017*
Sirik	Hormozgan	—	358	—	—	201	—	—	56.1	—	—	358	Girls	Local	Nov 2015–Feb 2016	Randomly	Sanei–Dehkordi et al., 2017*
Bashagard	Hormozgan	—	300	—	—	202	—	—	67.3	—	—	300	Girls	Local	—	Randomly	Soleimani–Ahmadi et al., 2017*
Meshginshahr	Ardabil	895	1055	1950	69	131	200	3.5	6.7	10.3	20	1950	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018*
Yazd	Yazd	338	312	650	3	14	17	0.9	4.5	2.6	30	650	Both	Local	Oct–Mar 2013	Randomly	Ebrahimzadeh Ardakani, Fayazi Bargin, 2018*
Meshginshahr	Ardabil	895	1055	1950	69	131	200	7.7	12.4	10.3	20	1950	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018*
Meybod	Yazd	—	402	—	—	59	—	—	14.7	—	4	402	Girls	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018*

Table 1. Continuation

Counties	Provinces	E			I			I (%)			Sampling					References	
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date		Selection
Andimeshk, Dezful and Shush	Khuzestan	13141	15269	28410	797	2198	2995	6.1	14.4	10.5	280	28410	Both	Local	Feb–Jun 2016	Randomly	Nejati et al., 2018*
	Qom	–	1725	–	–	229	–	–	13.3	–	75	1725	Girls	Local	Mar 2015–Mar 2017	Randomly	Saghafipour et al., 2018*
Sabzevar	Razavi Khorasan	–	–	1200	–	–	146	8.6	18.9	12.2	–	1200	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018*
Mashhad	Razavi Khorasan	–	–	–	33	121	154	21.4	78.6	–	–	–	Both	Local	Sep 2015–Mar 2016	Randomly	Tashakori et al., 2018*
Mashhad	Razavi Khorasan	–	–	–	–	–	–	–	–	42.6	–	–	Both	Local	Nov 2016–Mar 2017	Overall	Beygi et al., 2019*
Badrud	Isfahan	808	787	1595	10	115	125	0.62	7.2	7.8	–	1595	Both	Local	2017–2018	Overall	Dehghani et al., 2019*
Tonekabon	Mazandaran	–	1466	–	–	292	–	–	19.9	–	–	1466	Girls	Local	2017–2018	Randomly	Heidarpour et al., 2019*
Kavar	Fars	–	3728	–	–	87	–	–	2.3	–	21	–	Girls	Local	Dec 2016–Jul 2017	Randomly	Kalari et al., 2019*
Karun	Khuzestan	–	851	–	–	199	–	–	23.4	–	–	851	Girls	Local	2017–2018	Randomly	Ghofseh Maramazi et al., 2019*
Mashhad	Razavi Khorasan	–	3062	–	–	417	–	–	13.6	–	–	3062	Girls	Local	2017–2018	Randomly	Mohammadi et al., 2019*
Jam	Bushehr	–	854	–	–	132	–	–	15.4	–	–	–	Girls	Local	2019	Overall	Asadian et al., 2020*
Ardabil, Tabriz, Urmia and Zanjan	Ardabil, East Azerbaijan, West Azerbaijan and Zanjan	–	6410	–	–	562	–	–	8.8	–	52	–	Both	Across	2016–2018	Overall	Ghavamni et al., 2020*
Ahvaz	Khuzestan	–	–	41392	–	–	504	–	–	1.2	–	41392	Both	Local	2008	Overall	Kassiri et al., 2020a*
Ahvaz	Khuzestan	–	–	30762	–	–	621	–	–	2.0	–	30762	Both	Local	2009	Overall	Kassiri et al., 2020a*
Ahvaz	Khuzestan	–	–	35721	–	–	528	–	–	1.5	–	35721	Both	Local	2010	Overall	Kassiri et al., 2020a*

Table 2. *Pediculus capitis* infestation in the age groups of primary school students, based on a literature search

Countries Age groups	Provinces	E		I		I (%)		Sampling				References						
		Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection				
6 years	Iranshahr	Sistan and Baluchestan	–	35	–	–	3	–	8.6	–	12	35	Girls	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003*	
		Kerman	–	–	7412	–	–	298	–	–	4.0	198	40586	Both	Local	Mar–Jun 2006	Overall	Motovali-Emami et al., 2008*
	Urmia	West Azerbaijan	–	–	47	–	–	4	–	–	8.5	35	2040	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012*
		Hormozgan	–	5	–	–	–	–	–	20.0	–	–	358	Girls	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017*
	Karun	Khuzestan	–	–	126	–	–	39	–	–	31.0	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b*
	Ahvaz	Khuzestan	–	–	999	–	–	279	–	–	27.9	–	5930	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaei, 2021*
	Tabriz	East Azerbaijan	–	–	628	–	–	38	–	–	6.1	33	3032	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021*
7 years																		
Yasuj	Kohgiluyeh and Boyer-Ahmad	1233	1148	2381	5	176	181	0.41	15.3	7.6	64	2567	Both	Local	Nov–Dec 1999	Overall	Shahraki et al., 2001*	
	Sistan and Baluchestan	–	151	–	–	42	–	–	27.8	–	12	918	Girls	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003*	
Qom	Qom	–	319	–	–	–	–	–	1.9	–	–	1650	Girls	Local	–	Randomly	Farzinnia et al., 2004*	
	Kurdistan	–	–	230	–	–	26	–	–	11.3	18	1195	Girls	Local	–	Randomly	Davari, Yaghmaei, 2005*	
Sanandaj	Kerman	–	–	195	–	–	7	–	–	3.6	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005*	
	Hamadan	–	–	56	–	–	11	–	–	19.6	12	847	Both	Local	–	Overall	Nazari et al., 2006*	
Amlash	Gilan	–	–	754	–	–	76	–	–	10.1	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006*	
	Sistan and Baluchestan	–	228	–	–	46	–	–	20.2	–	32	–	Girls	Local	2003	Randomly	Zareban et al., 2006*	

Qeshm	Hormozgan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Both	Local	-	Randomly	Soleimani-Ahmadi, 2007*
Sanandaj	Kurdistan	-	113	-	-	-	-	1	-	-	0.88	-	-	600	Girls	Local	2005	Randomly	Yaghmaei et al., 2007*	
Kerman	Kerman	-	-	6051	-	-	-	-	194	-	-	3.2	198	40586	Both	Local	Mar-Jun 2006	Overall	Motavali-Emami et al., 2008*	
Bahar	Hamadan	-	-	180	-	-	-	-	3	-	-	1.7	18	900	Both	Local	Feb-Jun 2008	Randomly	Moradi et al., 2009*	
Khajeh	East Azerbaijan	-	-	96	-	-	-	-	13	-	-	13.5	20	500	Both	Local	2008-2009	Randomly	Shayeghi et al., 2010*	
Urmia	West Azerbaijan	-	-	423	-	-	-	-	20	-	-	4.7	35	2040	Both	Local	Oct-Dec 2010	Randomly	Hazrati Tappeh et al., 2012*	
Qom	Qom	-	-	-	-	-	-	-	-	-	23.6	-	-	-	-	Local	2010	Randomly	Saghafipour et al., 2012*	
Sanandaj	Kurdistan	-	148	-	-	-	-	4	-	-	2.7	-	27	810	Girls	Local	-	Randomly	Vahabi et al., 2012*	
Robat Karim	Tehran	-	10000	-	-	-	-	22	-	-	22.5	-	-	10000	Girls	Local	2008-2009	Randomly	Afshari et al., 2013*	
Qom	Qom	-	-	-	-	-	-	28	-	-	15.5	-	45	900	Girls	Local	2011	Overall	Noroozi et al., 2013*	
Ravansar	Kermanshah	-	75	-	-	-	-	15	-	-	20.0	-	6	385	Girls	Local	-	Overall	Sayyadi et al., 2013*	
Paveh	Kermanshah	-	125	-	-	-	-	14	-	-	11.2	-	25	750	Girls	Local	2009-2010	Randomly	Vahabi et al., 2013*	
Aran va Bidgol	Isfahan	-	-	717	-	-	-	-	1	-	-	0.14	19	3589	Both	Local	Oct-Dec 2008	Randomly	Doroodgar et al., 2014a*	
Kashan	Isfahan	-	-	624	-	-	-	-	2	-	-	0.3	23	624	Both	Local	Nov 2012-May 2013	Randomly	Doroodgar et al., 2014b*	
Damghan	Semnan	-	-	-	-	-	-	11	-	-	11.3	-	-	2700	Girls	Local	2008	Overall	Mohammadi Azni, 2014*	
Azadshahr	Golestan	-	287	-	-	-	-	15	-	-	5.2	-	-	1510	Girls	Local	2012-2013	Overall	Motevalli Haghi et al., 2014a*	
Sari	Mazandaran	-	-	678	-	-	-	-	9	-	-	1.3	-	4712	Both	Local	2012-2013	Randomly	Motevalli Haghi et al., 2014b*	
Abadan	Khuzestan	-	-	104	-	-	-	-	5	-	-	4.8	26	104	Both	Local	2012	Randomly	Salehi et al., 2014*	

Table 2. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection
Bayengan	Kermanshah	–	–	49	–	–	5	–	–	10.2	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014*
	Bonab	–	608	–	–	–	14	–	2.3	–	–	3757	Girls	Local	2013–2014	Overall	Kabiri et al., 2015*
	Savojbolagh	–	–	2762	–	–	47	–	–	1.7	–	2744	Both	Local	Sep–Dec 2013	Overall	Bahrami et al., 2016*
Galugah	Mazandaran	–	–	53	–	–	4	–	–	7.5	16	300	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016*
Khorramshahr	Khuzestan	–	–	–	–	–	–	–	–	3.3	10	750	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016*
Kalaleh	Golestan	–	–	190	–	–	9	–	–	4.7	4	3757	Girls	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016*
Paveh	Kermanshah	–	101	–	–	11	–	–	10.9	–	5	485	Girls	Local	–	Overall	Sayyad et al., 2016*
Sirik	Hormozgan	–	49	–	–	–	–	–	33.0	–	–	358	Girls	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017*
Bashagard	Hormozgan	–	50	–	–	–	–	–	50.0	–	–	300	Girls	Local	–	Randomly	Soleimani-Ahmadi et al., 2017 *
Meshginshahr	Ardabil	–	–	663	–	–	68	–	–	3.5	20	1950	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018*
Meshginshahr	Ardabil	–	–	351	–	–	68	–	–	19.4	20	1950	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018*
Meybod	Yazd	–	69	–	–	15	–	–	21.7	–	4	402	Girls	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018*
Andimeshk, Dezful and Shush	Khuzestan	–	–	4697	–	–	773	–	–	16.5	280	28410	Both	Local	Feb–Jun 2016	Randomly	Nejati et al., 2018*
Qom	Qom	–	345	–	–	52	–	–	15.1	–	75	1725	Girls	Local	Mar 2015–Mar 2017	Randomly	Saghafipour et al., 2018*
Sabzevar	Razavi Khorasan	–	–	210	–	–	27	–	–	12.9	–	1200	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018*
Badrud	Isfahan	–	–	245	–	–	30	–	–	1.9	–	1595	Both	Local	2017–2018	Overall	Delghani et al., 2019*

Tonekabon	Mazandaran	–	243	–	–	55	–	–	22.6	–	–	1466	Girls	Local	2017–2018	Randomly	Heidarpour et al., 2019*
Mashhad	Razavi Khorasan	–	475	–	–	95	–	–	20.0	–	–	3062	Girls	Local	2017–2018	Randomly	Mohammadi et al., 2019*
Karun	Khuzestan	–	–	125	–	–	38	–	–	30.4	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020*
Semnan	Semnan	–	–	243	–	–	8	–	–	3.3	8	767	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020*
Khorramabad	Lorestan	–	–	115	–	–	18	–	–	15.7	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	–	–	991	–	–	251	–	–	25.3	–	5930	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaei, 2021*
Tabriz	East Azerbaijan	–	–	1521	–	–	64	–	–	4.2	33	3032	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021*
Gilan-e Gharb	Kermanshah	–	–	500	–	–	25	–	–	5.0	–	2515	Both	Local	2018	Overall	Zahirmia et al., 2021*
Paveh	Kermanshah	–	–	61	–	–	1	–	–	1.6	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghaghgi, 2022
Gahavand	Hamadan	–	77	–	–	16	–	–	20.8	–	–	499	Girls	Local	2020	Overall	Hajiloie et al., 2022*
Marivan	Kurdistan	–	–	8	–	–	3	–	–	37.5	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
Varzaqan	East Azerbaijan	–	–	44	–	–	7	–	–	15.9	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022
8 years																	
Yasuj	Kohgiluyeh and Boyer-Ahmad	1234	1111	2345	6	212	218	0.49	19.1	9.3	64	2567	Both	Local	Nov–Dec 1999	Overall	Shahraki et al., 2001*
Iranshahr	Sistan and Baluchestan	–	156	–	–	40	–	–	25.6	–	12	918	Girls	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003*
Qom	Qom	–	391	–	–	–	–	–	4.5	–	–	1650	Girls	Local	–	Randomly	Farzinnia et al., 2004*
Sanandaj	Kurdistan	–	–	242	–	–	72	–	–	29.7	18	1195	Girls	Local	–	Randomly	Davari, Yaghmaei, 2005*
Kerman	Kerman	–	–	223	–	–	4	–	–	1.8	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005*

Table 2. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection
Hamadan	Hamadan	–	–	75	–	–	8	–	–	10.7	12	847	Both	Local	–	Overall	Nazari et al., 2006*
Amlash	Gilan	–	–	701	–	–	67	–	–	9.6	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006*
Zabol	Sistan and Baluchestan	–	216	–	–	49	–	–	22.7	–	32	–	Girls	Local	2003	Randomly	Zareban et al., 2006*
Qeshm	Hormozgan	–	–	–	–	–	–	–	–	17.4	–	–	Both	Local	–	Randomly	Soleimani-Ahmadi, 2007*
Sanandaj	Kurdistan	–	115	–	–	4	–	–	3.5	–	–	600	Girls	Local	2005	Randomly	Yaghmaei et al., 2007*
Kerman	Kerman	–	–	7965	–	–	103	–	–	1.3	198	40586	Both	Local	Mar–Jun 2006	Overall	Motavali-Emami et al., 2008*
Bahar	Hamadan	–	–	180	–	–	2	–	–	1.1	18	900	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009*
Khajeh	East Azerbaijan	–	–	113	–	–	5	–	–	4.4	20	500	Both	Local	2008–2009	Randomly	Shayeghi et al., 2010*
Urmia	West Azerbaijan	–	–	421	–	–	17	–	–	4.0	35	2040	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012*
Qom	Qom	–	–	–	–	–	–	–	15.3	–	–	–	–	Local	2010	Randomly	Saghafipour et al., 2012*
Sanandaj	Kurdistan	–	140	–	–	9	–	–	6.4	–	27	810	Girls	Local	–	Randomly	Vahabi et al., 2012*
Robat Karim	Tehran	–	10000	–	–	19	–	–	19.4	–	–	10000	Girls	Local	2008–2009	Randomly	Afshari et al., 2013*
Qom	Qom	–	–	–	–	18	–	–	10.0	–	45	900	Girls	Local	2011	Overall	Noroozi et al., 2013*
Ravansar	Kermanshah	–	63	–	–	11	–	–	17.5	–	6	385	Girls	Local	–	Overall	Sayyadi et al., 2013*
Paveh	Kermanshah	–	117	–	–	13	–	–	11.1	–	25	750	Girls	Local	2009–2010	Randomly	Vahabi et al., 2013*
Aran va Bidgol	Isfahan	–	–	658	–	–	4	–	–	0.58	19	3589	Both	Local	Oct–Dec 2008	Randomly	Doroodgar et al., 2014a*

Table 2. Continuation

Counties	Provinces	E		I			I (%)			Sampling				References			
		Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date	Selection				
Qom	Qom	–	347	–	–	36	–	10.4	–	–	75	1725	Girls	Local	Mar 2015– Mar 2017	Randomly	Saghafipour et al., 2018*
Sabzevar	Razavi Khorasan	–	–	222	–	–	33	–	–	14.9	–	1200	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018*
Badrud	Isfahan	–	–	240	–	–	24	–	–	1.5	–	1595	Both	Local	2017–2018	Overall	Dehghani et al., 2019*
Tonekabon	Mazandaran	–	233	–	–	32	–	13.7	–	–	–	1466	Girls	Local	2017–2018	Randomly	Heidarpour et al., 2019*
Mashhad	Razavi Khorasan	–	512	–	–	53	–	10.4	–	–	–	3062	Girls	Local	2017–2018	Randomly	Mohammadi et al., 2019*
Karun	Khuzestan	–	–	123	–	–	47	–	–	38.2	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b*
Semnan	Semnan	–	–	243	–	–	8	–	–	3.3	8	767	Both	Local	Mar 2018– May 2018	Randomly	Shirzadi et al., 2020*
Khorramabad	Lorestan	–	–	159	–	–	23	–	–	14.5	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	–	–	992	–	–	290	–	–	29.2	–	5930	Both	Local	Jan 2016– Jun 2017	Randomly	Kassiri, Mehraghaei, 2021*
Tabriz	East Azerbaijan	–	–	1521	–	–	64	–	–	4.2	33	3032	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021*
Gilan-e Gharb	Kermanshah	–	–	409	–	–	13	–	–	3.2	–	2515	Both	Local	2018	Overall	Zahrimia et al., 2021*
Paveh	Kermanshah	–	–	65	–	–	3	–	–	4.6	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghaghgi, 2022
Gahavand	Hamadan	–	78	–	–	13	–	16.7	–	–	–	499	Girls	Local	2020	Overall	Hajiloie et al., 2022*
Marivan	Kurdistan	–	–	44	–	–	15	–	–	34.1	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
Varzaqan	East Azerbaijan	–	–	61	–	–	7	–	–	11.5	26	400	Both	Local	Dec 2019– Jan 2020	Randomly	Sepehri, Jafari, 2022
9 years																	
Yasuj	Kohgiluyeh and Boyer- Ahmad	1207	1067	2274	17	259	276	1.4	24.3	12.1	64	2567	Both	Local	Nov–Dec 1999	Overall	Shahraki et al., 2001*

Table 2. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection
Kashan	Isfahan	–	–	517	–	–	2	–	–	0.4	23	624	Both	Local	Nov 2012– May 2013	Randomly	Doroodgar et al., 2014b*
Damghan	Semnan	–	–	–	–	19	–	–	19.6	–	–	2700	Girls	Local	2008	Overall	Mohammadi Azni, 2014*
Azadshahr	Golestan	–	239	–	–	13	–	–	5.4	–	–	1510	Girls	Local	2012–2013	Overall	Motevalli Haghi et al., 2014a*
Sari	Mazandaran	–	–	702	–	–	11	–	–	1.6	–	4712	Both	Local	2012–2013	Randomly	Motevalli Haghi et al., 2014b*
Abadan	Khuzestan	–	–	104	–	–	3	–	–	2.9	26	104	Both	Local	2012	Randomly	Salehi et al., 2014*
Bayangan	Kermanshah	–	–	90	–	–	13	–	–	14.4	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014*
Bonab	East Azerbaijan	–	621	–	–	24	–	–	3.9	–	–	3757	Girls	Local	2013–2014	Overall	Kabiri et al., 2015*
Savojbolagh	Alborz	–	–	2701	–	–	52	–	–	1.9	–	2744	Both	Local	Sep–Dec 2013	Overall	Bahrani et al., 2016*
Galugah	Mazandaran	–	–	63	–	–	5	–	–	7.9	16	300	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016*
Khorramshahr	Khuzestan	–	–	–	–	–	–	–	–	3.4	10	750	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016*
Kalaleh	Golestan	–	–	184	–	–	11	–	–	6.0	4	3757	Girls	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016*
Paveh	Kermanshah	–	92	–	–	18	–	–	19.6	–	5	485	Girls	Local	–	Overall	Sayyad et al., 2016*
Sirik	Hormozgan	–	59	–	–	–	–	–	31.0	–	–	358	Girls	Local	Nov 2015– Feb 2016	Randomly	Sanei-Dehkordi et al., 2017*
Bashagard	Hormozgan	–	43	–	–	–	–	–	81.4	–	–	300	Girls	Local	–	Randomly	Soleimani-Ahmadi et al., 2017*
Meshginshahr	Ardabil	–	–	390	–	–	40	–	–	2.1	20	1950	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018*
Meshginshahr	Ardabil	–	–	320	–	–	40	–	–	12.5	20	1950	Both	Local	Oct 2015– Jun 2016	Randomly	Moradiasl et al., 2018*

Meybod	Yazd	-	82	-	-	-	-	-	-	13.4	-	4	402	Girls	Local	2015-2016	Randomly	Morovati Sharif Abadi et al., 2018*
Andimeshk, Dezful and Shush	Khuzestan	-	-	7011	-	-	526	-	-	7.5	280	28410	Both	Both	Local	Feb-Jun 2016	Randomly	Nejati et al., 2018*
Qom	Qom	-	343	-	-	-	42	-	-	12.2	-	75	1725	Girls	Local	Mar 2015-Mar 2017	Randomly	Saghafipour et al., 2018*
Sabzevar	Razavi Khorasan	-	-	189	-	-	28	-	-	14.8	-	-	1200	Both	Local	2015-2016	Randomly	Tarkhasi et al., 2018*
Badrud	Isfahan	-	246	-	-	-	19	-	-	1.2	-	-	1595	Both	Local	2017-2018	Overall	Dehghani et al., 2019*
Tonekabon	Mazandaran	-	265	-	-	-	48	-	-	18.1	-	-	1466	Girls	Local	2017-2018	Randomly	Heidarpour et al., 2019*
Mashhad	Razavi Khorasan	-	526	-	-	-	84	-	-	16.0	-	-	3062	Girls	Local	2017-2018	Randomly	Mohammadi et al., 2019*
Karun	Khuzestan	-	-	123	-	-	30	-	-	24.4	-	-	751	Both	Local	2017	Randomly	Kassiri et al., 2020b*
Semnan	Semnan	-	-	259	-	-	17	-	-	6.6	8	767	Both	Both	Local	Mar 2018-May 2018	Randomly	Shirzadi et al., 2020*
Khorramabad	Lorestan	-	-	332	-	-	35	-	-	10.5	-	3890	Both	Both	Local	2018-2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	-	992	-	-	-	244	-	-	24.6	-	5930	Both	Both	Local	Jan 2016-Jun 2017	Randomly	Kassiri, Mehraghaei, 2021*
Tabriz	East Azerbaijan	-	-	1521	-	-	64	-	-	4.2	33	3032	Both	Both	Local	Jan-Mar 2018	Randomly	Norouzi et al., 2021*
Gilan-e Gharb	Kermanshah	-	-	459	-	-	10	-	-	2.2	-	2515	Both	Both	Local	2018	Overall	Zahrimia et al., 2021*
Paveh	Kermanshah	-	-	66	-	-	7	-	-	10.6	11	361	Both	Both	Local	Oct-Dec 2018	Overall	Bekri, Shaghaghi, 2022
Gahavand	Hamadan	-	91	-	-	-	17	-	-	18.7	-	499	Girls	Girls	Local	2020	Overall	Hajiloie et al., 2022*
Mariwan	Kurdistan	-	-	111	-	-	22	-	-	19.8	-	457	Both	Both	Local	2018-2019	Randomly	Rad et al., 2022
Varzaqan	East Azerbaijan	-	-	66	-	-	6	-	-	9.1	26	400	Both	Both	Local	Dec 2019-Jan 2020	Randomly	Sepehri, Jafari, 2022
10 years																		
Yasuj	Kohgiluyeh and Boyer-Ahmad	1384	1296	2680	20	306	326	1.4	23.6	12.2	64	2567	Both	Both	Local	Nov-Dec 1999	Overall	Shahraki et al., 2001*

Table 2. Continuation

Countries	Age groups	Provinces	E		I			I (%)			Sampling				References			
			Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender		Location	Date	Selection
Iranshahr	Qom	Sistan and Baluchestan	–	184	–	–	56	–	–	30.4	–	12	918	Girls	Local	Nov 2002–May 2003	Randomly	Alenpour Salemi et al., 2003*
		Qom	–	351	–	–	–	–	–	7.4	–	–	–	1650	Girls	Local	–	Randomly
Sanandaj		Kurdistan	–	–	263	–	–	42	–	–	15.9	18	1195	Girls	Local	–	Randomly	Davari, Yaghmaei, 2005*
Kerman		Kerman	–	–	224	–	–	2	–	–	0.89	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005*
Hamadan		Hamadan	–	–	89	–	–	14	–	–	15.7	12	–	–	Local	–	Overall	Nazari et al., 2006*
Amlash		Gilan	–	–	932	–	–	83	–	–	8.9	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006*
Zabol		Sistan and Baluchestan	–	209	–	–	75	–	–	35.9	–	32	–	Girls	Local	2003	Randomly	Zareban et al., 2006*
Qeshm		Hormozgan	–	–	–	–	–	–	–	–	24.8	–	–	Both	Local	–	Randomly	Soleimani-Ahmadi, 2007*
Sanandaj		Kurdistan	–	104	–	–	8	–	–	7.7	–	–	600	Girls	Local	2005	Randomly	Yaghmaei et al., 2007*
Kerman		Kerman	–	–	8972	–	–	45	–	–	0.5	198	40586	Both	Local	Mar–Jun 2006	Overall	Motovali-Emami et al., 2008*
Bahar		Hamadan	–	–	180	–	–	4	–	–	2.2	18	900	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009*
Khajeh		East Azerbaijan	–	–	87	–	–	2	–	–	2.3	20	500	Both	Local	2008–2009	Randomly	Shayeghi et al., 2010*
Urmia		West Azerbaijan	–	–	414	–	–	15	–	–	3.6	35	2040	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012*
Qom		Qom	–	–	–	–	–	–	–	16.8	–	–	–	–	Local	2010	Randomly	Saghafipour et al., 2012*
Sanandaj		Kurdistan	–	144	–	–	11	–	–	7.6	–	27	810	Girls	Local	–	Randomly	Vahabi et al., 2012*
Robat Karim		Tehran	–	10000	–	–	21	–	–	21.4	–	–	10000	Girls	Local	2008–2009	Randomly	Afshari et al., 2013*
Qom		Qom	–	–	–	–	20	–	–	11.1	–	45	900	Girls	Local	2011	Overall	Noroozi et al., 2013*
Ravansar		Kermanshah	–	78	–	–	14	–	–	17.9	–	6	385	Girls	Local	–	Overall	Sayyadi et al., 2013

Table 2. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection
Andimeshk, Dezful and Shush	Khuzestan	–	–	5460	–	–	499	–	–	9.1	280	28410	Both	Local	Feb–Jun 2016	Randomly	Nejati et al., 2018*
	Qom	–	344	–	–	38	–	–	11.0	–	75	1725	Girls	Local	Mar 2015–Mar 2017	Randomly	Saghafipour et al., 2018*
	Sabzevar	–	–	204	–	–	18	–	–	8.8	–	1200	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018*
	Badrud	–	–	250	–	–	28	–	–	1.8	–	1595	Both	Local	2017–2018	Overall	Dehghani et al., 2019*
Tonekabon	Mazandaran	–	231	–	–	51	–	–	22.1	–	–	1466	Girls	Local	2017–2018	Randomly	Heidarpour et al., 2019*
Mashhad	Razavi Khorasan	–	526	–	–	74	–	–	14.1	–	–	3062	Girls	Local	2017–2018	Randomly	Mohammadi et al., 2019*
Karun	Khuzestan	–	–	123	–	–	37	–	–	30.1	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b*
Birjand	South Khorasan	–	417	–	–	62	–	–	14.9	–	19	2417	Girls	Local	2017	Randomly	Lashkari et al., 2020*
Semnan	Semnan	–	–	259	–	–	17	–	–	6.6	8	767	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020*
Khorramabad Ahvaz	Lorestan	–	–	989	–	–	23	–	–	2.3	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
	Khuzestan	–	–	979	–	–	296	–	–	30.2	–	5930	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaci, 2021*
Tabriz	East Azerbaijan	–	–	883	–	–	28	–	–	3.2	33	3032	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021*
Gilan-e Gharb	Kermanshah	–	–	390	–	–	7	–	–	1.8	–	2515	Both	Local	2018	Overall	Zahirmia et al., 2021*
	Kermanshah	–	–	64	–	–	9	–	–	14.1	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghagh, 2022
Gahavand Marivan Varzaqan	Hamadan	–	87	–	–	15	–	–	17.2	–	–	499	Girls	Local	2020	Overall	Hajiloie et al., 2022*
	Kurdistan	–	–	127	–	–	32	–	–	25.2	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
	East Azerbaijan	–	–	93	–	–	11	–	–	11.8	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022

11 years

Yasuj	Kohgiluyeh and Boyer-Ahmad	1380	1187	2567	12	313	325	0.87	26.4	12.7	64	2567	Both	Local	Nov-Dec 1999	Overall	Shahraki et al., 2001*
Iranshahr	Sistan and Baluchestan	-	131	-	-	33	-	-	25.2	-	12	918	Girls	Local	Nov 2002-May 2003	Randomly	Alempour Salemi et al., 2003*
Qom	Qom	-	381	-	-	-	-	-	4.9	-	-	1650	Girls	Local	-	Randomly	Farzinnia et al., 2004*
Sanandaj	Kurdistan	-	-	262	-	-	30	-	-	11.5	18	1195	Girls	Local	-	Randomly	Davari, Yaghmaei, 2005*
Kerman	Kerman	-	-	259	-	-	13	-	-	5.0	50	1200	Both	Local	Apr-Jun 2003	Randomly	Kamiabi, Nakhaei, 2005*
Hamadan	Hamadan	-	-	97	-	-	7	-	-	7.2	12	-	-	Local	-	Overall	Nazari et al., 2006*
Amlash	Gilan	-	-	1003	-	-	85	-	-	8.5	95	4244	Both	Local	2003-2004	Overall	Rafinejad et al., 2006*
Zabol	Sistan and Baluchestan	-	201	-	-	88	-	-	43.8	-	32	-	Girls	Local	2003	Randomly	Zareban et al., 2006*
Qeshm	Hormozgan	-	-	-	-	-	-	-	-	27.3	-	-	Both	Local	-	Randomly	Soleimani-Ahmadi, 2007*
Sanandaj	Kurdistan	-	103	-	-	15	-	-	14.6	-	-	600	Girls	Local	2005	Randomly	Yaghmaei et al., 2007*
Kerman	Kerman	-	-	282	-	-	1	-	-	0.35	198	40586	Both	Local	Mar-Jun 2006	Overall	Motavali-Emami et al., 2008*
Bahar	Hamadan	-	-	180	-	-	1	-	-	0.56	18	900	Both	Local	Feb-Jun 2008	Randomly	Moradi et al., 2009*
Khajeh	East Azerbaijan	-	-	99	-	-	1	-	-	1.0	20	500	Both	Local	2008-2009	Randomly	Shayeghi et al., 2010*
Urmia	West Azerbaijan	-	-	376	-	-	13	-	-	3.5	35	2040	Both	Local	Oct-Dec 2010	Randomly	Hazrati Tappeh et al., 2012*
Qom	Qom	-	-	-	-	-	-	-	26.0	-	-	-	-	Local	2010	Randomly	Saghafipour et al., 2012*
Sanandaj	Kurdistan	-	201	-	-	10	-	-	5.0	-	27	810	Girls	Local	-	Randomly	Vahabi et al., 2012*
Robat Karim	Tehran	-	10000	-	-	12	-	-	12.2	-	-	10000	Girls	Local	2008-2009	Randomly	Afshari et al., 2013*
Qom	Qom	-	-	-	-	32	-	-	17.7	-	45	900	Girls	Local	2011	Overall	Noroozi et al., 2013*
Ravansar	Kermanshah	-	92	-	-	13	-	-	14.1	-	6	385	Girls	Local	-	Overall	Sayyadi et al., 2013*

Table 2. Continuation

Counties	Provinces	E			I			I (%)			Sampling					References	
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date		Selection
Paveh Aran va Bidgol Kashan	Kermanshah	–	144	–	–	14	–	–	9.7	–	25	750	Girls	Local	2009–2010	Randomly	Vahabi et al., 2013*
	Isfahan	–	–	742	–	–	3	–	–	0.4	19	3589	Both	Local	Oct–Dec 2008	Randomly	Doroodgar et al., 2014a*
	Isfahan	–	–	486	–	–	5	–	–	1.0	23	624	Both	Local	Nov 2012–May 2013	Randomly	Doroodgar et al., 2014b*
	Semnan	–	–	–	–	30	–	–	30.9	–	–	2700	Girls	Local	2008	Overall	Mohammadi Azni, 2014*
Azadshahr	Golestan	–	229	–	–	3	–	–	1.3	–	–	1510	Girls	Local	2012–2013	Overall	Motevalli Haghi et al., 2014a*
	Mazandaran	–	–	890	–	–	19	–	–	2.1	–	4712	Both	Local	2012–2013	Randomly	Motevalli Haghi et al., 2014b*
Abadan Bayangan Bonab	Khuzestan	–	–	104	–	–	7	–	–	6.7	26	104	Both	Local	2012	Randomly	Salehi et al., 2014*
	Kermanshah	–	–	65	–	–	16	–	–	24.6	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014*
	East Azerbaijan	–	641	–	–	20	–	–	3.1	–	–	3757	Girls	Local	2013–2014	Overall	Kabiri et al., 2015*
Savojbolagh	Alborz	–	–	2098	–	–	41	–	–	2.0	–	2744	Both	Local	Sep–Dec 2013	Overall	Bahrani et al., 2016*
	Mazandaran	–	–	68	–	–	3	–	–	4.4	16	300	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016*
Khorramshahr	Khuzestan	–	–	–	–	–	–	–	–	0.7	10	750	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016*
	Golestan	–	–	167	–	–	15	–	–	9.0	4	3757	Girls	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016*
Paveh Sirik	Kermanshah	–	105	–	–	22	–	–	21.0	–	5	485	Girls	Local	–	Overall	Sayyad et al., 2016*
	Hormozgan	–	55	–	–	–	–	–	39.0	–	–	358	Girls	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017*
Bashagard	Hormozgan	–	57	–	–	–	–	–	71.9	–	–	300	Girls	Local	–	Randomly	Soleimani-Ahmadi et al., 2017*
Meshginshahr	Ardebil	–	–	108	–	–	11	–	–	0.55	20	1950	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018*
Meshginshahr	Ardebil	–	–	321	–	–	13	–	–	4.0	20	1950	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018*

Meybod	Yazd	—	53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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Table 2. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Date
Kerman	Kerman	–	–	86	–	–	5	–	–	5.8	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005*
Amlash	Gilan	–	–	21	–	–	2	–	–	9.5	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006*
Sanandaj	Kurdistan	–	66	–	–	11	–	–	16.7	–	–	600	Girls	Local	2005	Randomly	Yaghmaei et al., 2007*
Urmia	West Azerbaijan	–	–	826	–	–	29	–	–	3.5	35	2040	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012*
Robat Karim	Tehran	–	10000	–	–	1	–	–	1.0	–	–	10000	Girls	Local	2008–2009	Randomly	Afshari et al., 2013*
Ravansar	Kermanshah	–	77	–	–	8	–	–	10.4	–	6	385	Girls	Local	–	Overall	Sayyadi et al., 2013*
Paveh	Kermanshah	–	176	–	–	8	–	–	4.5	–	25	750	Girls	Local	2009–2010	Randomly	Vahabi et al., 2013*
Azadshahr	Golestan	–	246	–	–	5	–	–	2.0	–	–	1510	Girls	Local	2012–2013	Overall	Motevali Haghi et al., 2014a*
Sari	Mazandaran	–	–	902	–	–	15	–	–	1.7	–	4712	Both	Local	2012–2013	Randomly	Motevali Haghi et al., 2014b*
Abadan	Khuzestan	–	–	104	–	–	4	–	–	3.8	26	104	Both	Local	2012	Randomly	Salehi et al., 2014*
Bonab	East Azerbaijan	–	639	–	–	16	–	–	2.5	–	–	3757	Girls	Local	2013–2014	Overall	Kabiri et al., 2015*
Kalaleh	Golestan	–	–	167	–	–	15	–	–	9.0	4	3757	Girls	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016*
Sirik	Hormozgan	–	45	–	–	–	–	–	36.0	–	–	358	Girls	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017*
Bashagard	Hormozgan	–	47	–	–	–	–	–	68.1	–	–	300	Girls	Local	–	Randomly	Soleimani-Ahmadi et al., 2017*
Meshginshahr	Ardabil	–	–	126	–	–	13	–	–	0.66	20	1950	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018*
Meshginshahr	Ardabil	–	–	320	–	–	11	–	–	3.4	20	1950	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018*
Meybod	Yazd	–	62	–	–	8	–	–	12.9	–	4	402	Girls	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018*
Sabzevar	Razavi Khorasan	–	–	187	–	–	19	–	–	10.2	–	1200	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018*

Table 3. *Pediculus capitis* infestation in the community, based on a literature search

Counties	Provinces	E				I				I (%)				Sampling				References
		Males	Females	Both	Males	Females	Both	Males	Females	Both	Males	Females	Both	Target	Gender	Location	Date	
Kerman	Kerman	-	-	1680	-	-	-	-	-	-	18.7	39.8	31.6	Afghan immigrants	Both	Local	Oct-Nov 1998	Rahnama, Kamyabi, 2001*
Across	Iran	5591	7615	13206	3	755	758	0.05	9.9	5.7				Secondary schools	Both	Across	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Ahvaz	Khuzestan	-	-	1074	-	-	69	-	-	6.4				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Birjand	South Khorasan	-	-	938	-	-	57	-	-	6.1				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Zanjan	Zanjan	-	-	481	-	-	24	-	-	5.0				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Yasuj	Kohgiluyeh and Boyer-Ahmad	-	-	45	-	-	1	-	-	2.2				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Ardabil	Ardabil	-	-	506	-	-	36	-	-	7.1				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Shahrekord	Chaharmahal and Bakhtiari	-	-	1298	-	-	69	-	-	5.3				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Khorramabad	Lorestan	-	-	662	-	-	31	-	-	4.7				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Shiraz	Fars	-	-	774	-	-	33	-	-	4.3				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Arak	Markazi	-	-	551	-	-	14	-	-	2.5				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Kerman	Kerman	-	-	701	-	-	37	-	-	5.3				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Bushehr	Bushehr	-	-	858	-	-	61	-	-	7.1				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Bandar Abbas	Hormozgan	-	-	597	-	-	63	-	-	10.6				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Bojnurd	North Khorasan	-	-	239	-	-	15	-	-	6.3				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*
Isfahan	Isfahan	-	-	590	-	-	29	-	-	4.9				Secondary schools	Both	Local	Jul-Sep 2005	Mozafari Kermani et al., 2008*

Yazd	Yazd	—	—	—	888	—	—	—	—	35	—	—	3.9	Secondary schools	Both	Local	Jul-Sep 2005	Overall	Mozafari Kermani et al., 2008*
Ilam	Ilam	—	—	—	407	—	—	—	—	27	—	—	6.6	Secondary schools	Both	Local	Jul-Sep 2005	Overall	Mozafari Kermani et al., 2008*
Sari	Mazandaran	—	—	—	503	—	—	—	—	23	—	—	4.6	Secondary schools	Both	Local	Jul-Sep 2005	Overall	Mozafari Kermani et al., 2008*
Tabriz	East Azerbaijan	—	—	—	511	—	—	—	—	14	—	—	2.7	Secondary schools	Both	Local	Jul-Sep 2005	Overall	Mozafari Kermani et al., 2008*
Zahedan	Sistan and Baluchestan	—	—	—	804	—	—	—	—	89	—	—	11.1	Secondary schools	Both	Local	Jul-Sep 2005	Overall	Mozafari Kermani et al., 2008*
Senman	Senman	—	—	—	526	—	—	—	—	17	—	—	3.2	Secondary schools	Both	Local	Jul-Sep 2005	Overall	Mozafari Kermani et al., 2008*
Tehran	Tehran	—	—	—	253	—	—	—	—	14	—	—	5.5	Secondary schools	Both	Local	Jul-Sep 2005	Overall	Mozafari Kermani et al., 2008*
Across	Iran	—	—	—	—	866	12471	6.0	6.3	13337	6.0	6.3	6.2	Student community	Both	Across	2005	Overall	Amirkhani et al., 2011*
Bahar	Hamadan	9346	8376	17722	23	1194	1217	0.25	14.3	6.9	6.9	6.9	6.2	Student community	Both	Local	Oct-Dec 2011	Overall	Moradi et al., 2012*
Mashhad	Razavi Khorasan	—	—	55997	34	367	401	8.5	91.5	0.72	0.72	0.72	0.72	Student community	Both	Local	Mar 2006–Feb 2010	Overall	Ramezani Awal Riabi, Atarodi, 2012*
Hamadan	Hamadan	6350	4491	10841	7	107	114	0.11	2.4	1.1	1.1	1.1	1.1	Secondary schools	Both	Local	Oct-Dec 2010	Randomly	Omid et al., 2013*
Ahvaz	Khuzestan	—	—	—	—	140	951	12.8	87.2	—	—	—	—	Health centers	Both	Local	2006–2009	Overall	Kassiri et al., 2015*
Hamadan	Hamadan	384	—	—	—	20	—	5.2	—	—	—	—	—	Central prison	Males	Local	Oct-Mar 2013	Randomly	Nazari et al., 2015*
Asadabad	Hamadan	8726	7712	16438	110	718	828	1.3	9.3	5.0	5.0	5.0	5.0	Student community	Both	Local	Oct 2015–Jun 2016	Overall	Nazari et al., 2016b*
Zahedan	Sistan and Baluchestan	200	300	500	—	—	—	2.0	6.7	4.8	4.8	4.8	4.8	High schools	Both	Local	2013–2015	Randomly	Raeisi et al., 2016*
Mashhad	Razavi Khorasan	—	—	—	405	3362	3767	10.8	89.2	—	—	—	—	Community	Both	Local	Oct-Dec 2017	Overall	Jarahi et al., 2017*
Ahvaz	Khuzestan	—	—	—	36	405	441	8.2	—	8.1	8.1	8.1	8.1	Health centers	Both	Local	2008	Overall	Kassiri, Mardani Kateki, 2018*

Table 3. Continuation

Counties	Provinces	E				I			I (%)			Sampling				References
		Males	Females	Both	Males	Females	Both	Males	Females	Both	Target	Gender	Location	Date	Selection	
Ahvaz	Khuzestan	-	-	-	41	562	603	6.8	-	11.1	Health centers	Both	Local	2009	Overall	Kassiri, Mardani Kateki, 2018*
Ahvaz	Khuzestan	-	-	-	78	704	782	10.0	-	14.4	Health centers	Both	Local	2010	Overall	Kassiri, Mardani Kateki, 2018*
Ahvaz	Khuzestan	-	-	-	45	803	848	5.3	-	15.6	Health centers	Both	Local	2011	Overall	Kassiri, Mardani Kateki, 2018*
Ahvaz	Khuzestan	-	-	-	81	1187	1268	6.4	-	23.3	Health centers	Both	Local	2012	Overall	Kassiri, Mardani Kateki, 2018*
Ahvaz	Khuzestan	-	-	-	23	1481	1504	1.5	-	27.6	Health centers	Both	Local	2013	Overall	Kassiri, Mardani Kateki, 2018*
Ahvaz	Khuzestan	-	-	-	304	5142	5446	5.6	-	16.7	Health centers	Both	Local	2008-2013	Overall	Kassiri, Mardani Kateki, 2018*
Bojnurd	North Khorasan	365	472	867	7	21	28	1.8	4.4	3.2	Kormanj tribes	Both	Local	2016	Randomly	Firoozfar et al., 2019*
Tabriz	East Azerbaijan	226	226	-	-	46	-	-	20.4	-	Adolescents	Both	Local	Sep-Oct 2017	Randomly	Babazadeh et al., 2020*
Sari	Mazandaran	-	-	2590039	-	-	17981	-	-	6.9	Community	Both	Local	2012	Overall	Habibi et al., 2020*
Sari	Mazandaran	-	-	2617250	-	-	20014	-	-	7.6	Community	Both	Local	2013	Overall	Habibi et al., 2020*
Sari	Mazandaran	-	-	2644192	-	-	23859	-	-	9.0	Community	Both	Local	2014	Overall	Habibi et al., 2020*
Sari	Mazandaran	-	-	2678183	-	-	42988	-	-	16.1	Community	Both	Local	2015	Overall	Habibi et al., 2020*
Sari	Mazandaran	-	-	2720672	-	-	37783	-	-	13.9	Community	Both	Local	2016	Overall	Habibi et al., 2020*
Sari	Mazandaran	-	-	2527365	-	-	38997	-	-	15.4	Community	Both	Local	2017	Overall	Habibi et al., 2020*
Sari	Mazandaran	-	-	2483370	-	-	37297	-	-	15.0	Community	Both	Local	2018	Overall	Habibi et al., 2020*
Sari	Mazandaran	-	-	2505194	-	-	24568	-	-	9.8	Community	Both	Local	2019	Overall	Habibi et al., 2020*
Sari	Mazandaran	-	-	-	-	-	-	-	-	-	-	Both	Local	2020	Overall	Habibi et al., 2020*

Sari	Mazandaran	–	–	20766265	–	–	243487	–	–	11.7	Community	Both	Local	2012–2020	Overall	Habibi et al., 2020*
Ahvaz	Khuzestan	31765	54635	86400	19	543	562	0.06	0.99	0.65	Student community	Both	Local	2008	Overall	Kassiri et al., 2020a*
Ahvaz	Khuzestan	20351	43267	63618	21	730	751	0.1	1.7	1.2	Student community	Both	Local	2009	Overall	Kassiri et al., 2020a*
Ahvaz	Khuzestan	30316	44785	75101	3	660	663	0.01	1.5	0.88	Student community	Both	Local	2010	Overall	Kassiri et al., 2020a*
Ahvaz	Khuzestan	34720	43826	78546	33	460	493	0.1	1.0	0.63	Student community	Both	Local	2011	Overall	Kassiri et al., 2020a*
Ahvaz	Khuzestan	24876	65563	90439	47	1553	1600	0.19	2.4	1.8	Student community	Both	Local	2012	Overall	Kassiri et al., 2020a*
Ahvaz	Khuzestan	17368	49321	66689	37	1624	1661	0.21	3.3	2.5	Student community	Both	Local	2013	Overall	Kassiri et al., 2020a*
Ahvaz	Khuzestan	159234	303197	462431	160	5570	5730	0.1	1.8	1.2	Student community	Both	Local	2008–2013	Overall	Kassiri et al., 2020a*
Shiraz	Fars	–	–	–	–	–	59	–	–	2.3	Health centers	Both	Local	2011	Overall	Rezaee et al., 2020*
Shiraz	Fars	–	–	–	–	–	42	–	–	1.6	Health centers	Both	Local	2012	Overall	Rezaee et al., 2020*
Shiraz	Fars	–	–	–	–	–	88	–	–	3.5	Health centers	Both	Local	2013	Overall	Rezaee et al., 2020*
Shiraz	Fars	–	–	–	–	–	247	–	–	9.7	Health centers	Both	Local	2014	Overall	Rezaee et al., 2020*
Shiraz	Fars	–	–	–	–	–	364	–	–	14.3	Health centers	Both	Local	2015	Overall	Rezaee et al., 2020*
Shiraz	Fars	–	–	–	–	–	388	–	–	15.2	Health centers	Both	Local	2016	Overall	Rezaee et al., 2020*
Shiraz	Fars	–	–	–	–	–	409	–	–	16.1	Health centers	Both	Local	2017	Overall	Rezaee et al., 2020*
Shiraz	Fars	–	–	–	–	–	950	–	–	37.3	Health centers	Both	Local	2018	Overall	Rezaee et al., 2020*
Shiraz	Fars	28836	37574	66410	152	2395	2547	0.53	6.4	3.8	Health centers	Both	Local	2011–2018	Overall	Rezaee et al., 2020*

Notes. E – examined, I – infested. *Cited in Nasirian, Ahmadi, 2024.

Table 4. *Pediculus capitis* infestation in the age groups of the community, based on a literature search

Counties	Provinces	E			I			I (%)			Sampling					References	
		Males	Females	Both	Males	Females	Both	Males	Females	Both	Target	Gender	Age (years)	Location	Date		Selection
Sirjan	Kerman	–	–	22	–	–	2	–	–	9.1	Afghani children	Both	< 5	Local	2010–2011	Overall	Yousefi et al., 2012*
Khorramabad	Lorestan	–	–	–	–	–	–	–	10.5	–	Health centers	Females	< 6	Local	2007	Overall	Kasiri, Amani, 2010*
Across	Iran	–	–	–	351	4389	4740	2.5	2.2	2.2	Kindergarten	Both	< 6	Across	2005	Overall	Amirkhani et al., 2011*
Ahvaz	Khuzestan	–	–	1091	–	–	70	–	–	6.4	Health centers	Both	< 6	Local	2006–2009	Overall	Kassiri et al., 2015*
Mashhad	Razavi Khorasan	–	–	–	–	–	575	–	–	15.5	Community	Both	< 6	Local	Oct–Dec 2017	Overall	Jarahi et al., 2017*
Shiraz	Fars	–	–	–	8	120	128	0.25	3.8	4.1	Community	Both	< 6	Local	2012–2015	Overall	Soltani, Keshavarzi, 2018
Shiraz	Fars	–	–	4602	–	–	120	–	–	2.6	Health centers	Both	< 6	Local	2011–2018	Overall	Rezaee et al., 2020*
Ahvaz	Khuzestan	–	–	–	–	–	375	–	–	6.9	Health centers	Both	1–2	Local	2008–2013	Overall	Kassiri, Mardani Kateki, 2018*
Sirjan	Kerman	–	–	39	–	–	7	–	–	17.9	Afghani children	Both	5–8	Local	2010–2011	Overall	Yousefi et al., 2012*
Khorramabad	Lorestan	–	–	–	–	–	–	–	62.1	–	Health centers	Females	6–10	Local	2007	Overall	Kasiri, Amani, 2010*
Ahvaz	Khuzestan	–	–	1091	–	–	504	–	–	46.2	Health centers	Both	6–10	Local	2006–2009	Overall	Kassiri et al., 2015*
Ahvaz	Khuzestan	–	–	–	–	–	2242	–	–	41.2	Health centers	Both	6–10	Local	2008–2013	Overall	Kassiri, Mardani Kateki, 2018*
Shiraz	Fars	–	–	–	–	1787	–	–	56.9	–	Community	Females	6–10	Local	2012–2015	Overall	Soltani, Keshavarzi, 2018*
Shiraz	Fars	–	–	34594	–	–	1935	–	–	5.6	Health centers	Both	6–10	Local	2011–2018	Overall	Rezaee et al., 2020*

Table 4. Continuation

Counties	Provinces	E			I			I (%)			Target	Sampling			References		
		Males	Females	Both	Males	Females	Both	Males	Females	Both		Gender	Age (years)	Location		Date	Selection
Ahvaz	Khuzestan	-	-	1091	-	-	1611	-	-	14.8	Health centers	Both	≥ 18	Local	2006–2009	Overall	Kassiri et al., 2015*
Ahvaz	Khuzestan	-	-	-	-	-	1027	-	-	18.9	Health centers	Both	≥ 18	Local	2008–2013	Overall	Kassiri, Mardani Kateki, 2018*
Karaj	Alborz	-	-	-	-	-	-	-	-	2.0	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Ardabil	Ardabil	-	-	-	-	-	-	-	-	0.81	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Tabriz	East Azerbaijan	-	-	-	-	-	-	-	-	1.1	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Urmia	West Azerbaijan	-	-	-	-	-	-	-	-	3.3	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Bushehr	Bushehr	-	-	-	-	-	-	-	-	2.2	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Shahrekord	Chaharmahal and Bakhtiari	-	-	-	-	-	-	-	-	0.21	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Shiraz	Fars	-	-	-	-	-	-	-	-	0.34	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Rasht	Gilan	-	-	-	-	-	-	-	-	1.8	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Gorgan	Golestan	-	-	-	-	-	-	-	-	9.8	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Hamadan	Hamadan	-	-	-	-	-	-	-	-	0.54	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Bandar Abbas	Hormozgan	-	-	-	-	-	-	-	-	6.4	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Ilam	Ilam	-	-	-	-	-	-	-	-	0.03	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*
Isfahan	Isfahan	-	-	-	-	-	-	-	-	0.04	Student community	Both	6–18	Local	2014–2015	Overall	Ziaoddini et al., 2019*

Table 4. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Males	Females	Both	Males	Females	Both	Males	Females	Both	Target	Gender	Age (years)	Location		Date	Selection
Karaj	Alborz	-	-	-	-	-	-	-	-	1.9	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Ardabil	Ardabil	-	-	-	-	-	-	-	-	11.3	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Tabriz	East Azerbaijan	-	-	-	-	-	-	-	-	1.7	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Urmia	West Azerbaijan	-	-	-	-	-	-	-	-	1.4	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Bushehr	Bushehr	-	-	-	-	-	-	-	-	2.4	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Shahrekord	Chaharmahal and Bakhtiari	-	-	-	-	-	-	-	-	0.35	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Shiraz	Fars	-	-	-	-	-	-	-	-	0.7	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Rasht	Gilan	-	-	-	-	-	-	-	-	2.3	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Gorgan	Golestan	-	-	-	-	-	-	-	-	5.1	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Hamadan	Hamadan	-	-	-	-	-	-	-	-	0.23	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Bandar Abbas	Hormozgan	-	-	-	-	-	-	-	-	4.0	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Ilam	Ilam	-	-	-	-	-	-	-	-	0.69	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Isfahan	Isfahan	-	-	-	-	-	-	-	-	1.9	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Kerman	Kerman	-	-	-	-	-	-	-	-	3.0	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Kermanshah	Kermanshah	-	-	-	-	-	-	-	-	0.62	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*
Bojnurd	North Khorasan	-	-	-	-	-	-	-	-	2.3	Student community	Both	6-18	Local	2015-2016	Overall	Ziaoddini et al., 2019*

Mashhad	Razavi Khorasan	—	—	—	—	—	—	—	—	—	3.5	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Birjand	South Khorasan	—	—	—	—	—	—	—	—	—	0.63	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Ahvaz	Khuzestan	—	—	—	—	—	—	—	—	—	3.1	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Yasuj	Kohgiluyeh and Boyer-Ahmad	—	—	—	—	—	—	—	—	—	7.8	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Sanandaj	Kurdistan	—	—	—	—	—	—	—	—	—	1.5	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Khorramabad	Lorestan	—	—	—	—	—	—	—	—	—	1.7	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Arak	Markazi	—	—	—	—	—	—	—	—	—	1.5	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Sari	Mazandaran	—	—	—	—	—	—	—	—	—	3.3	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Qazvin	Qazvin	—	—	—	—	—	—	—	—	—	1.9	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Qom	Qom	—	—	—	—	—	—	—	—	—	2.4	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Semnan	Semnan	—	—	—	—	—	—	—	—	—	2.9	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Zahedan	Sistan and Baluchestan	—	—	—	—	—	—	—	—	—	7.0	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Tehran	Tehran	—	—	—	—	—	—	—	—	—	2.6	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Yazd	Yazd	—	—	—	—	—	—	—	—	—	0.36	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Zanjan	Zanjan	—	—	—	—	—	—	—	—	—	1.9	Student community	Both	6–18	Local	2015–2016	Overall	Ziaoddini et al., 2019*
Karaj	Alborz	—	—	—	—	—	—	—	—	—	2.7	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Ardabil	Ardabil	—	—	—	—	—	—	—	—	—	10.6	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Tabriz	East Azerbaijan	—	—	—	—	—	—	—	—	—	4.3	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*

Table 4. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Males	Females	Both	Males	Females	Both	Males	Females	Both	Target	Gender	Age (years)	Location		Date	Selection
Urmia	West Azerbaijan	-	-	-	-	-	-	-	-	9.1	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Bushehr	Bushehr	-	-	-	-	-	-	-	-	2.9	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Shahrekord	Chaharmahal and Bakhtiari	-	-	-	-	-	-	-	-	0.24	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Shiraz	Fars	-	-	-	-	-	-	-	-	0.85	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Rasht	Gilan	-	-	-	-	-	-	-	-	2.9	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Gorgan	Golestan	-	-	-	-	-	-	-	-	5.6	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Hamadan	Hamadan	-	-	-	-	-	-	-	-	2.5	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Bandar Abbas	Hormozgan	-	-	-	-	-	-	-	-	4.1	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Ilam	Ilam	-	-	-	-	-	-	-	-	0.55	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Isfahan	Isfahan	-	-	-	-	-	-	-	-	0.86	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Kerman	Kerman	-	-	-	-	-	-	-	-	1.4	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Kermanshah	Kermanshah	-	-	-	-	-	-	-	-	1.3	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Bojnurd	North Khorasan	-	-	-	-	-	-	-	-	3.1	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Mashhad	Razavi Khorasan	-	-	-	-	-	-	-	-	4.0	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Birjand	South Khorasan	-	-	-	-	-	-	-	-	0.7	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Ahvaz	Khuzestan	-	-	-	-	-	-	-	-	5.2	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*

Table 4. Continuation

Counties	Provinces	E			I			I (%)			Sampling				References		
		Males	Females	Both	Males	Females	Both	Males	Females	Both	Target	Gender	Age (years)	Location		Date	Selection
Shiraz	Fars	-	-	-	-	-	-	-	-	1.5	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Rasht	Gilan	-	-	-	-	-	-	-	-	2.1	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Gorgan	Golestan	-	-	-	-	-	-	-	-	5.9	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Hamadan	Hamadan	-	-	-	-	-	-	-	-	2.3	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Bandar Abbas	Hormozgan	-	-	-	-	-	-	-	-	4.8	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Ilam	Ilam	-	-	-	-	-	-	-	-	1.0	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Isfahan	Isfahan	-	-	-	-	-	-	-	-	0.95	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Kerman	Kerman	-	-	-	-	-	-	-	-	1.2	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Kermanshah	Kermanshah	-	-	-	-	-	-	-	-	1.9	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Bojnurd	North Khorasan	-	-	-	-	-	-	-	-	5.4	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Mashhad	Razavi Khorasan	-	-	-	-	-	-	-	-	5.2	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Birjand	South Khorasan	-	-	-	-	-	-	-	-	2.6	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Ahvaz	Khuzestan	-	-	-	-	-	-	-	-	7.9	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Yasuj	Kohgiluyeh and Boyer-Ahmad	-	-	-	-	-	-	-	-	2.0	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*
Sanandaj	Kurdistan	-	-	-	-	-	-	-	-	0.24	Student community	Both	6-18	Local	2016-2017	Overall	Ziaoddini et al., 2019*

Khorramabad	Lorestan	–	–	–	–	–	–	–	–	–	1.1	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Arak	Markazi	–	–	–	–	–	–	–	–	–	1.8	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Sari	Mazandaran	–	–	–	–	–	–	–	–	–	2.8	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Qazvin	Qazvin	–	–	–	–	–	–	–	–	–	3.3	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Qom	Qom	–	–	–	–	–	–	–	–	–	2.4	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Semnan	Semnan	–	–	–	–	–	–	–	–	–	5.2	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Zahedan	Sistan and Baluchestan	–	–	–	–	–	–	–	–	–	2.6	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Tehran	Tehran	–	–	–	–	–	–	–	–	–	7.8	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Yazd	Yazd	–	–	–	–	–	–	–	–	–	1.9	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Zanjan	Zanjan	–	–	–	–	–	–	–	–	–	0.58	Student community	Both	6–18	Local	2016–2017	Overall	Ziaoddini et al., 2019*
Hamadan	Hamadan	130	–	–	7	–	–	–	5.4	–	–	Central prison	Males	21–29	Local	Oct–Mar 2013	Randomly	Nazari et al., 2015*
Mashhad	Razavi Khorasan	–	–	–	–	–	–	305	–	–	8.2	Community	Both	18–30	Local	Oct–Dec 2017	Overall	Jarahi et al., 2017*
Hamadan	Hamadan	135	–	–	8	–	–	–	5.9	–	–	Central prison	Males	30–39	Local	Oct–Mar 2013	Randomly	Nazari et al., 2015*
Mashhad	Razavi Khorasan	–	–	–	–	–	–	518	–	–	13.9	Community	Both	30–60	Local	Oct–Dec 2017	Overall	Jarahi et al., 2017*
Hamadan	Hamadan	116	–	–	5	–	–	–	4.3	–	–	Central prison	Males	≥40	Local	Oct–Mar 2013	Randomly	Nazari et al., 2015*
Mashhad	Razavi Khorasan	–	–	–	–	–	–	9	–	–	0.2	Community	Both	> 60	Local	Oct–Dec 2017	Overall	Jarahi et al., 2017*

Notes. E – examined, I – infested. *Cited in Nasirian, Ahmadi, 2024.

Table 5. The impact of family size on *P. capitis* infestation levels in primary school students, based on a literature search

Countries	Provinces	FS (IN)										Sampling					References						
		E			I			I (%)				Schools	Students	Gender	Location	Date		Selection					
		III	IV	V	VI	≥ 7	III	IV	V	VI	≥ 7	III	IV	V	VI	≥ 7							
Ilam	Ilam	149	149	149	412	412	3	3	3	22	22	22	22	22	6	6	658	Both	Local	Mar 97–Apr 98	Randomly	Gholamiparizad, Abedzadah, 2001**	
Kerman	Kerman	690	690	480	480	30	18	23	23	4	2.6	2.6	4.8	4.8	13.3	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**	
Amlash	Gilan	379	1425	967	610	820	12	52	82	78	167	3.2	3.6	8.5	12.8	20.4	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Kerman	Kerman	15913	15913	20602	20602	4071	109	109	469	469	143	0.68	2.3	2.3	3.5	198	40586	Both	Local	Mar–Jun 2006	Overall	Motavali-Emami et al., 2008**	
Ravansar	Kermanshah	218	218	122	122	45	31	31	17	17	13	14.2	14.2	13.9	13.9	28.9	6	385	Females	Local	–	Overall	Sayyadi et al., 2013**
Azadshahr	Golestan	226	260	192	265	285	1	25	18	4	5	0.44	9.6	9.4	1.5	1.8	–	1510	Females	Local	2012–2013	Overall	Motevalli Haghi et al., 2014a**
Sari	Mazandaran	1017	2543	881	169	34	20	38	15	3	1	2.0	1.5	1.7	1.8	2.9	–	4712	Both	Local	2012–2013	Randomly	Motevalli Haghi et al., 2014b**
Bayangan	Kermanshah	221	221	129	129	34	29	29	17	17	8	13.1	13.1	13.2	13.2	23.5	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014**
Galugah	Mazandaran	62	143	65	30	30	4	9	2	2	2	6.5	6.3	3.1	6.7	6.7	16	300	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016**
Khorramshahr	Khuzestan	–	–	–	–	–	–	–	–	–	–	–	3.0	6.7	9.4	10.0	10	750	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016**
Kalaleh	Golestan	189	180	126	126	126	9	9	15	15	15	4.8	5.0	11.9	11.9	11.9	4	541	Both	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016**
Asadabad	Hamadan	553	47	47	–	–	10	4	4	–	–	1.8	8.5	8.5	–	–	16	600	Both	Local	2013–2014	Randomly	Nazari et al., 2016a**

Sirik	Hormozgan	25	176	176	91	66	–	–	–	–	–	56.0	50.0	50.0	57.1	71.2	–	358	Females	Local	Nov 2015– Feb 2016	Randomly	Sanei-Dekordi et al., 2017 **
Meshginshahr	Ardabil	1266	1266	545	545	139	56	56	111	111	33	2.9	2.9	5.7	5.7	1.7	20	1950	Both	Local	2015– 2016	Randomly	Abbasgholizadeh et al., 2018 **
Meshginshahr	Ardabil	1266	1266	545	545	139	56	56	111	111	33	4.4	4.4	20.4	20.4	23.7	20	1950	Both	Local	Oct 2015– Jun 2016	Randomly	Moradiasl et al., 2018 **
Meybod	Yazd	251	251	151	151	151	35	35	24	24	24	13.9	13.9	15.9	15.9	15.9	4	402	Females	Local	2015– 2016	Randomly	Morovati Sharif Abadi et al., 2018 **
Andimeshk, Dezful and Shush	Khuzestan	4102	9110	7043	8155	8155	331	966	723	975	975	8.1	10.6	10.3	12.0	12.0	280	28410	Both	Local	Feb– Jun 2016	Randomly	Nejati et al., 2018 **
Qom	Qom	201	505	741	278	278	24	63	93	49	49	11.9	12.5	12.6	17.6	17.6	75	1725	Females	Local	Mar 2015– Mar 2017	Randomly	Saghafipour et al., 2018 **
Badrud	Isfahan	307	469	819	–	–	20	39	66	–	–	1.3	2.4	4.1	–	–	–	1595	Both	Local	2017– 2018	Overall	Dehghani et al., 2019 **
Tonekabon	Rasht	381	823	191	34	24	56	158	59	9	8	14.7	19.2	30.9	26.5	33.3	–	1466	Females	Local	2017– 2018	Randomly	Heidarpour et al., 2019 **
Mashhad	Razavi Khorasan	349	1306	852	324	206	63	174	101	46	27	18.1	13.3	11.9	14.2	13.1	–	3062	Females	Local	2017– 2018	Randomly	Mohammadi et al., 2019 **
Karun	Khuzestan	80	257	222	101	91	26	67	54	41	29	32.5	26.1	24.3	40.6	31.9	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b **
Semnan	Semnan	557	557	148	62	62	32	32	5	3	3	5.7	5.7	3.4	4.8	4.8	8	767	Both	Local	Mar 2018– May 2018	Randomly	Shirzadi et al., 2020 **

Table 5. Continuation

Countries	Provinces	FS (IN)										Sampling					References						
		E					I					Schools	Students	Gender	Location	Date		Selection					
		III	IV	V	VI	≥7	III	IV	V	VI	≥7								I (%)				
Ahvaz	Khuzestan	653	2148	1839	773	422	139	509	501	247	126	21.3	23.7	27.2	32.0	29.9	–	5930	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaci, 2021**
Tabriz	East Azerbaijan	1464	1350	182	–	–	43	69	17	–	–	2.9	5.1	9.3	–	–	33	3032	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
Gilan-e Gharb	Kermanshah	599	1341	472	103	103	4	16	26	18	18	0.67	1.2	5.5	17.5	17.5	–	2515	Both	Local	2018	Overall	Zahirmia et al., 2021**
Paveh	Kermanshah	94	163	90	11	3	6	11	7	2	0	6.4	6.7	7.8	18.2	0	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghaghi, 2022
Marivan	Kurdistan	–	–	367	78	5	–	–	82	25	0	–	–	22.3	32.1	0	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022

Notes. E – examined, FS – family size, I – infested, IN – infested, IN – individuals. **Cited in Nasirian, 2023b.

Table 6. The impact of father's and mother's education and bathing and hair washing frequency on *P. capitis* infestation level in primary school students, based on a literature search

Counties	Provinces	E				I				I (%)				Sampling				References		
		IL	PS	SS	UE	IL	PS	SS	UE	IL	PS	SE	UE	Schools	Students	Gender	Location		Date	Selection
Father's education level																				
Kashan	Isfahan	279	279	1707	—	11	11	6	—	3.9	3.9	0.35	—	8	1986	Males	Local	1997	Randomly	Deghani et al., 1999**
	Mazandaran	—	—	—	—	65	56	77	17	30.2	26.0	17.9	7.9	58	10991	Both	Local	1997–1998	Randomly	Motavalli Haghi et al., 1999**
Ilam	Ilam	247	206	182	23	24	9	3	0	10.1	4.6	1.6	0	6	658	Both	Local	Mar 97–Apr 98	Randomly	Gholamiparizad, Abedzadah, 2001**
	Kurdistan	394	460	162	179	117	94	17	7	29.6	20.4	10.4	3.9	18	1195	Both	Local	—	Randomly	Davari, Yaghmaei, 2005**
Kerman	Kerman	105	324	540	165	12	14	16	0	11.4	4.3	3.0	0	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
	Gilan	423	680	1352	294	35	36	52	6	8.3	5.3	3.8	2.0	—	2893	Both	Local	2002–2003	Randomly	Pourbaba et al., 2005**
Rasht	Gilan	991	2353	851	851	254	119	13	13	25.6	5.1	1.5	1.5	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
	Kurdistan	84	194	243	59	9	14	18	3	10.7	7.2	7.4	5.1	—	600	Females	Local	2005	Randomly	Yaghmaei et al., 2007**
Kerman	Kerman	—	10949	20915	7901	—	254	275	180	—	2.3	1.3	2.3	198	40586	Both	Local	Mar–Jun 2006	Overall	Motavali-Emami et al., 2008**
	Hamadan	—	482	282	136	—	10	2	0	—	2.1	0.71	0	18	900	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009**
Bahar	Khuzestan	90	168	412	140	20	17	43	9	22.2	10.1	10.4	6.4	—	810	Females	Local	Apr–Jun 2006	Randomly	Rafie et al., 2009**
	Hamadan	—	—	—	—	—	653	492	72	—	53.7	20.2	5.9	—	17722	Both	Local	Oct–Dec 2011	Overall	Moradi et al., 2012**
Sanandaj	Kurdistan	110	406	294	294	7	26	5	5	6.4	6.4	1.7	1.7	27	810	Females	Local	—	Randomly	Vahabi et al., 2012**
	Kermanshah	45	128	150	62	10	23	20	8	22.2	18.0	13.3	12.9	6	385	Females	Local	—	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	97	366	287	287	16	28	16	16	16.5	7.7	5.6	5.6	25	750	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**

Table 6. Continuation

Counties	Provinces	E				I				I (%)				Sampling				References		
		IL	PS	SS	UE	IL	PS	SS	UE	IL	PS	SE	UE	Schools	Students	Gender	Location		Date	Selection
Aran va Bidgol	Isfahan	–	–	–	–	–	–	–	–	–	–	–	–	19	3589	Both	Local	Oct–Dec 2008	Randomly	Doroodgar et al., 2014**
	Mazandaran	136	3356	1220	1220	4	60	14	14	2.9	1.8	1.1	1.1	–	4712	Both	Local	2012–2013	Randomly	Motevalli Haghi et al., 2014b**
Bayangan	Kermanshah	44	124	162	54	9	24	16	5	20.5	19.4	9.9	9.3	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014**
Sarab	East Azerbaijan	25	356	187	93	–	–	–	–	12.0	7.9	3.2	0	40	661	Both	Local	Aug 2013–Mar 2014	Randomly	Dehghanzadeh et al., 2015**
Bonab	East Azerbaijan	96	2686	973	973	9	87	10	10	9.4	3.2	1.0	1.0	–	3757	Females	Local	2013–2014	Overall	Kabiri et al., 2015**
Bojnurd	North Khorasan	76	333	699	345	9	44	47	9	11.8	13.2	6.7	2.6	75	1475	Both	Local	Jan–Mar 2013	Randomly	Rajabzade et al., 2015**
Savojbolagh	Alborz	–	238	238	238	–	175	45	18	–	73.5	19.0	7.5	–	12782	Both	Local	Sep–Dec 2013	Overall	Bahrani et al., 2016**
Kalaleh	Golestan	94	234	119	94	9	10	9	7	9.6	4.3	7.6	7.4	4	541	Both	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016**
Paveh	Kermanshah	62	153	189	81	18	31	30	6	29.0	20.3	15.9	7.4	5	485	Females	Local	–	Overall	Sayyad et al., 2016**
Sirik	Hormozgan	59	128	121	–	–	–	–	–	82.4	58.7	21.0	–	–	358	Females	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017**
Meshginshahr	Ardabil	–	869	733	348	–	146	42	12	–	7.5	2.1	0.62	20	1950	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018**
Meshginshahr	Ardabil	–	869	733	348	–	146	42	12	–	16.8	5.7	3.4	20	1950	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018**
Meybod	Yazd	99	99	210	93	24	24	28	7	24.2	24.2	13.3	7.5	4	402	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**
Qom	Qom	172	906	–	647	44	140	–	45	25.6	15.5	–	7.0	75	1725	Females	Local	Mar 2015–Mar 2017	Randomly	Saghafipour et al., 2018**
Tonekabon	Mazandaran	15	253	435	761	–	–	–	–	33.3	35.2	19.8	14.6	–	1466	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Mashhad	Razavi Khorasan	287	1871	744	160	48	273	79	17	16.7	14.6	10.6	10.6	–	2645	Females	Local	2017–2018	Randomly	Mohammadi et al., 2019**

Karun	Khuzestan	131	334	186	88	39	118	41	18	29.8	35.3	22.0	20.5	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b**
Birjand	South Khorasan	107	486	1114	685	23	72	170	62	21.5	14.8	15.3	9.1	19	2417	Females	Local	2017	Randomly	Lashkari et al., 2020**
Semnan	Semnan	69	63	245	390	11	5	12	12	15.9	7.9	4.9	3.1	8	767	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020**
Khorramabad	Lovestan	–	233	1282	1238	–	14	68	40	–	6.0	5.3	3.2	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	2356	1577	1311	480	769	336	254	143	32.6	21.3	19.4	29.8	–	5930	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaci, 2021**
Tabriz	East Azerbaijan	–	42	1857	1133	–	2	74	54	–	4.8	4.0	4.8	33	3032	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
Gilan-e Gharb	Kermanshah	193	410	1169	743	20	17	23	5	10.4	4.1	2.0	0.67	–	2515	Both	Local	2018	Overall	Zahirmia et al., 2021**
Paveh	Kermanshah	4	29	216	112	1	2	17	6	25.0	6.9	7.9	5.4	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghaghi, 2022
Gahavand	Hamadan	–	88	301	110	–	23	53	13	–	26.1	17.6	11.8	–	499	Females	Local	2020	Overall	Hajiloie et al., 2022**
Marivan	Kurdistan	47	121	214	72	17	28	50	12	36.2	23.1	23.4	16.7	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
Varzaqan	East Azerbaijan	10	87	387	16	1	8	31	1	10.0	9.2	8.0	6.3	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022
Gotvand	Khuzestan	–	–	–	–	4	83	125	92	1.3	27.3	41.1	30.3	–	304	Females	Local	–	Randomly	Zahirmia et al., 2024
Mother's education level																				
Kashan	Isfahan	332	332	1654	–	12	12	5	–	3.6	3.6	0.3	–	8	1986	Males	Local	1997	Randomly	Dehghani et al., 1999**
Sari	Mazandaran	–	–	–	–	82	43	71	19	38.1	20.0	16.5	8.8	58	10991	Both	Local	1997–1998	Randomly	Motavalli Haghi et al., 1999**
Ilam	Ilam	336	213	101	8	26	8	2	0	7.8	3.8	2.0	0	6	658	Both	Local	Mar 97–Apr 98	Randomly	Gholamiparizad, Abedzadah, 2001**

Table 6. *Continuation*

Counties	Provinces	E				I				I (%)				Sampling				References		
		IL	PS	SS	UE	IL	PS	SS	UE	IL	PS	SS	UE	Schools	Students	Gender	Location		Date	Selection
Sanandaj	Kurdistan	653	352	87	103	183	47	4	1	28.0	13.0	5.0	0.9	18	1195	Both	Local	–	Randomly	Davari, Yaghmaei, 2005**
Kerman	Kerman	126	345	573	106	9	23	9	0	7.1	6.7	1.6	0	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
Rasht	Gilan	882	829	1004	140	70	23	33	3	7.9	2.8	3.3	2.1	–	2893	Both	Local	2002–2003	Randomly	Pourbaba et al., 2005**
Amlash	Gilan	1562	2102	558	558	300	85	3	3	19.2	4.0	0.54	0.54	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Sanandaj	Kurdistan	146	203	85	121	19	14	4	8	13.0	6.9	4.7	6.6	–	600	Females	Local	2005	Randomly	Yaghmaei et al., 2007**
Kerman	Kerman	–	21159	15041	4129	–	493	218	8	–	2.3	1.4	0.19	198	40586	Both	Local	Mar–Jun 2006	Overall	Motavali-Emami et al., 2008**
Bahar	Hamadan	–	741	146	13	–	11	1	0	–	1.5	0.68	0	18	900	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009**
Ahvaz	Khuzestan	156	227	331	86	34	25	22	8	21.8	11.0	6.6	9.3	–	810	Females	Local	Apr–Jun 2006	Randomly	Rafie et al., 2009**
Bahar	Hamadan	–	–	–	–	–	747	453	17	–	61.4	37.2	1.4	–	17722	Both	Local	Oct–Dec 2011	Overall	Moradi et al., 2012**
Sanandaj	Kurdistan	185	446	179	179	14	22	2	2	7.6	4.9	1.1	1.1	27	810	Females	Local	–	Randomly	Vahabi et al., 2012**
Ravansar	Kermanshah	94	143	44	104	35	14	3	7	37.2	9.8	6.8	6.7	6	385	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	167	417	166	166	23	31	6	6	13.8	7.4	3.6	3.6	25	750	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Aran va Bidgol	Isfahan	388	1690	528	983	5	10	0	2	1.3	0.6	0	0.2	19	3589	Both	Local	Oct–Dec 2008	Randomly	Doroodgar et al., 2014a**
Sari	Mazandaran	237	3390	1085	1085	5	54	19	19	2.1	1.6	1.8	1.8	–	4712	Both	Local	2012–2013	Randomly	Motavalli Haghi et al., 2014b**
Bayangan	Kermanshah	84	153	125	22	20	24	9	1	23.8	15.7	7.2	4.5	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014**
Sarab	East Azerbaijan	55	364	180	62	–	–	–	–	21.8	6.0	1.7	0	40	661	Both	Local	Aug 2013–Mar 2014	Randomly	Dehghanzadeh et al., 2015**

Bonab	East Azerbaijan	108	2774	875	875	16	78	12	12	14.8	2.8	1.4	1.4	–	3757	Females	Local	2013–2014	Overall	Kabiri et al., 2015**
Bojnurd	North Khorasan	168	398	614	295	29	43	35	7	17.3	10.8	5.7	2.4	75	1475	Both	Local	Jan–Mar 2013	Randomly	Rajabzade et al., 2015**
Savojbolagh	Alborz	–	238	238	238	–	190	35	13	–	79.8	14.7	5.5	–	12782	Both	Local	Sep–Dec 2013	Overall	Bahrani et al., 2016**
Khorramshahr	Khuzestan	–	–	–	–	–	–	–	–	3.1	2.0	1.7	1.3	10	750	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016**
Kalaleh	Golestan	169	239	85	48	14	12	3	6	8.3	5.0	3.5	12.5	4	541	Both	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016**
Paveh	Kermanshah	102	191	157	35	31	35	15	4	30.4	18.3	9.6	11.4	5	485	Females	Local	–	Overall	Sayyad et al., 2016**
Sirik	Hormozgan	57	171	99	31	–	–	–	–	73.7	64.9	40.4	25.8	–	358	Females	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017**
Meshginshahr	Ardabil	–	855	792	303	–	162	28	10	–	8.3	1.4	0.52	20	1950	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018**
Yazd	Yazd	–	237	169	237	–	11	5	1	–	4.6	3.0	0.4	30	650	Both	Local	Oct–Mar 2013	Randomly	Ebrahimzadeh Ardakani, Fayazi Bargin, 2018**
Meshginshahr	Ardabil	–	855	792	303	–	162	28	10	–	18.9	3.5	3.3	20	1950	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018**
Meybod	Yazd	113	113	206	83	29	29	22	8	25.7	25.7	10.7	9.6	4	402	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**
Qom	Qom	210	1027	–	488	51	149	–	29	24.3	14.5	–	5.9	75	1725	Females	Local	Mar 2015–Mar 2017	Randomly	Saghafipour et al., 2018**
Tonekabon	Mazandaran	26	231	395	814	17	69	73	133	65.4	29.9	18.5	16.3	–	1466	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Mashhad	Razavi Khorasan	299	1863	734	130	62	282	54	19	20.7	15.1	7.4	14.6	–	2645	Females	Local	2017–2018	Randomly	Mohammadi et al., 2019**
Karun	Khuzestan	185	383	141	35	55	121	36	3	29.7	31.6	25.5	8.6	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020**
Birjand	South Khorasan	124	699	748	574	27	112	135	53	21.8	16.0	18.0	9.2	19	2417	Females	Local	2017	Randomly	Lashkari et al., 2020**
Semnan	Semnan	74	76	306	311	9	7	13	11	12.2	9.2	4.2	3.5	8	767	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020**

Qom	Qom	–	512	1136	77	–	103	119	7	–	20.1	10.5	9.1	75	1725	Females	Local	Mar 2015– Mar 2017	Randomly	Saghafipour et al., 2018**
Tonekabon	Mazandaran	–	389	427	650	–	94	82	116	–	24.2	19.0	17.8	–	1466	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Tabriz	East Azerbaijan	–	1311	1059	662	–	57	47	26	–	4.3	4.4	3.9	33	3032	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
Hair washing frequency		E	OTW	TW	≥ 3	OTW	OW	TW	≥ 3	OTW	I (%)									
Bahar	Hamadan	543	543	357	–	7	7	5	–	1.3	1.3	1.3	1.4	–	900	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009**
Khajeh	East Azerbaijan	150	297	–	–	13	11	–	–	8.7	3.7	–	–	20	500	Both	Local	2008–2009	Randomly	Shayeghi et al., 2010**
Sanandaj	Kurdistan	–	278	365	167	–	14	18	6	–	5.0	4.9	3.6	27	810	Females	Local	–	Randomly	Vahabi et al., 2012**
Ravansar	Kermanshah	–	122	183	80	–	25	30	6	–	20.5	16.4	7.5	6	385	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	–	254	345	151	–	27	24	9	–	10.6	7.0	6.0	25	750	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Bayegan	Kermanshah	–	118	182	84	–	25	22	7	–	21.2	12.1	8.3	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014**
Savojbolagh	Alborz	–	3707	6902	2137	–	133	86	19	–	3.6	1.3	0.87	–	12782	Both	Local	Sep–Dec 2013	Overall	Bahrani et al., 2016**
Galugah	Mazandaran	–	92	208	208	–	9	8	8	–	9.8	3.8	3.8	16	300	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016**
Khorramshahr	Khuzestan	–	–	–	–	–	–	–	–	–	43.5	0.7	–	10	750	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016**
Paveh	Kermanshah	–	175	215	95	–	41	31	13	–	23.4	14.4	13.7	5	485	Females	Local	–	Overall	Sayyad et al., 2016**
Bashagard	Hormozgan	–	211	78	11	–	–	–	–	–	72.9	56.4	27.2	–	300	Females	Local	–	Randomly	Soleimani-Ahmadi et al., 2017**

N notes. E – examined, I – infested, IL – illiterate, PS – primary schools, SS – secondary schools, UE – university education, OTW – once two weeks, OW – once a week, TW – twice a week. **Cited in Nasirian, 2023b.

The data and variables about *P. capitis* infestation in private and public in rural and urban areas, the impact of the existence of bathing facilities in student residences and health instructor involvement in student schools, history of infestation, and sharing equipment on *P. capitis* infestation level in students of primary schools (extracted from 55 articles) are summarized in Table 7. The data and variables for the impact of age and education, family income, and hair length and style on *P. capitis* infestation level of primary school students (extracted from 59 articles) are summarized in Table 8. Overall, a total of 155 articles were used, of which 126 were used in data extraction, and 29 were used for discussion, interpretation, and body text.

Statistical analysis

The location of provinces (Fig. 1a), the meridians 50°E, 55°E, and 60°E, and the tropics 30°N and 35°N (Fig. 1d), and the geographic (Fig. 1b, 1c) and climatic regions of Iran were taken into account for any statistical analysis. The climatic regions of Iran include moderate and humid climatic region (the southern shores of the Caspian Sea), cold climatic region (the Western mountains), semidesert and temperate climatic region, hot and dry climatic region (the central plateau), and hot and humid climatic region (the south coast). The median and interquartile range (IQR) were reported from descriptive statistics. The Kruskal-Wallis test was used to compare infestation rates (Table 9). The trends were designed based on the means of infestation each year (Figs 1–4). The trends of *P. capitis* infestation in the provinces (Fig. 2), the geographic and climatic regions (Fig. 3), seasons, and the meridians 50°E, 55°E and 60°E and the tropics 30°N and 35°N (Fig. 4) of Iran were designed. The distribution and stratification of the *P. capitis* infestation in Iran were provided based on the regression coefficient (Fig. 5). Interaction modeling with multivariable Poisson regression was conducted for the interaction time trends of the categorical variables with enough observations (Table 10). All the analyses were performed by R programming version 4.3.2 (R Foundation for Statistical Computing, Austria). The trends were shown on the geographical map of Iran using ArcMap 10.8.2 (Esri Inc., US).

RESULTS

The trends of *P. capitis* infestation in provinces

The trends of *P. capitis* infestation in 14 provinces out of 31 provinces including Ardebil (Fig. 2Aa), Bushehr (Fig. 2Ab), Fars (Fig. 2Ac), Gilan (Fig. 2Ad), Golestan (Fig. 2Ae), Hamadan (Fig. 2Af), Hormozgan (Fig. 2Ag), Kerman (Fig. 2Ah), Kohgiluyeh and Boyer-Ahmad (Fig. 2Ai), Lorestan (Fig. 2Aj), Semnan (Fig. 2Ak), Sistan and Baluchestan (Fig. 2Al), South Khorasan (Fig. 2Am), and Yazd (Fig. 2An) have increased over the last two decades. The trend of *P. capitis* infestation in Razavi Khorasan province has stayed the same over the previous two decades (Fig. 2Ao). The trends of *P. capitis* infestation in 16 provinces including Alborz (Fig. 2Ba), Chaharmahal and Bakhtiari (Fig. 2Bb), East Azerbaijan (Fig. 2Bc), Ilam (Fig. 2Bd), Isfahan (Fig. 2Be), Kermanshah (Fig. 2Bf), Khuzestan (Fig. 2Bg), Kurdistan (Fig. 2Bh), Markazi (Fig. 2Bi), Mazandaran (Fig. 2Bj), North Khorasan (Fig. 2Bk), Qazvin (Fig. 2Bl), Qom (Fig. 2Bm), Tehran (Fig. 2Bn), West Azerbaijan (Fig. 2Bo), and Zanjan (Fig. 2Bp) have decreased over the last two decades.

The trends of *P. capitis* infestation in the geographic and climatic regions

The trends of *P. capitis* infestation in geographic regions one (Fig. 3a), two (Fig. 3b), and five (Fig. 3e) have increased over the last two decades. The trends of *P. capitis* infestation in geographic regions three (Fig. 3c) and four (Fig. 3d) have decreased over the previous two decades. The trends of *P. capitis* infestation in moderate and humid (the southern shores of the Caspian Sea) (Fig. 3g), hot and dry (the central plateau) (Fig. 3j), and hot and humid (the south coast) (Fig. 3k) climatic regions have increased over the

last two decades. The trend of *P. capitis* infestation in semidesert and temperate climatic region has stayed the same over the previous two decades (Fig. 3i). The trend of *P. capitis* infestation in the cold (the western mountains) climatic region has decreased over the last two decades (Fig. 3h). The trend of *P. capitis* infestation overall has increased over the previous two decades (Fig. 3f).

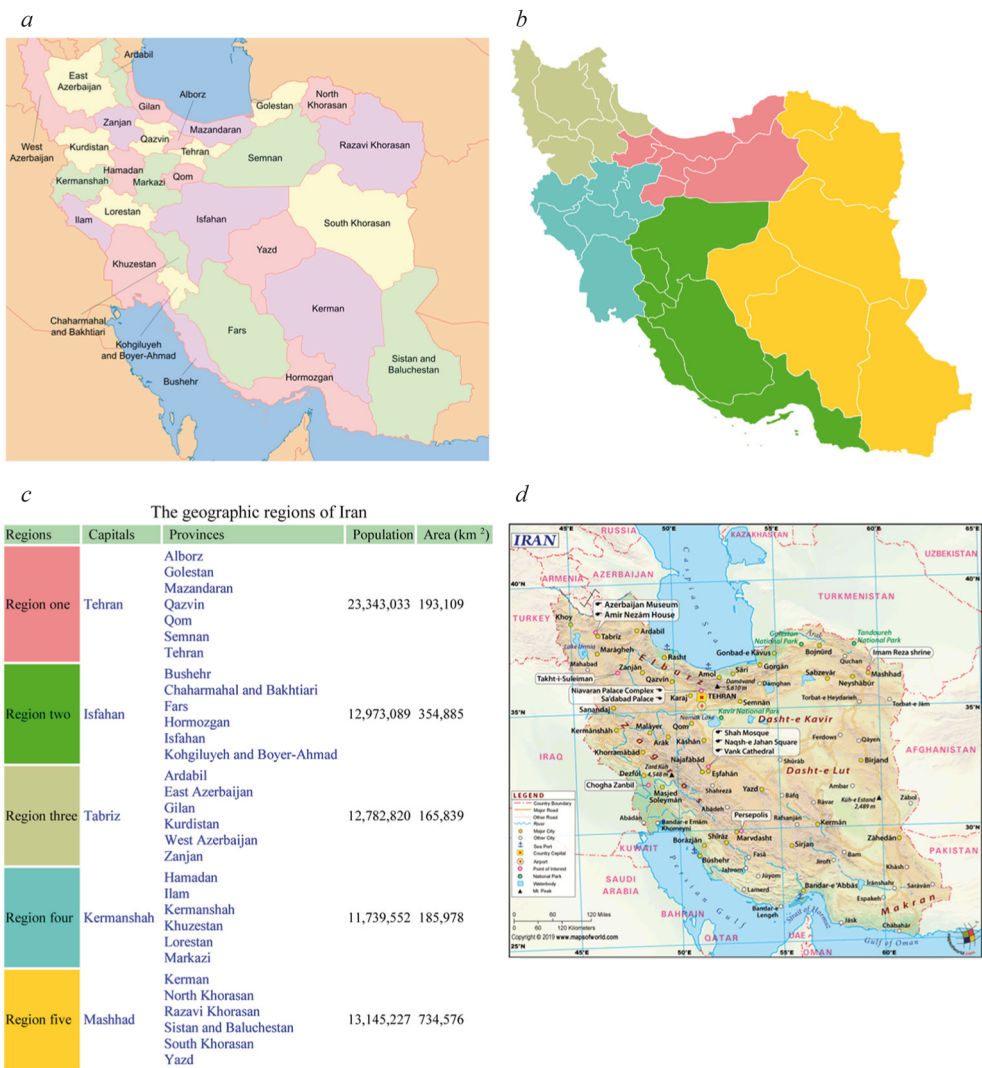


Figure 1. *a* – Map of the territory of the 31 provinces of Iran (source: https://en.wikipedia.org/wiki/Provinces_of_Iran). *b* – the map of geographic regions of Iran. *c* – the geographic regions of Iran (source: https://en.wikipedia.org/wiki/Regions_of_Iran). *d* – location of the meridians 50°E, 55°E and 60°E, and the tropics 30°N and 35°N in Iran (source: <https://www.mapsofworld.com/iran/>) (Beck et al., 2018).

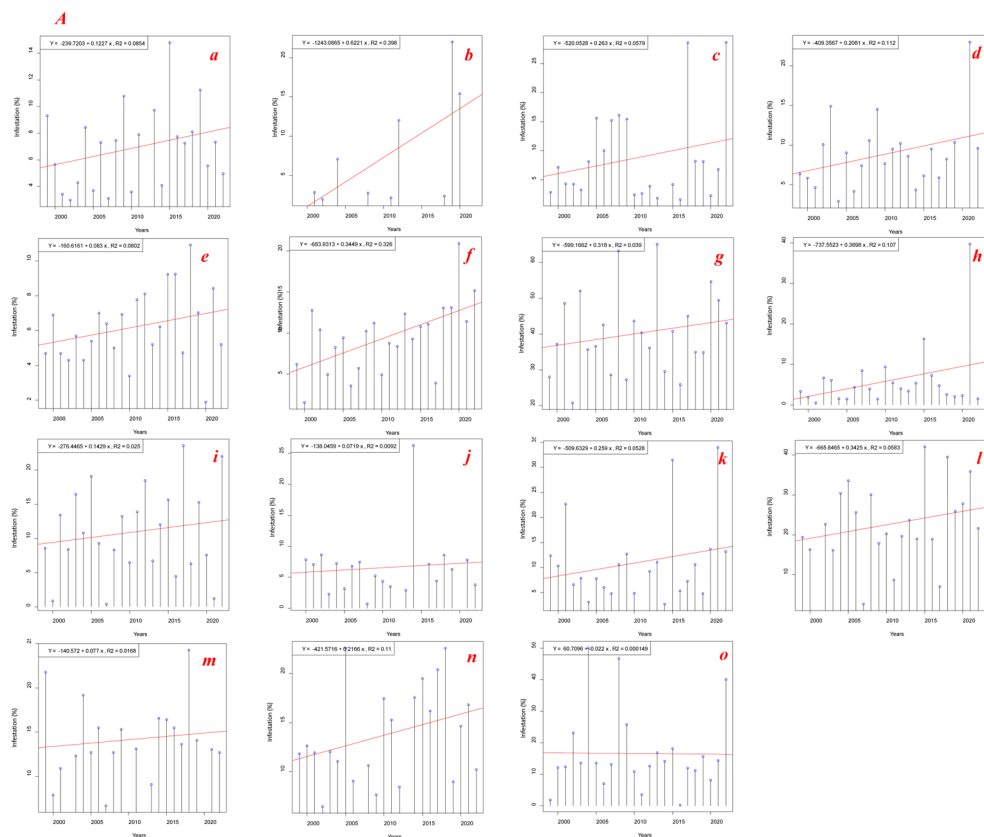


Figure 2. *A.* The trends of *P. capitis* infestation in the provinces of Iran: *a* – Ardabil, *b* – Bushehr, *c* – Fars, *d* – Gilan, *e* – Golestan, *f* – Hamadan, *g* – Hormozgan, *h* – Kerman, *i* – Kohgiluyeh and Boyer-Ahmad, *j* – Lorestan, *k* – Semnan, *l* – Sistan and Baluchestan, *m* – South Khorasan, *n* – Yazd, *o* – Razavi Khorasan.

The trends of *P. capitis* infestation during seasons and in the meridians and the tropics

Infestation trends of *P. capitis* in spring (Fig. 4*a*), summer (Fig. 4*b*), winter (Fig. 4*d*), and along the meridian 50°E (Fig. 4*e*) have decreased over the last two decades. The trends of *P. capitis* infestation in autumn (Fig. 4*c*), along the meridians 55°E (Fig. 4*f*) and 60°E (Fig. 4*g*), and the tropics 30°N (Fig. 4*h*) and 35°N (Fig. 4*i*) have increased over the last two decades.

The distribution and stratification of the *P. capitis* infestation

Based on the regression coefficient, the distribution and stratification of the *P. capitis* infestation in Iran are as follows: $-\infty-0.40$, $-0.40-0.20$, $-0.20-0.00$, $0.00-0.20$, $0.20-0.40$, and $0.40+\infty$ (Fig. 5).

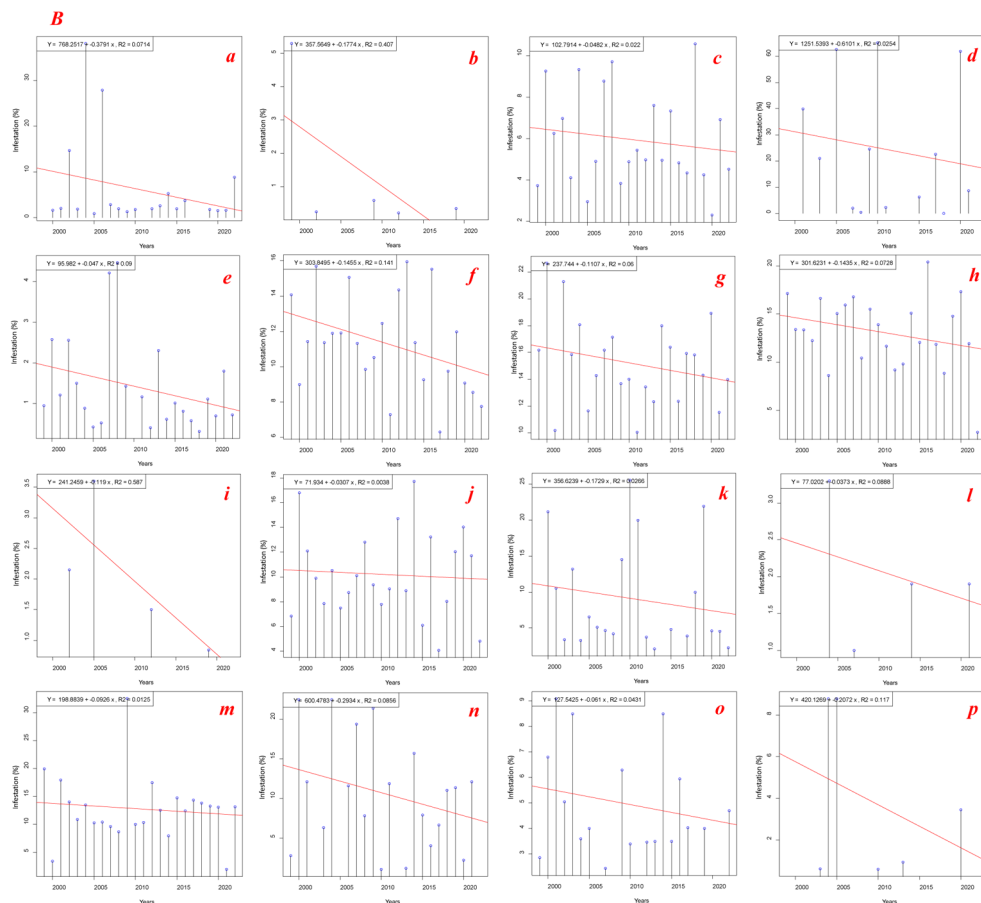


Figure 2. *B.* The trends of *P. capitis* infestation in the provinces of Iran: *a* – Alborz, *b* – Chaharmahal and Bakhtiari, *c* – East Azerbaijan, *d* – Ilam, *e* – Isfahan, *f* – Kermanshah, *g* – Khuzestan, *h* – Kurdistan, *i* – Markazi, *j* – Mazandaran, *k* – North Khorasan, *l* – Qazvin, *m* – Qom, *n* – Tehran, *o* – West Azerbaijan, *p* – Zanjan.

Statistical analysis of *P. capitis* infestation and comparison of factor impacts on *P. capitis* infestation level

The Kruskal-Wallis test showed a significant difference between *P. capitis* infestation in climatic regions, community targets, gender, population, provinces, regions, and years ($P_c < 0.05$). There was a significant difference between the factors of the father's and mother's education levels on *P. capitis* infestation levels ($P_c < 0.05$) (Table 9). Interaction modeling with Poisson regression showed a significant difference between *P. capitis* infestation in the primary school population and climatic regions ($P < 0.05$) (Table 10).

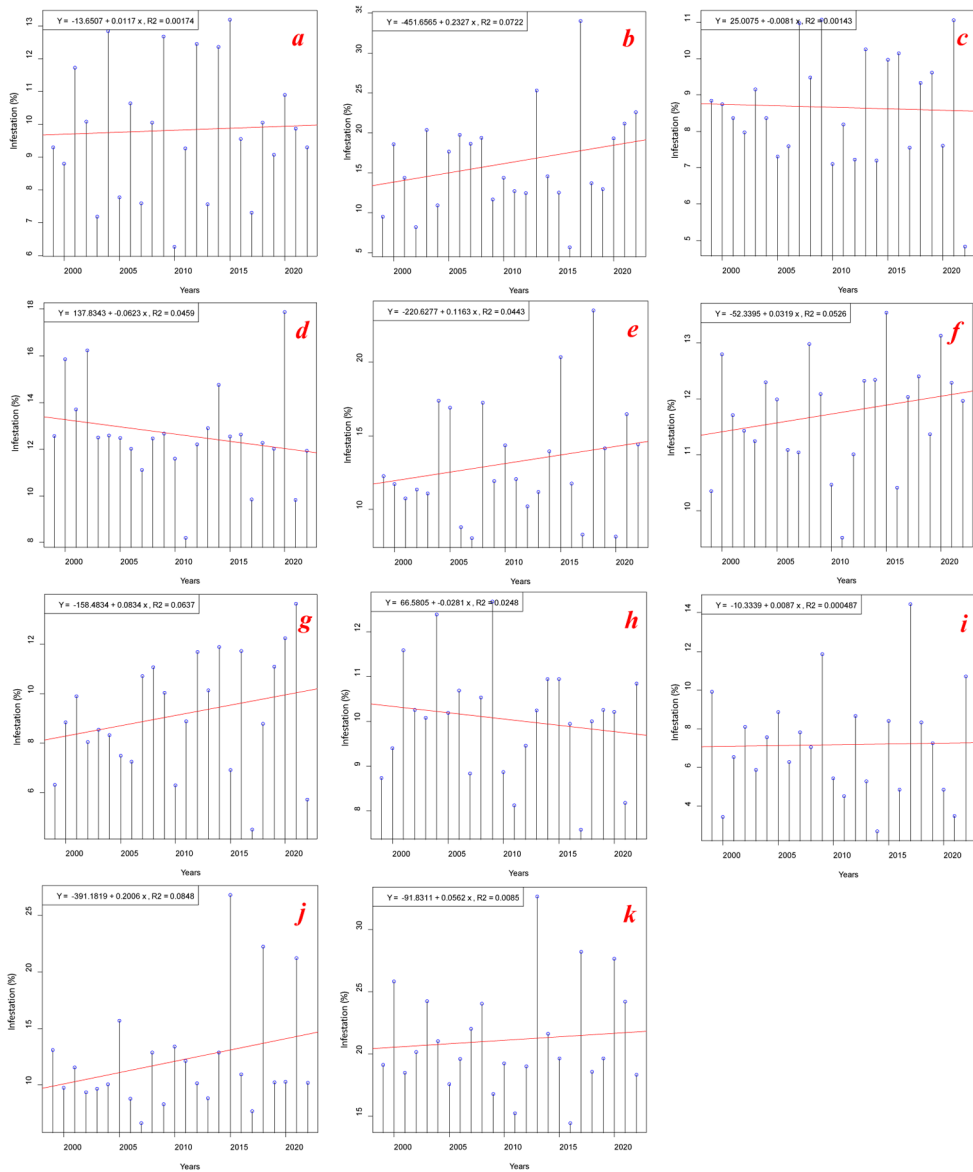


Figure 3. The trends of *P. capitis* infestation in the geographic and climatic regions of Iran based on Fig. 1: *a* – the geographic region one, *b* – the geographic region two, *c* – the geographic region three, *d* – the geographic region four, *e* – the geographic region five, *f* – overall, *g* – the moderate and humid climatic region (the southern shores of the Caspian Sea), *h* – the cold climatic region (the western mountains), *i* – the semidesert and temperate climatic region, *j* – the hot and dry climatic region (the central plateau), *k* – the hot and humid climatic region (the south coast).

Interaction modeling with Poisson regression

The interactions of time trends with gender, population, and climatic region were investigated. Accordingly, the interaction of time trends with the primary school population was statistically significant and increased by 1.00013 times the incidence of infestation. Regarding climatic regions, semidesert and temperate region showed a statistically significant interaction that decreased 0.9999 times the incidence of infestation, while the other interactions of time trends with climatic regions were increasing. Gender groups did not significantly interact with the time trend (Table 10).

DISCUSSION

The trends of *P. capitis* infestation have increased in about half of the country's provinces over the previous two decades (Fig. 2A). Although these provinces are scattered throughout all geographic regions, they are mostly in one, two, and five geographic areas (Fig. 1a, 1b and 1c). That is why the trends of *P. capitis* infestation in geographic regions one (Fig. 3a),

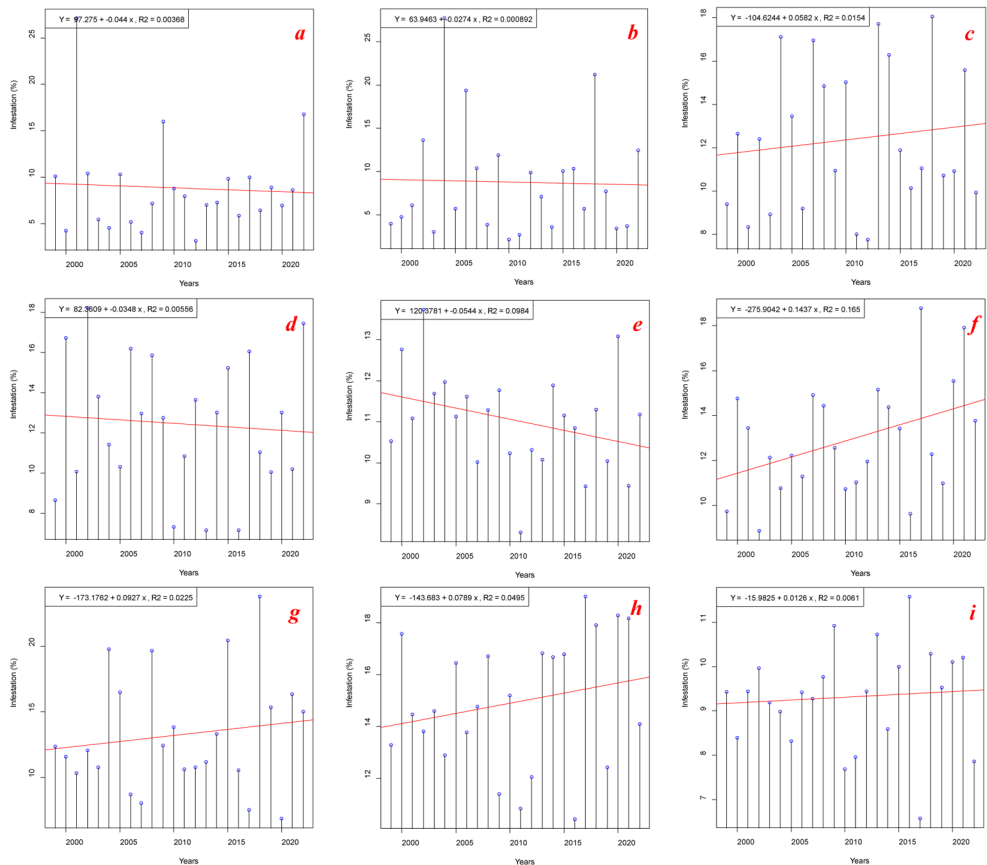


Figure 4. The trends of *P. capitis* infestation during seasons and in the meridians 50°E, 55°E and 60°E, and the tropics 30°N and 35°N: *a* – spring, *b* – summer, *c* – autumn, *d* – winter, *e* – the meridian 50°E, *f* – the meridian 55°E, *g* – the meridian 60°E, *h* – the tropic 30°N, *i* – the tropic 35°N.

two (Fig. 3b), and five (Fig. 3e) have increased. These provinces are mostly located in the climatic regions of moderate and humid (the southern shores of the Caspian Sea), hot and dry (the central plateau), and hot and humid (the south coast) (Fig. 1e). For this reason, it is predictable that the trends of *P. capitis* infestation in moderate and humid (the southern shores of the Caspian Sea) (Fig. 3g), hot and dry (the central plateau) (Fig. 3j), and hot and humid (the south coast) (Fig. 3k) climatic regions will increase over the last two decades. Regarding the distribution and stratification of the *P. capitis* infestation, they are in the range of 0.00–0.20, 0.20–0.40, and 0.40– $+\infty$ in the regression coefficient (Fig. 5).

The trends of *P. capitis* infestation have decreased in about half of the country's provinces over the previous two decades (Fig. 2B). Although these provinces are scattered throughout all geographic regions, they are mostly in three and four geographic regions (Fig. 1a, 1b and 1c). That is why the trends of *P. capitis* infestation in geographic areas three (Fig. 3c) and four (Fig. 3d) have decreased. These provinces are mostly located in the cold climatic region (the western mountains) (Fig. 1e). For this reason, it is predictable that the trend of *P. capitis* infestation in the cold (the Western mountains) climatic region will decrease over the last two decades (Fig. 3h). Regarding the distribution and stratification of the *P. capitis* infestation, they are in the range of $-\infty$ –0.40, -0.40–0.20, and -0.20–0.00 in the regression coefficient (Fig. 5).

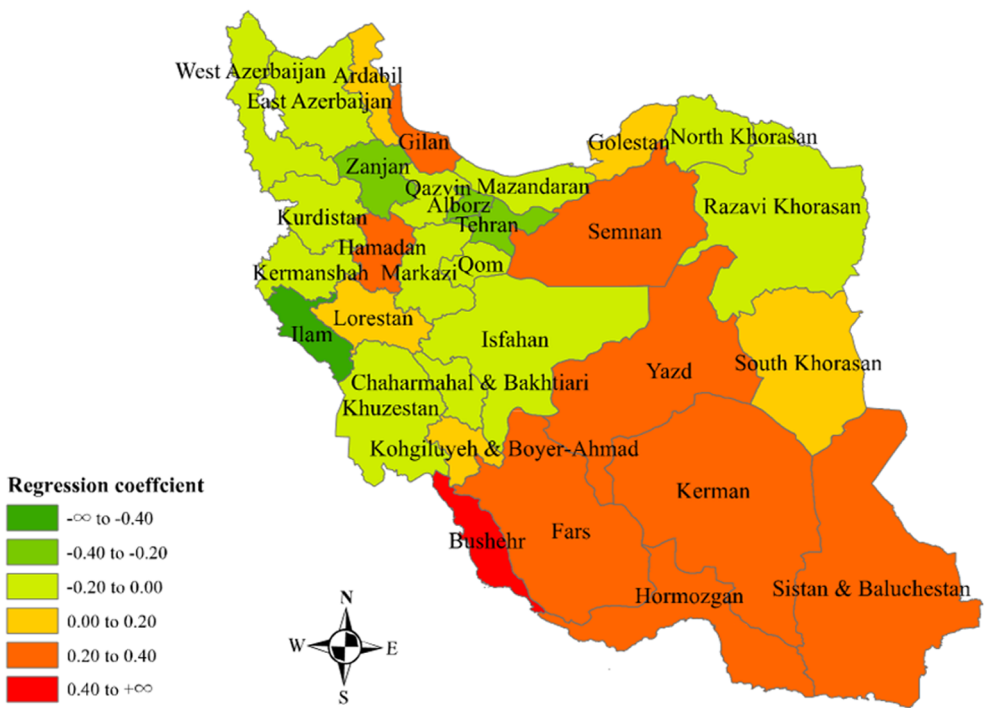


Figure 5. The distribution and stratification of the *P. capitis* infestation in Iran based on the regression coefficient

Table 7. *Pediculus capitis* infestation in private and public among rural and urban areas, and the impact of the existence of bathing facilities in student residences (BFE) and health instructor involvement in student schools (HII), history of infestation (HI), and sharing equipment (SE) on *P. capitis* infestation level in primary school students, based on a literature search

Counties	Provinces	E		I		I (%)		E		I		I (%)		Schools		Students		Gender	Location	Date	Selection	References
		Private	Public	Private	Public	Private	Public	R	U	R	U	R	U	U	U							
Sari	Mazandaran	–	–	–	–	–	–	3183	7808	118	97	3.7	1.2	58	10991	10991	10991	Both	Local	1997–1998	Randomly	Motevalli Haghi et al., 1999*
	Gilan	–	–	–	–	–	–	1446	1447	83	46	5.7	3.2	–	2893	2893	2893	Both	Local	2002–2003	Randomly	Pourbaba et al., 2005*
Amlash	Gilan	138	4106	1	391	0.72	9.5	2413	1837	368	30	15.3	1.6	95	4244	4244	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006*
Kerman	Kerman	–	–	–	–	–	–	3915	36671	182	539	4.6	1.5	198	40586	40586	40586	Both	Local	Mar–Jun 2006	Overall	Motavali-Emami et al., 2008*
Shiraz	Fars	–	–	–	–	–	–	67219	46609	487	74	0.72	0.16	–	113828	113828	113828	Both	Local	Oct–Dec 2005	Overall	Davarpanah et al., 2009*
Shiraz	Fars	–	–	–	–	–	–	85361	50657	395	107	0.46	0.21	–	136018	136018	136018	Both	Local	Jan–Mar 2005	Overall	Davarpanah et al., 2009*
Shiraz	Fars	–	–	–	–	–	–	58728	39636	142	53	0.24	0.13	–	98364	98364	98364	Both	Local	Apr–Jun 2006	Overall	Davarpanah et al., 2009*
Bahar	Hamadan	–	–	–	–	–	–	600	300	10	2	1.7	0.67	18	900	900	900	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009*
Across	Iran	14320	198947	213267	–	–	–	–	–	–	–	62.0	38.0	–	213450	213450	213450	Both	Across	2005	Overall	Amirkhani et al., 2011*
Bahar	Hamadan	–	–	–	–	–	–	9238	8484	472	722	5.1	8.5	–	17722	17722	17722	Both	Local	Oct–Dec 2011	Overall	Moradi et al., 2012*
Mashhad	Razavi Khorasan	–	–	–	–	–	–	–	–	141	219	36.4	63.6	–	55997	55997	55997	Both	Local	Mar 2006–Feb 2010	Overall	Ramezani Awal Riabi, Atarodi, 2012*

Table 7. Continuation

Counties	Provinces	E		I		I (%)		E		I		I (%)		Sampling				References			
		Private	Public	Private	Public	Private	Public	R	U	R	U	R	U	Schools	Students	Gender	Location		Date	Selection	
Shiraz	Fars	–	–	–	–	–	–	41144	31216	98	69	0.24	0.22	–	72360	Both	Local	Local	Oct–Dec 2005	Overall	Davarpanah et al., 2013*
Shiraz	Fars	–	–	–	–	–	–	52663	37973	151	97	0.29	0.26	–	90636	Both	Local	Local	Jan–Mar 2005	Overall	Davarpanah et al., 2013*
Shiraz	Fars	–	–	–	–	–	–	43020	23626	72	5	0.17	0.02	–	66646	Both	Local	Local	Apr–Jun 2006	Overall	Davarpanah et al., 2013*
Hamadan	Hamadan	–	–	–	–	–	–	2005	8836	1	113	0.05	1.3	–	10841	Both	Local	Local	Oct–Dec 2010	Randomly	Omidi et al., 2013*
Paveh	Kermanshah	400	187	30	13	7.5	7.0	–	–	–	–	–	–	25	750	F	Local	Local	2009–2010	Randomly	Vahabi et al., 2013*
Damghan	Semnan	–	–	–	–	–	–	–	–	33	64	34.0	66.0	–	2700	F	Local	Local	2008	Overall	Mohammadi Azni, 2014*
Sari	Mazandaran	–	–	–	–	–	–	1221	3491	21	57	1.7	1.6	–	4712	Both	Local	Local	2012–2013	Randomly	Motevalli Haghi et al., 2014b*
Pakdasht	Tehran	–	–	–	–	–	–	5756	47976	198	480	3.4	1.0	–	53732	Both	Local	Local	Oct–Dec 2013	Overall	Davari et al., 2015*
Sarab	East Azerbaijan	–	–	–	–	0	5.9	–	–	–	–	–	–	40	624	Both	Local	Local	Aug 2013–Mar 2014	Randomly	Dehghanzadeh et al., 2015*
Savojbolagh	Alborz	–	–	–	–	–	–	4933	7849	106	132	2.2	1.7	–	12782	Both	Local	Local	Sep–Dec 2013	Overall	Bahrami et al., 2016*
Galugah	Mazandaran	–	–	–	–	–	–	145	155	5	12	3.4	7.7	16	300	Both	Local	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016*
Kalaleh	Golestan	–	–	–	–	–	–	301	240	23	12	7.6	5.0	4	541	Both	Local	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016*
Sirik	Hormozgan	–	–	–	–	–	–	175	183	–	–	62.3	50.3	–	358	F	Local	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017*

Table 7. Continuation

Counties	Provinces	E		I		I (%)		E		I		I (%)		Sampling				Reference		
		Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	Schools	Students	Gender	Location	Date	Selection			
Khorramabad	Lorestan	547	3343	4	144	0.73	4.3	–	–	–	–	–	–	–	Local	2018–2019	Randomly	Galehdar et al., 2021		
		894	4757	165	1334	18.5	28.0	640	5290	236	1326	36.9	25.1	–	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaei, 2021*		
Tabriz	East Azerbaijan	1805	1227	100	30	5.5	2.4	–	–	–	–	–	–	33	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021*		
Counties	Provinces	E		I		I (%)		E		I		I (%)		Sampling				References		
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Schools	Students	Gender	Location	Date	Selection			
Ilam	Ilam	36	622	19	541	3.4	96.6	–	–	–	–	–	–	6	658	Both	Local	Mar 97–Apr 98	Randomly	Gholamparizad, Abedzadah, 2001**
Kerman	Kerman	1106	94	31	14	2.8	14.9	–	–	–	–	–	–	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
Amlash	Gilan	–	–	–	–	–	–	1712	2532	12	380	0.7	15.0	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Kerman	Kerman	7169	33417	101	620	1.4	1.9	–	–	–	–	–	–	198	40586	Both	Local	Mar–Jun 2006	Overall	Motovali–Emami et al., 2008**
Sanandaj	Kurdistan	–	–	–	–	–	–	749	61	34	4	4.5	6.6	27	810	Females	Local	–	Randomly	Vahabi et al., 2012**
Ravansar	Kermanshah	–	–	–	–	–	–	207	178	30	31	14.5	17.4	6	385	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	–	–	–	–	–	–	89	661	6	56	6.7	8.5	25	750	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Aran va Bidgol	Isfahan	3583	6	16	1	0.45	16.7	–	–	–	–	–	–	19	3 589	Both	Local	Oct–Dec 2008	Randomly	Doroodgar et al., 2014a**

Table 7. Continuation

Counties	Provinces	E		I		I (%)		E		I		I (%)		Sampling				Reference		
		Private	Public	Private	Public	Private	Public	R	U	R	U	R	U	Schools	Students	Gender	Location		Date	Selection
Karun	Khuzestan	658	93	170	47	25.8	50.5	155	596	30	187	19.4	31.4	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b**
Semnan	Semnan	–	–	–	–	–	–	145	622	6	34	4.1	5.5	8	767	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020**
Khorramabad	Lorestan	3836	54	144	7	3.8	13.0	3536	354	116	32	3.3	9.0	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	5793	137	1508	54	26.0	39.4	3477	2735	742	820	21.3	30.0	–	5930	Females	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaci, 2021**
Varzaqan	East Azerbaijan	385	15	35	6	9.1	40.0							26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022
SE																				
Kashan	Isfahan	–	–	–	–	–	–	140	1846	14	3	7.1	0.16	8	1986	Males	Local	1997	Randomly	Dehghani et al., 1999**
Hamadan	Hamadan	44	308	28	27	38.9	8.1	243	109	46	9	15.9	7.6	12	847	Both	Local	–	Overall	Nazari et al., 2006**
Amlash	Gilan	2227	294	182	210	8.2	71.4	–	–	–	–	–	–	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Kerman	Kerman	8513	32073	424	297	5.0	0.93	–	–	–	–	–	–	198	40586	Both	Local	Mar–Jun 2006	Overall	Motovali–Emami et al., 2008**
Sanandaj	Kurdistan	–	–	–	–	–	–	259	551	19	19	7.3	3.4	27	810	Females	Local	–	Randomly	Vahabi et al., 2012**
Ravansar	Kermanshah	–	–	–	–	–	–	122	263	28	33	23.0	12.5	6	385	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	–	–	–	–	–	–	254	496	29	31	11.4	6.3	25	750	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Maneh–Semelghan	North Khorasan	25	225	12	9	48.0	4.0	–	–	–	–	–	–	–	250	Both	Local	2013	Randomly	Hosseini et al., 2014**

Table 7. Continuation

Counties	Provinces	E		I		I (%)		E		I		I (%)		Sampling				Reference		
		Private	Public	Private	Public	Private	Public	R	U	R	U	R	U	Schools	Students	Gender	Location		Date	Selection
Tonekabon	Mazandaran	474	992	203	89	42.8	9.0	225	1241	85	207	37.2	16.7	–	1466	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Karun	Khuzestan	–	–	–	–	–	–	250	601	82	117	32.8	19.5	–	851	Females	Local	2017–2018	Randomly	Ghofleh Maramazi et al., 2019**
Karun	Khuzestan	255	496	120	97	47.1	19.6	253	498	131	86	51.8	17.3	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b**
Birjand	South Khorasan	422	1995	144	185	34.1	9.3	365	2052	70	259	19.2	12.6	19	2417	Females	Local	2017	Randomly	Lashkari et al., 2020**
Semnan	Semnan	–	–	–	–	–	–	443	324	26	14	5.9	4.3	8	767	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020**
Khorramabad	Lorestan	–	–	–	–	–	–	607	3283	46	102	7.6	3.1	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	1392	4538	785	777	56.4	17.1	1413	4517	805	757	57.0	16.8	–	5930	Females	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaei, 2021**
Varzaqan	East Azerbaijan	29	371	12	29	41.4	7.8	–	–	–	–	–	–	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022

Notes. E – examined, BFE – bathing facility existence in student residences, F – females; HI, history of infestation, HII – health instructor involvement in student schools, I – infested, M – males, R – rural, SE – sharing equipment, U – urban areas. *Cited in Nasirian, Ahmadi, 2024. **Cited in Nasirian, 2023b.

Table 8. The impact of age and education, family income, and hair length and style on *P. capitis* infestation level in primary school students, based on a literature search

Counties		Provinces	E			I			I (%)			Sampling				References			
Age (education level)			Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection	
6 years (first grade)																			
Ilanshahr	Kerman	Sistan and Baluchestan	–	35	–	–	–	3	–	–	8.6	–	12	–	Females	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003**
		Kerman	–	–	7412	–	–	298	–	–	4.0	–	198	7412	Both	Local	Mar–Jun 2006	Overall	Motovali–Emami et al., 2008**
Urmia	Sirik	West Azerbaijan	–	–	47	–	–	4	–	–	–	8.5	35	47	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012**
		Hormozgan	–	5	–	–	–	–	–	20.0	–	–	–	–	Females	Local	Nov 2015–Feb 2016	Randomly	Sanei–Dehkordi et al., 2017**
Karun	Ahvaz	Khuzestan	–	–	126	–	–	–	39	–	–	31.0	–	126	Both	Local	2017	Randomly	Kassiri et al., 2020b**
		Khuzestan	–	–	999	–	–	279	–	–	–	27.9	–	999	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaei, 2021**
Tabriz		East Azerbaijan	–	–	628	–	–	–	38	–	–	6.1	33	628	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
7 years (first grade)																			
Yasuj	Ilanshahr	Kohgiluyeh and Boyer–Ahmad	1233	1148	2381	5	176	181	0.41	15.3	7.6	64	2381	Both	Local	Local	Nov–Dec 1999	Overall	Shahraki et al., 2001**
		Sistan and Baluchestan	–	151	–	–	42	–	–	27.8	–	–	12	–	Females	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003**
Qom	Sanandaj	Qom	–	319	–	–	–	–	–	1.9	–	–	–	–	Females	Local	–	Randomly	Farzinnia et al., 2004**
		Kurdistan	–	–	230	–	–	26	–	–	11.3	18	230	Both	Local	Local	–	Randomly	Davari, Yaghmaei, 2005**
Kerman	Hamadan	Kerman	–	–	195	–	–	7	–	–	–	3.6	50	195	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
		Hamadan	–	–	56	–	–	11	–	–	19.6	12	56	Both	Local	Local	–	Overall	Nazari et al., 2006**
Amlash	Zabol	Gilan	–	–	754	–	–	76	–	–	10.1	95	754	Both	Local	Local	2003–2004	Overall	Rafinejad et al., 2006**
		Sistan and Baluchestan	–	228	–	–	46	–	–	20.2	–	32	–	–	Females	Local	2003	Randomly	Zareban et al., 2006**

Table 8. *Continuation*

Counties		E			I			I (%)			Sampling					References	
Age (education level)	Provinces	Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date		Selection
Qeshm	Hormozgan	–	–	–	–	–	–	–	–	11.6	–	–	Both	Local	–	Randomly	Soleimani-Ahmadi, 2007**
Sanandaj	Kurdistan	–	113	–	–	1	–	–	0.88	–	–	–	Females	Local	2005	Randomly	Yaghmaei et al., 2007**
Kerman	Kerman	–	–	6051	–	–	194	–	–	3.2	198	6051	Both	Local	Mar–Jun 2006	Overall	Motowali-Emami et al., 2008**
Bahar	Hamadan	–	–	180	–	–	3	–	–	1.7	18	180	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009**
Khajeh	East Azerbaijan	–	–	96	–	–	13	–	–	13.5	20	96	Both	Local	2008–2009	Randomly	Shayeghi et al., 2010**
Urmia	West Azerbaijan	–	–	423	–	–	20	–	–	4.7	35	423	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012**
Qom	Qom	–	–	–	–	–	–	–	23.6	–	–	–	Females	Local	2010	Randomly	Saghafipour et al., 2012**
Sanandaj	Kurdistan	–	148	–	–	4	–	–	2.7	–	27	–	Females	Local	–	Randomly	Vahabi et al., 2012**
Robat Karim	Tehran	–	10000	–	–	22	–	–	22.5	–	–	–	Females	Local	2008–2009	Randomly	Afshari et al., 2013**
Qom	Qom	–	–	–	–	28	–	–	15.5	–	45	–	Females	Local	2011	Overall	Noroozi et al., 2013**
Ravansar	Kermanshah	–	75	–	–	15	–	–	20.0	–	6	–	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	–	125	–	–	14	–	–	11.2	–	25	–	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Aran va Bidgol	Isfahan	–	–	717	–	–	1	–	–	0.14	19	717	Both	Local	Oct–Dec 2008	Randomly	Doroodgar et al., 2014a**
Kashan	Isfahan	–	–	624	–	–	2	–	–	0.3	23	624	Both	Local	Nov 2012–May 2013	Randomly	Doroodgar et al., 2014b**
Damghan	Semnan	–	–	–	–	11	–	–	11.3	–	–	–	Females	Local	2008	Overall	Mohammadi Azni, 2014**
Azadshahr	Golestan	–	287	–	–	15	–	–	5.2	–	–	–	Females	Local	2012–2013	Overall	Motewalli Haghi et al., 2014a**
Sari	Mazandaran	–	–	678	–	–	9	–	–	1.3	–	678	Both	Local	2012–2013	Randomly	Motewalli Haghi et al., 2014b**
Abadan	Khuzestan	–	–	104	–	–	5	–	–	4.8	26	104	Both	Local	2012	Randomly	Salehi et al., 2014**
Bayangan	Kermanshah	–	–	49	–	–	5	–	–	10.2	4	49	Both	Local	–	Randomly	Sayyadi et al., 2014**

Table 8. *Continuation*

Counties		Provinces	E			I			I (%)			Sampling				References		
Age (education level)			Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location		Date	Selection
Ahvaz		Khuzestan	—	—	991	—	—	251	—	—	25.3	—	991	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaci, 2021**
Tabriz		East Azerbaijan	—	—	1521	—	—	64	—	—	4.2	33	1521	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
Gilan-e Gharb		Kermanshah	—	—	500	—	—	25	—	—	5.0	—	500	Both	Local	2018	Overall	Zahrimia et al., 2021**
Paveh		Kermanshah	—	—	61	—	—	1	—	—	1.6	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghaghni, 2022
Gahavand		Hamadan	—	77	—	—	16	—	—	20.8	—	—	—	Females	Local	2020	Overall	Hajiloie et al., 2022**
Marivan		Kurdistan	—	—	8	—	—	3	—	—	37.5	—	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
Varzaqan		East Azerbaijan	—	—	44	—	—	7	—	—	15.9	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022
8 years (second grade)																		
Yasuj		Kohgiluyeh and Boyer-Ahmad	1234	1111	2345	6	212	218	0.49	19.1	9.3	64	2345	Both	Local	Nov–Dec 1999	Overall	Shahraki et al., 2001**
Iranshahr		Sistan and Baluchestan	—	156	—	—	40	—	—	25.6	—	12	—	Females	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003**
Qom		Qom	—	391	—	—	—	—	—	4.5	—	—	—	Females	Local	—	Randomly	Farzinnia et al., 2004**
Sanandaj		Kurdistan	—	—	242	—	—	72	—	—	29.7	18	242	Both	Local	—	Randomly	Davari, Yaghmaei, 2005**
Kerman		Kerman	—	—	223	—	—	4	—	—	1.8	50	223	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
Hamadan		Hamadan	—	—	75	—	—	8	—	—	10.7	12	75	Both	Local	—	Overall	Nazari et al., 2006**
Amlash		Gilan	—	—	701	—	—	67	—	—	9.6	95	701	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Zabol		Sistan and Baluchestan	—	216	—	—	49	—	—	22.7	—	32	—	Females	Local	2003	Randomly	Zareban et al., 2006**
Qeshm		Hormozgan	—	—	—	—	—	—	—	—	17.4	—	—	Both	Local	—	Randomly	Soleimani-Ahmadi, 2007**
Sanandaj		Kurdistan	—	115	—	—	4	—	—	3.5	—	—	—	Females	Local	2005	Randomly	Yaghmaei et al., 2007**

Kerman	Kerman	–	–	7965	–	–	103	–	–	1.3	198	7965	Both	Local	Mar–Jun 2006	Overall	Motovali-Emami et al., 2008**
Bahar	Hamadan	–	–	180	–	–	2	–	–	1.1	18	180	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009**
Khajeh	East Azerbaijan	–	–	113	–	–	5	–	–	4.4	20	113	Both	Local	2008–2009	Randomly	Shayeghi et al., 2010**
Urmia	West Azerbaijan	–	–	421	–	–	17	–	–	4.0	35	421	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012**
Qom	Qom	–	–	–	–	–	–	–	15.3	–	–	–	Females	Local	2010	Randomly	Saghafipour et al., 2012**
Sanandaj	Kurdistan	–	140	–	–	–	9	–	6.4	–	27	–	Females	Local	–	Randomly	Vahabi et al., 2012**
Robat Karim	Tehran	–	10000	–	–	–	19	–	19.4	–	–	–	Females	Local	2008–2009	Randomly	Afshari et al., 2013**
Qom	Qom	–	–	–	–	–	18	–	10.0	–	45	–	Females	Local	2011	Overall	Noroozi et al., 2013**
Ravansar	Kermanshah	–	63	–	–	–	11	–	17.5	–	6	–	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	–	117	–	–	–	13	–	11.1	–	25	–	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Aran va Bidgol	Isfahan	–	–	658	–	–	4	–	–	0.58	19	658	Both	Local	Oct–Dec 2008	Randomly	Dorooodgar et al., 2014a**
Kashan	Isfahan	–	–	206	–	–	3	–	–	1.5	23	206	Both	Local	Nov 2012–May 2013	Randomly	Dorooodgar et al., 2014b**
Damghan	Semnan	–	–	–	–	–	15	–	15.5	–	–	–	Females	Local	2008	Overall	Mohammadi Azni, 2014**
Azadshahr	Golestan	–	264	–	–	–	9	–	3.4	–	–	–	Females	Local	2012–2013	Overall	Motevali Haghi et al., 2014a**
Sari	Mazandaran	–	–	705	–	–	12	–	–	1.7	–	705	Both	Local	2012–2013	Randomly	Motevali Haghi et al., 2014b**
Abadan	Khuzestan	–	–	104	–	–	3	–	–	2.9	26	104	Both	Local	2012	Randomly	Salahi et al., 2014**
Bayangan	Kermanshah	–	–	75	–	–	7	–	–	9.3	4	75	Both	Local	–	Randomly	Sayyadi et al., 2014**
Bonab	East Azerbaijan	–	612	–	–	–	17	–	2.8	–	–	–	Females	Local	2013–2014	Overall	Kabiri et al., 2015**
Savojbolagh	Alborz	–	–	2744	–	–	50	–	–	1.8	–	2744	Both	Local	Sep–Dec 2013	Overall	Bahrami et al., 2016**
Galugah	Mazandaran	–	–	49	–	–	1	–	–	2.0	16	49	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016**
Khorramshahr	Khuzestan	–	–	–	–	–	–	–	–	0.7	10	–	Both	Local	2008–2009	Randomly	Kassiri, Gatfi, 2016**
Kalaleh	Golestan	–	–	190	–	–	9	–	–	4.7	4	190	Both	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016**

Table 8. *Continuation*

Counties		E			I		I (%)			Sampling					References		
Age (education level)	Provinces	Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date	Selection	
Paveh Sirik Bashagard	Kermanshah	—	87	—	—	14	—	—	16.1	—	5	—	Females	Local	—	Overall	Sayyad et al., 2016**
	Hormozgan	—	63	—	—	—	—	—	32.0	—	—	—	Females	Local	Nov 2015–Feb 2016	Randomly	Sanei–Dehkordi et al., 2017**
	Hormozgan	—	52	—	—	—	—	—	57.7	—	—	—	Females	Local	—	Randomly	Soleimani–Ahmadi et al., 2017**
Meshginshahr	Ardabil	—	—	390	—	—	40	—	—	2.1	20	390	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018**
	Ardabil	—	—	320	—	—	40	—	—	12.5	20	320	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018**
Meybod	Yazd	—	77	—	—	15	—	—	19.5	—	4	—	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**
Andimeshk, Dezful and Shush	Khuzestan	—	—	6143	—	—	798	—	—	13.0	280	6143	Both	Local	Feb–Jun 2016	Randomly	Nejati et al., 2018**
	Qom	—	347	—	—	36	—	—	10.4	—	75	—	Females	Local	Mar 2015–Mar 2017	Randomly	Saghafipour et al., 2018**
Sabzevar Badrud	Razavi Khorasan	—	—	222	—	—	33	—	—	14.9	—	222	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018**
	Isfahan	—	—	240	—	—	24	—	—	1.5	—	240	Both	Local	2017–2018	Overall	Dehghani et al., 2019**
Tonekabon	Mazandaran	—	233	—	—	32	—	—	13.7	—	—	—	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Mashhad	Razavi Khorasan	—	512	—	—	53	—	—	10.4	—	—	—	Females	Local	2017–2018	Randomly	Mohammadi et al., 2019**
Karun Semnan	Khuzestan	—	—	123	—	—	47	—	—	38.2	—	123	Both	Local	2017	Randomly	Kassiri et al., 2020b**
	Semnan	—	—	243	—	—	8	—	—	3.3	8	243	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020**
Khorrarnabad Ahvaz	Lorestan	—	—	159	—	—	23	—	—	14.5	—	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
	Khuzestan	—	—	992	—	—	290	—	—	29.2	—	992	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaei, 2021**
Tabriz	East Azerbaijan	—	—	1521	—	—	64	—	—	4.2	33	1521	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**

Gilan-e Gharb Paveh	Kermanshah	–	–	409	–	13	–	–	3.2	–	–	409	Both	Local	2018 Oct-Dec 2018	Overall	Zahrimia et al., 2021**
	Kermanshah	–	–	65	–	3	–	–	4.6	11	–	361	Both	Local	–	Overall	Bekri, Shaghaghi, 2022
	Hamadan	–	78	–	–	13	–	–	16.7	–	–	–	Females	Local	2020	Overall	Hajiloie et al., 2022**
	Kurdistan	–	–	44	–	–	–	–	34.1	–	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
9 years (third grade)	East Azerbaijan	–	–	61	–	7	–	–	11.5	26	–	400	Both	Local	Dec 2019– Jan 2020	Randomly	Sepehri, Jafari, 2022
Yasuj	Kohgiluyeh and Boyer-Ahmad	1207	1067	2274	17	259	276	1.4	24.3	12.1	64	2274	Both	Local	Nov-Dec 1999	Overall	Shahraki et al., 2001**
Iranshahr	Sistan and Baluchestan	–	169	–	–	40	–	–	23.7	–	12	–	Females	Local	Nov 2002– May 2003	Randomly	Alempour Salemi et al., 2003**
Qom	Qom	–	308	–	–	–	–	–	3.3	–	–	–	Females	Local	–	Randomly	Farzinnia et al., 2004**
Sanandaj	Kurdistan	–	–	198	–	–	65	–	–	32.8	18	198	Both	Local	–	Randomly	Davari, Yaghmaei, 2005**
Kerman	Kerman	–	–	213	–	–	14	–	–	6.6	50	213	Both	Local	Apr-Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
Hamadan	Hamadan	–	–	90	–	–	15	–	–	16.7	12	90	Both	Local	–	Overall	Nazari et al., 2006**
Amlash	Gilan	–	–	833	–	–	79	–	–	9.5	95	833	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Zabol	Sistan and Baluchestan	–	212	–	–	55	–	–	25.9	–	32	–	Females	Local	2003	Randomly	Zareban et al., 2006**
Qeshm	Hormozgan	–	–	–	–	–	–	–	–	19.0	–	–	Both	Local	–	Randomly	Soleimani-Ahmadi, 2007**
Sanandaj	Kurdistan	–	99	–	–	7	–	–	7.1	–	–	–	Females	Local	2005	Randomly	Yaghmaei et al., 2007**
Kerman	Kerman	–	–	9904	–	–	80	–	–	0.81	198	9904	Both	Local	Mar-Jun 2006	Overall	Motovali-Emami et al., 2008**
Bahar	Hamadan	–	–	180	–	–	2	–	–	1.1	18	180	Both	Local	Feb-Jun 2008	Randomly	Moradi et al., 2009**
Khajeh	East Azerbaijan	–	–	105	–	–	3	–	–	2.9	20	105	Both	Local	2008–2009	Randomly	Shayeghi et al., 2010**
Urmia	West Azerbaijan	–	–	368	–	–	8	–	–	2.2	35	368	Both	Local	Oct-Dec 2010	Randomly	Hazrati Tappeh et al., 2012**

Table 8. Continuation

Counties	Provinces	E			I			I (%)			Sampling					References	
		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date		Selection
Qom	Qom	–	–	–	–	–	–	–	18.3	–	–	–	Females	Local	2010	Randomly	Saghafipour et al., 2012**
Sanandaj Robat Karim Qom Aran va Bidgol	Kurdistan	–	187	–	–	5	–	–	2.7	–	27	–	Females	Local	–	Randomly	Vahabi et al., 2012**
	Tehran	–	10000	–	–	22	–	–	22.5	–	–	–	Females	Local	2008–2009	Randomly	Afshari et al., 2013**
	Qom	–	–	–	–	22	–	–	12.2	–	45	–	Females	Local	2011	Overall	Noroozi et al., 2013**
	Isfahan	–	–	710	–	6	–	–	0.85	–	19	710	Both	Local	Oct-Dec 2008	Randomly	Doroodgar et al., 2014**
Kashan	Isfahan	–	–	517	–	2	–	–	0.4	–	23	517	Both	Local	Nov 2012–May 2013	Randomly	Doroodgar et al., 2014b**
Damghan	Semnan	–	–	–	–	19	–	–	19.6	–	–	–	Females	Local	2008	Overall	Mohammadi Azni, 2014**
Azadshahr	Golestan	–	239	–	–	13	–	–	5.4	–	–	–	Females	Local	2012–2013	Overall	Motevalli Haghi et al., 2014a**
Sari	Mazandaran	–	–	702	–	11	–	–	1.6	–	–	702	Both	Local	2012–2013	Randomly	Motevalli Haghi et al., 2014b**
Abadan Bayangan Bonab Savojbolagh	Khuzestan	–	–	104	–	3	–	–	2.9	–	26	104	Both	Local	2012	Randomly	Salehi et al., 2014**
	Kermanshah	–	–	90	–	13	–	–	14.4	–	4	90	Both	Local	–	Randomly	Sayyadi et al., 2014**
	East Azerbaijan	–	621	–	–	24	–	–	3.9	–	–	–	Females	Local	2013–2014	Overall	Kabiri et al., 2015**
Galugah	Alborz	–	–	2701	–	52	–	–	1.9	–	–	2701	Both	Local	Sep-Dec 2013	Overall	Bahrami et al., 2016**
	Mazandaran	–	–	63	–	5	–	–	7.9	–	16	63	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016**
Khorramshahr Kalaleh	Khuzestan	–	–	–	–	–	–	–	3.4	–	10	–	Both	Local	2008–2009	Randomly	Kassiri, Gatfi, 2016**
	Golestan	–	–	184	–	11	–	–	6.0	–	4	184	Both	Local	Oct-Dec 2015	Randomly	Maleky et al., 2016**
Paveh Sirik	Kermanshah	–	92	–	–	18	–	–	19.6	–	5	–	Females	Local	–	Overall	Sayyad et al., 2016**
	Hormozgan	–	59	–	–	–	–	–	31.0	–	–	–	Females	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017**
Bashagard	Hormozgan	–	43	–	–	–	–	–	81.4	–	–	–	Females	Local	–	Randomly	Soleimani-Ahmadi et al., 2017**
Meshginshahr	Ardabil	–	–	390	40	–	–	–	2.1	–	20	390	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018**

Meshginshahr	Ardabil	-	-	320	-	-	40	-	12.5	20	320	Both	Local	Oct 2015–	Randomly	Moradiasl et al., 2018**
														Jun 2016		
Meybod	Yazd	-	82	-	-	-	-	-	13.4	4	-	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**
Andimeshk, Dezful and Shush	Khuzestan	-	-	7011	-	-	526	-	7.5	280	7011	Both	Local	Feb–Jun 2016	Randomly	Nejati et al., 2018**
Qom	Qom	-	343	-	-	-	42	-	12.2	75	-	Females	Local	Mar 2015–Mar 2017	Randomly	Saghafipour et al., 2018**
Sabzevar	Razavi Khorasan	-	-	189	-	-	28	-	14.8	-	189	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018**
Badrud	Isfahan	-	-	246	-	-	19	-	1.2	-	246	Both	Local	2017–2018	Overall	Dehghani et al., 2019**
Tonekabon	Mazandaran	-	265	-	-	-	48	-	18.1	-	-	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Mashhad	Razavi Khorasan	-	526	-	-	-	84	-	16.0	-	-	Females	Local	2017–2018	Randomly	Mohammadi et al., 2019**
Karun	Khuzestan	-	-	123	-	-	30	-	24.4	-	123	Both	Local	2017	Randomly	Kassiri et al., 2020b**
Semnan	Semnan	-	-	259	-	-	17	-	6.6	8	259	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020**
Khorramabad	Lorestan	-	-	332	-	-	35	-	10.5	-	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	-	-	992	-	-	244	-	24.6	-	992	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaci, 2021**
Tabriz	East Azerbaijan	-	-	1521	-	-	64	-	4.2	33	1521	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
Gilan-e Gharb	Kermanshah	-	-	459	-	-	10	-	2.2	-	459	Both	Local	2018	Overall	Zahirnia et al., 2021**
Paveh	Kermanshah	-	-	66	-	-	7	-	10.6	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghaghni, 2022
Gahavand	Hamadan	-	91	-	-	-	17	-	18.7	-	-	Females	Local	2020	Overall	Hajiloie et al., 2022**
Marivan	Kurdistan	-	-	111	-	-	22	-	19.8	-	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
Varzaqan	East Azerbaijan	-	-	66	-	-	6	-	9.1	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022
10 years (fourth grade)																
Yasuj	Kohgiluyeh and Boyer-Ahmad	1384	1296	2680	20	306	326	1.4	23.6	64	2680	Both	Local	Nov–Dec 1999	Overall	Shahraki et al., 2001**
Iranshahr	Sistan and Baluchestan	-	184	-	-	56	-	-	30.4	12	-	Females	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003**
Qom	Qom	-	351	-	-	-	-	-	7.4	-	-	Females	Local	-	Randomly	Farzinnia et al., 2004**

Table 8. Continuation

Counties		Provinces	E		I			I (%)			Sampling						References	
Age (education level)			Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date		Selection
Sanandaj		Kurdistan	–	–	263	–	–	42	–	–	15.9	18	263	Both	Local	–	Randomly	Davari, Yaghmaei, 2005**
Kerman		Kerman	–	–	224	–	–	2	–	–	0.89	50	224	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
Hamadan		Hamadan	–	–	89	–	–	14	–	–	15.7	12	89	Both	Local	–	Overall	Nazari et al., 2006**
Amlash		Gilan	–	–	932	–	–	83	–	–	8.9	95	932	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Zabol		Sistan and Baluchestan	–	–	209	–	–	75	–	–	35.9	32	–	Females	Local	2003	Randomly	Zareban et al., 2006**
Qeshm		Hormozgan	–	–	–	–	–	–	–	–	24.8	–	–	Both	Local	–	Randomly	Soleimani–Ahmadi, 2007**
Sanandaj		Kurdistan	–	–	104	–	–	8	–	–	7.7	–	–	Females	Local	2005	Randomly	Yaghmaei et al., 2007**
Kerman		Kerman	–	–	8972	–	–	45	–	–	0.5	198	8972	Both	Local	Mar–Jun 2006	Overall	Motovali–Emami et al., 2008**
Bahar		Hamadan	–	–	180	–	–	4	–	–	2.2	18	180	Both	Local	Feb–Jun 2008	Randomly	Moradi et al., 2009**
Khajeh		East Azerbaijan	–	–	87	–	–	2	–	–	2.3	20	87	Both	Local	2008–2009	Randomly	Shayeghi et al., 2010**
Urmia		West Azerbaijan	–	–	414	–	–	15	–	–	3.6	35	414	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012**
Qom		Qom	–	–	–	–	–	–	–	–	16.8	–	–	Females	Local	2010	Randomly	Saghafipour et al., 2012**
Sanandaj		Kurdistan	144	–	–	–	11	–	–	–	7.6	27	–	Females	Local	–	Randomly	Vahabi et al., 2012**
Robat Karim		Tehran	10000	–	–	–	21	–	–	–	21.4	–	–	Females	Local	2008–2009	Randomly	Afshari et al., 2013**
Qom		Qom	–	–	–	–	20	–	–	–	11.1	45	–	Females	Local	2011	Overall	Noroozi et al., 2013**
Ravansar		Kermanshah	78	–	–	–	14	–	–	–	17.9	6	–	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh		Kermanshah	188	–	–	–	11	–	–	–	5.9	25	–	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Aran va Bidgol		Isfahan	–	–	735	–	–	3	–	–	0.41	19	735	Both	Local	Oct–Dec 2008	Randomly	Doroodgar et al., 2014a**
Kashan		Isfahan	–	–	318	–	–	1	–	–	0.6	23	318	Both	Local	Nov 2012–May 2013	Randomly	Doroodgar et al., 2014b**

Table 8. Continuation

Counties		E			I			I (%)			Sampling					References	
Age (education level)	Provinces	Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date	Selection	
Mashhad	Razavi Khorasan	–	526	–	–	74	–	–	14.1	–	–	–	Females	Local	2017–2018	Randomly	Mohammadi et al., 2019**
Karun	Khuzestan	–	–	123	–	–	37	–	–	30.1	–	123	Both	Local	2017	Randomly	Kassiri et al., 2020b**
Birjand	South Khorasan	–	417	–	–	62	–	–	14.9	–	19	–	Females	Local	2017	Randomly	Lashkari et al., 2020**
Semnan	Semnan	–	–	259	–	–	17	–	–	6.6	8	259	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020**
Khorramabad	Lorestan	–	–	989	–	–	23	–	–	2.3	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	–	–	979	–	–	296	–	–	30.2	–	979	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaei, 2021**
Tabriz	East Azerbaijan	–	–	883	–	–	28	–	–	3.2	33	883	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
Gilan-e Gharb	Kermanshah	–	–	390	–	–	7	–	–	1.8	–	390	Both	Local	2018	Overall	Zahirmia et al., 2021**
Paveh	Kermanshah	–	–	64	–	–	9	–	–	14.1	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghaghi, 2022
Gahavand	Hamadan	–	87	–	–	15	–	–	17.2	–	–	–	Females	Local	2020	Overall	Hajiloie et al., 2022**
Marivan	Kurdistan	–	–	127	–	–	32	–	–	25.2	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
Varzaqan	East Azerbaijan	–	–	93	–	–	11	–	–	11.8	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri and Jafari, 2022
11 years (fifth grade)																	
Yasuj	Kohgiluyeh and Boyer-Ahmad	1380	1187	2567	12	313	325	0.87	26.4	12.7	64	2567	Both	Local	Nov–Dec 1999	Overall	Shahraki et al., 2001**
Iranshahr	Sistan and Baluchestan	–	131	–	–	33	–	–	25.2	–	12	–	Females	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003**
Qom	Qom	–	381	–	–	–	–	–	4.9	–	–	–	Females	Local	–	Randomly	Farzinnia et al., 2004**
Sanandaj	Kurdistan	–	–	262	–	–	30	–	–	11.5	18	262	Both	Local	–	Randomly	Davari, Yaghmaei, 2005**
Kerman	Kerman	–	–	259	–	–	13	–	–	5.0	50	259	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
Hamadan	Hamadan	–	–	97	–	–	7	–	–	7.2	12	97	Both	Local	–	Overall	Nazari et al., 2006**
Amlash	Gilan	–	–	1003	–	–	85	–	–	8.5	95	1003	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**

Table 8. Continuation

Counties		E			I			I (%)			Sampling						References
Age (education level)	Provinces	Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date	Selection	
Galugah	Mazandaran	–	–	68	–	–	3	–	–	4.4	16	68	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016**
Khorramshahr Kalaleh	Khuzestan Golestan	–	–	–	–	–	–	–	–	0.7	10	–	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016**
		–	–	167	–	–	15	–	–	9.0	4	167	Both	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016**
Paveh	Kermanshah	–	105	–	–	22	–	–	21.0	–	5	–	Females	Local	–	Overall	Sayyad et al., 2016**
Sirik	Hormozgan	–	55	–	–	–	–	–	39.0	–	–	–	Females	Local	Nov 2015–Feb 2016	Randomly	Sanei–Dehkordi et al., 2017**
Bashagard	Hormozgan	–	57	–	–	–	–	–	71.9	–	–	–	Females	Local	–	Randomly	Soleimani–Ahmadi et al., 2017**
Meshginshahr	Ardabil	–	–	108	–	–	11	–	–	0.55	20	108	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018**
Meshginshahr	Ardabil	–	–	321	–	–	13	–	–	4.0	20	321	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018**
Meybod	Yazd	–	53	–	–	5	–	–	9.4	–	4	–	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**
Andimeshk, Dezful and Shush	Khuzestan	–	–	5099	–	–	399	–	–	7.8	280	5099	Both	Local	Feb–Jun 2016	Randomly	Nejati et al., 2018**
Qom	Qom	–	346	–	–	61	–	–	17.6	–	75	–	Females	Local	Mar 2015–Mar 2017	Randomly	Saghafipour et al., 2018**
Sabzevar	Razavi Khorasan	–	–	188	–	–	21	–	–	11.2	–	188	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018**
Badrud	Isfahan	–	–	246	–	–	14	–	–	0.87	–	246	Both	Local	2017–2018	Overall	Dehghani et al., 2019**
Tonekabon	Mazandaran	–	254	–	–	57	–	–	22.4	–	–	–	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Mashhad	Razavi Khorasan	–	443	–	–	47	–	–	10.6	–	–	–	Females	Local	2017–2018	Randomly	Mohammadi et al., 2019**
Karun	Khuzestan	–	–	131	–	–	26	–	–	19.8	–	131	Both	Local	2017	Randomly	Kassiri et al., 2020b**
Birjand	South Khorasan	–	1549	–	–	197	–	–	12.7	–	19	–	Females	Local	2017	Randomly	Lashkari et al., 2020**
Khorramabad	Lorestan	–	–	1127	–	–	24	–	–	2.1	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Ahvaz	Khuzestan	–	–	977	–	–	202	–	–	20.7	–	977	Both	Local	Jan 2016–Jun 2017	Randomly	Kassiri, Mehraghaci, 2021**

Tabriz	East Azerbaijan	–	–	883	–	–	–	28	–	–	3.2	33	883	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
Gilan-e Gharb Pavah	Kermanshah Kermanshah	–	–	337	–	–	–	5	–	–	1.5	–	337	Both	Local	2018	Overall	Zahrimia et al., 2021**
		–	–	65	–	–	–	4	–	–	6.2	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghagh, 2022
Gahavand	Hamadan	–	94	–	–	–	–	16	–	–	17.0	–	–	Females	Local	2020	Overall	Hajiloie et al., 2022**
Marivan	Kurdistan	–	–	59	–	–	–	12	–	–	20.3	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
Varzaqan	East Azerbaijan	–	–	91	–	–	–	7	–	–	7.7	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022
12 years (sixth grade)																		
Iranshahr	Sistan and Baluchestan	–	61	–	–	–	–	27	–	–	44.3	12	–	Females	Local	Nov 2002–May 2003	Randomly	Alempour Salemi et al., 2003**
Kerman	Kerman	–	–	86	–	–	–	5	–	–	5.8	50	86	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
Amlash	Gilan	–	–	21	–	–	–	2	–	–	9.5	95	21	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Sanandaj	Kurdistan	–	66	–	–	–	–	11	–	–	16.7	–	–	Females	Local	2005	Randomly	Yaghmaei et al., 2007**
Urmia	West Azerbaijan	–	–	826	–	–	–	29	–	–	3.5	35	826	Both	Local	Oct–Dec 2010	Randomly	Hazrati Tappeh et al., 2012**
Robat Karim	Tehran	–	10000	–	–	–	–	1	–	–	1.0	–	–	Females	Local	2008–2009	Randomly	Afshari et al., 2013**
Ravansar	Kermanshah	–	77	–	–	–	–	8	–	–	10.4	6	–	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	–	176	–	–	–	–	8	–	–	4.5	25	–	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Azadshahr	Golestan	–	246	–	–	–	–	5	–	–	2.0	–	–	Females	Local	2012–2013	Overall	Motevali Haghi et al., 2014a**
Sari	Mazandaran	–	–	902	–	–	–	15	–	–	1.7	–	902	Both	Local	2012–2013	Randomly	Motevali Haghi et al., 2014b**
Abadan	Khuzestan	–	–	104	–	–	–	4	–	–	3.8	26	104	Both	Local	2012	Randomly	Salehi et al., 2014**
Bonab	East Azerbaijan	–	639	–	–	–	–	16	–	–	2.5	–	–	Females	Local	2013–2014	Overall	Kabiri et al., 2015**
Kaleh	Golestan	–	–	167	–	–	–	15	–	–	9.0	4	167	Both	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016**
Sirik	Hormozgan	–	45	–	–	–	–	–	–	–	36.0	–	–	Females	Local	Nov 2015–Feb 2016	Randomly	Sanei-Dehkordi et al., 2017**
Bashagard	Hormozgan	–	47	–	–	–	–	–	–	–	68.1	–	–	Females	Local	–	Randomly	Soleimani-Ahmadi et al., 2017**
Meshginshahr	Ardabil	–	–	126	–	–	–	13	–	–	0.66	20	126	Both	Local	2015–2016	Randomly	Abbasgholizadeh et al., 2018**

Table 8. Continuation

Counties		Provinces	E			I			I (%)			Sampling				References		
			Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date	Selection				
Age (education level)	Meshginshahr	Ardabil	–	–	320	–	–	11	–	–	3.4	20	320	Both	Local	Oct 2015–Jun 2016	Randomly	Moradiasl et al., 2018**
		Yazd	–	62	–	–	8	–	–	12.9	–	4	–	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**
Sabzevar	Badrud	Razavi Khorasan	–	–	187	–	–	19	–	–	10.2	–	187	Both	Local	2015–2016	Randomly	Tarkhasi et al., 2018**
		Isfahan	–	–	237	–	–	10	–	–	0.62	–	237	Both	Local	2017–2018	Overall	Dehghani et al., 2019**
Tonekabon		Mazandaran	–	240	–	–	49	–	–	20.4	–	–	–	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Mashhad		Razavi Khorasan	–	580	–	–	64	–	–	11.0	–	–	–	Females	Local	2017–2018	Randomly	Mohammadi et al., 2019**
Birjand	Semnan	South Khorasan	–	451	–	–	70	–	–	15.5	–	19	–	Females	Local	2017	Randomly	Lashkari et al., 2020**
Semnan		Semnan	–	–	265	–	–	15	–	–	5.7	8	265	Both	Local	Mar 2018–May 2018	Randomly	Shirzadi et al., 2020**
Khorramabad	Tabriz	Lorestan	–	–	1168	–	–	25	–	–	2.1	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021
Tabriz		East Azerbaijan	–	–	883	–	–	28	–	–	3.2	33	883	Both	Local	Jan–Mar 2018	Randomly	Norouzi et al., 2021**
Gilan-e Gharb	Paveh	Kermanshah	–	–	420	–	–	4	–	–	1.0	–	420	Both	Local	2018	Overall	Zahirmia et al., 2021**
		Kermanshah	–	–	40	–	–	2	–	–	5.0	11	361	Both	Local	Oct–Dec 2018	Overall	Bekri, Shaghaghi, 2022
Gahavand	Marivan	Hamadan	–	72	–	–	12	–	–	16.7	–	–	–	Females	Local	2020	Overall	Hajiloie et al., 2022**
		Kurdistan	–	–	108	–	–	25	–	–	23.1	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
Varzaqan		East Azerbaijan	–	–	45	–	–	3	–	–	6.7	26	400	Both	Local	Dec 2019–Jan 2020	Randomly	Sepehri, Jafari, 2022
Family income			E			I			I (%)									
		P	M	R	P	M	R	P	M	R								
Sanandaj	Kurdistan	97	324	774	38	95	102	39.2	29.3	13.2	18	1195	Both	Local	–	Randomly	Davari, Yaghmaei, 2005**	
Sarab	East Azerbaijan	108	505	48	–	–	–	13.0	4.6	0	40	661	Both	Local	Aug 2013–Mar 2014	Randomly	Dehghanzadeh et al., 2015**	
Meybod	Yazd	63	210	129	11	26	22	17.5	12.4	17.1	4	402	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**	

Qom	Qom	908	334	483	160	50	19	17.6	15.0	3.9	75	1725	Females	Local	Mar 2015– Mar 2017	Randomly	Saghafipour et al., 2018**
Birjand	South Khorasan	284	268	588	53	34	46	18.7	12.7	7.8	19	2417	Females	Local	2017	Randomly	Lashkari et al., 2020**
		133	524	110	14	23	3	10.5	4.4	2.7	8	767	Both	Local	Mar 2018– May 2018	Randomly	Shirzadi et al., 2020**
Marivan	Kurdistan	174	195	81	40	52	15	23.0	26.7	18.5	–	457	Both	Local	2018–2019	Randomly	Rad et al., 2022
		49	282	59	16	23	2	32.7	8.2	3.4	26	400	Both	Local	Dec 2019– Jan 2020	Randomly	Sepehri, Jafari, 2022
Hair length		E			I			I (%)									
		S	M	L	S	M	L	S	M	L							
Kerman	Kerman	738	–	462	9	–	36	1.2	–	7.8	50	1200	Both	Local	Apr–Jun 2003	Randomly	Kamiabi, Nakhaei, 2005**
Amlash	Gilan	2657	1085	502	157	159	76	5.9	14.7	15.1	95	4244	Both	Local	2003–2004	Overall	Rafinejad et al., 2006**
Sanandaj	Kurdistan	230	222	148	11	20	15	4.8	9.0	10.1	–	600	Females	Local	2005	Randomly	Yaghmaei et al., 2007**
Sanandaj	Kurdistan	291	314	205	16	15	7	5.5	4.8	3.4	27	810	Females	Local	–	Randomly	Vahabi et al., 2012**
Ravansar	Kermanshah	162	124	99	18	18	25	11.1	14.5	25.3	6	385	Females	Local	–	Overall	Sayyadi et al., 2013**
Paveh	Kermanshah	273	292	185	20	29	11	7.3	9.9	5.9	25	750	Females	Local	2009–2010	Randomly	Vahabi et al., 2013**
Bayangan	Kermanshah	140	150	94	19	23	12	13.6	15.3	12.8	4	384	Both	Local	–	Randomly	Sayyadi et al., 2014**
Sarab	East Azerbaijan	310	256	95	–	–	–	2.3	5.5	16.8	40	661	Both	Local	Aug 2013– Mar 2014	Randomly	Dehghanzadeh et al., 2015**
Savojbolagh	Alborz	1406	3068	8308	23	75	140	1.6	2.4	1.7	–	12782	Both	Local	Sep–Dec 2013	Overall	Bahrami et al., 2016**
Galugah	Mazandaran	108	–	192	5	–	12	4.6	–	6.3	16	300	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016**
Kalaleh	Golestan	325	140	68	5	13	16	1.5	9.3	23.5	4	541	Both	Local	Oct–Dec 2015	Randomly	Maleky et al., 2016**
Paveh	Kermanshah	175	180	130	25	38	22	14.3	21.1	16.9	5	485	Females	Local	–	Overall	Sayyad et al., 2016**
Jahrom	Fars	307	282	128	22	20	7	7.2	7.1	5.5	–	717	Both	Local	2016–2017	Randomly	Majidi et al., 2017**
Meybod	Yazd	133	168	101	30	15	14	22.6	8.9	13.9	4	402	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**
Bojnurd	North Khorasan	334	277	227	14	8	7	4.0	2.8	2.6	–	867	Both	Local	2016	Randomly	Firoozfar et al., 2019**
Tonekabon	Mazandaran	343	645	478	83	123	86	24.2	19.1	18.0	–	1466	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**
Karun	Khuzestan	444	–	307	88	–	129	19.8	–	42.0	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b**

Table 8. Continuation

Countries		Provinces		E			I			I (%)			Sampling					References
Age (education level)		Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both	Schools	Students	Gender	Location	Date	Selection		
Khorramabad Ahvaz	Lorestan	723	2178	989	23	70	55	3.2	3.2	5.6	–	3890	Both	Local	2018–2019	Randomly	Galehdar et al., 2021 Kassiri, Mehraghaei, 2021**	
	Khuzestan	3516	–	2414	710	–	852	20.2	–	35.3	–	5930	Both	Local	Jan 2016– Jun 2017	Randomly		
Gilan–e Gharb		1213	708	594	8	17	39	0.66	2.4	6.6	–	2515	Both	Local	2018	Overall	Zahirmia et al., 2021**	
Hairstyle		E			I			I (%)										
		St	C	W	St	C	W	St	C	W								
Hamadan Amlash	Hamadan	290	62	–	33	22	–	10.2	26.2	–	12	847	Both	Local	–	Overall	Nazari et al., 2006** Rafinejad et al., 2006**	
	Gilan	3621	–	623	294	–	98	8.1	–	15.7	95	4244	Both	Local	2003–2004	Overall		
Sari	Mazandaran	3695	–	1017	56	–	22	1.5	–	2.2	–	4712	Both	Local	2012–2013	Randomly	Motevalli Haghi et al., 2014b**	
Sarab	East Azerbaijan	438	160	63	–	–	–	5.9	6.2	1.6	40	661	Both	Local	Aug 2013– Mar 2014	Randomly	Dehghanzadeh et al., 2015**	
Galugah	Mazandaran	258	–	42	13	–	4	5.0	–	9.5	16	300	Both	Local	2009–2010	Randomly	Kassiri, Esteghali, 2016**	
Khorramshahr Asadabad	Khuzestan	–	–	–	–	–	–	1.0	–	2.6	10	750	Both	Local	2008–2009	Randomly	Kassiri, Gatifi, 2016** Nazari et al., 2016a**	
	Hamadan	527	–	73	10	–	4	1.9	–	5.5	16	600	Both	Local	2013–2014	Randomly		
Jahrom	Fars	649	–	68	38	–	11	5.9	–	16.2	–	717	Both	Local	2016–2017	Randomly	Majidi et al., 2017**	
Meybod	Yazd	328	63	11	49	9	1	14.9	14.3	9.1	4	402	Females	Local	2015–2016	Randomly	Morovati Sharif Abadi et al., 2018**	
Bojnurd	North Khorasan	374	176	288	8	7	14	2.1	3.3	4.6	–	867	Both	Local	2016	Randomly	Firoozfar et al., 2019**	
Tonekabon	Mazandaran	1105	–	361	209	–	83	18.9	–	22.9	–	1466	Females	Local	2017–2018	Randomly	Heidarpour et al., 2019**	
Karun Khorramabad Ahvaz	Khuzestan	637	–	114	174	–	43	27.3	–	37.7	–	751	Both	Local	2017	Randomly	Kassiri et al., 2020b** Galehdar et al., 2021	
	Lorestan	3169	720	–	122	26	–	3.8	3.6	–	–	3890	Both	Local	2018–2019	Randomly		
Tabriz	Khuzestan	4783	–	1147	1147	–	415	24.0	–	36.2	–	5930	Both	Local	Jan 2016– Jun 2017	Randomly	Kassiri, Mehraghaei, 2021**	
	East Azerbaijan	2495	–	537	117	–	13	4.7	–	2.4	33	3032	Both	Local	Jan–Mar 2018	Randomly		Norouzi et al., 2021**

Notes. C – curly, E – examined, I – infested, L – long (> shoulder level), M – medium, M – medium (> 3 cm to shoulder level), P – poor, R – rich, S – short (< 3 cm), St – straight, W – wavy. **Cited in Nasirian, 2023b.

Table 9. Descriptive statistics and Kruskal-Wallis test comparison of factor impact on *P. capitis* infestation level, based on a literature search

Variables	Median (IQR)	P-values	P _C -values	Variables	Median (IQR)	P-values	P _C -values	Variables	Median (IQR)	P-values	P _C -values
Population				Private and public schools							
Preschools	5.1 (2.2–7.9)	< 0.001	< 0.05	Private	6.5 (0.73–14.2)	0.462	> 0.05	Ardabil	4.5 (2.1–10.3)		
Primary schools	8.4 (3.2–17.4)			Public				Bushehr	2.9 (2.4–12.0)		
Community	5.5 (1.8–10.0)			Rural and urban areas	8.3 (5.5–17.2)			Chaharmahal and Bakhtiari	0.35 (0.24–0.59)		
Community age groups	2.6 (1.4–6.0)			Rural				East Azerbaijan	4.2 (2.8–7.8)		
Student age groups				Urban				Fars	4.2 (0.72–7.4)		
6 years	8.6 (7.3–24.0)			Student education levels	3.6 (1.6–14.6)	0.329	> 0.05	Gilan	8.5 (3.8–10.1)		
7 years	11.1 (3.3–19.7)			First grade	1.7 (0.75–10.4)			Golestan	5.4 (4.1–9.0)		
8 years	9.8 (3.1–16.3)			Second grade	10.9 (3.6–20.0)	0.894	> 0.05	Hamadan	5.6 (1.7–16.7)		
9 years	10.0 (3.0–18.6)			Third grade	9.8 (3.1–16.3)			Hormozgan	33.3 (20.9–59.4)		
10 years	8.8 (2.4–17.2)			Fourth grade	10.0 (3.0–18.6)			Ilam	5.6 (0.97–32.4)		
11 years	8.8 (2.9–18.2)			Fifth grade	8.8 (2.4–17.2)			Isfahan	0.75 (0.41–1.5)		
12 years	5.8 (2.9–14.2)			Sixth grade	8.8 (2.9–18.2)			Kerman	2.9 (1.3–0.68)		
Community targets				Community age groups	5.8 (2.9–14.2)			Kermanshah	10.4 (5.7–16.1)		
Community	10.1 (4.5–20.0)	< 0.001	< 0.05	6–18 years				Khuzestan	11.0 (3.0–25.8)		
Health centers	10.0 (5.6–17.8)			19–29 years	2.4 (1.2–5.2)	0.004	> 0.05	Kohgiluyeh and Boyer-Ahmad	9.3 (1.4–17.2)		
Secondary schools	5.0 (3.0–6.4)			30–60 years	7.3 (5.9–9.3)			Kurdistan	8.4 (4.8–22.0)		
Student community	1.9 (0.92–3.4)			> 60 years	9.9 (7.9–11.9)			Lorestan	3.8 (2.2–10.5)		
Gender				Family income level	2.3 (1.2–3.2)			Markazi	1.8 (1.5–2.5)		
Boys	1.8 (0.53–5.4)	< 0.001	< 0.05	Poor	18.2 (16.4–25.4)	0.024	> 0.05	Mazandaran	6.5 (2.0–17.8)		
Girls	12.4 (5.9–20.0)			Medium	12.6 (7.3–17.9)			North Khorasan	5.3 (3.0–11.6)		
Both (boys and girls)	1.8 (0.53–5.4)			Rich				Qazvin	1.9 (1.7–2.3)		
Father's education levels				Mother's education levels	5.9 (3.2–14.2)			Qom	12.2 (7.5–17.4)		
								Razavi Khorasan	13.1 (10.6–15.5)		

Table 9. Continuation

Variables	Median (IQR)	P-values	Variables	Median (IQR)	P-values	Variables	Median (IQR)	P-values
Population			Private and public schools			Ardabil		
Illiterate	18.6 (10.3–26.5)	< 0.001	Illiterate	20.4 (9.3–26.6)	< 0.001	Semnan	5.9 (4.1 – 15.5)	
Primary schools	9.2 (5.1–20.4)		Primary schools	8.0 (4.0–18.5)		Sistan and Baluchestan	25.2 (9.2–30.4)	
Secondary schools	7.5 (2.8–15.5)		Secondary schools	4.7 (1.7–10.15)		South Khorasan	13.6 (9.3–15.8)	
University or higher	5.4 (1.9–7.7)		University or higher	3.3 (0.72–8.7)		Tehran	5.5 (1.5–20.4)	
Bathing frequency			Hair washing frequency			West Azerbaijan	3.6 (3.5–5.5)	
Once two weeks	11.3 (1.3–21.3)	0.380	Once two weeks	5.0 (1.3–8.7)	0.380	Yazd	13.4 (9.0–16.7)	
once a week	11.3 (5.8–17.0)		once a week	10.6 (3.7–23.4)		Zanjan	1.9 (0.77–6.9)	
twice a week	6.4 (3.4–12.7)		twice a week	4.9 (1.3–14.4)		Years		
≥ 3	10.1 (6.1–19.0)		≥ 3	6.8 (3.7–11.0)		1999	3.7 (0.95–8.6)	< 0.001
BFE			History of infestation			2000	5.1 (5.1–5.1)	< 0.05
Yes	4.5 (2.4–8.3)	0.034	Yes	41.4 (34.1–47.1)	0.003	2001	12.0 (1.6–22.0)	
No	14.9 (6.0–39.7)	> 0.05	No	8.6 (4.0–9.3)	> 0.05	2002	14.1 (9.2–19.2)	
HII			Sharing equipment			2003	26.3 (25.2–30.4)	
Yes	6.5 (3.9–13.0)	0.023	Yes	13.2 (7.4–27.4)	0.002	2004	4.5 (3.6–4.9)	
No	13.4 (6.4–19.2)	> 0.05	No	5.7 (3.0–12.6)	> 0.05	2005	5.7 (3.1–12.3)	
Student hair length			Student hair style			2006	10.7 (8.5–19.6)	
Short	5.7 (3.0–13.8)	0.186	Straight	5.9 (3.0–12.6)	0.770	2007	10.9 (7.1–17.4)	
Medium	9.0 (4.4–14.6)		Curly	6.2 (3.6–14.3)		2008	2.7 (1.3–4.9)	
Long	11.5 (5.8–17.2)		Wavy	9.1 (2.6–16.2)		2009	1.5 (1.1–2.2)	
Regions			Climatic regions			2010	3.7 (2.3–7.7)	
Region 1	6.3 (2.8–15.1)	< 0.001	Moderate and humid climate ^a	6.2 (2.9–11.8)	< 0.001	2011	6.3 (3.5–29.7)	
Region 2	5.5 (0.86–24.0)	< 0.05	Cold climate ^b	6.9 (2.7–14.2)		2012	5.7 (3.5–14.6)	
Region 3	5.7 (3.2–10.7)		Semidesert and temperate climate	3.9 (0.74–11.5)		2013	11.2 (6.8 – 17.5)	
Region 4	9.1 (2.8–18.8)		Hot and dry climate ^c	8.6 (3.3–17.9)		2014	2.9 (1.4–9.8)	

Region 5	10,6 (3.8–16.0)		Hot and humid climate	18,5 (4.8–30.4)			2015	3,9 (2.4–7.9)
Family size							2016	5,0 (2.0–9.5)
III	6,1 (2.7–14.1)	0,073	> 0,05	5,7 (2.7–11.0)	0,009	> 0,05	2017	36,0 (15.5–60.4)
IV	6,7 (3.3–13.6)			5,5 (2.2–10.6)			2018	6,8 (2.1–12.5)
V	9,9 (5.7–17.0)			6,8 (2.2–15.5)			2019	14,6 (4.5–20.4)
VI	13,9 (6.7–20.4)			7,8 (3.2–20.3)			2020	9,0 (3.3–20.3)
≥ 7	13,3 (4.8–23.7)			1,9 (1.8–2.8)	< 0,001	< 0,05	2021	5,0 (3.2–20.7)
							2022	15,9 (7.7–20.8)

Due to the right skewness of the distribution, instead of the mean and standard deviation, the median and the interquartile range of the *P. capitis* infestation percentage were reported. For this reason, the Kruskal-Wallis test was used instead of an ANOVA. Since most tests are hypothesis-free, *P_c*-values is the criterion for declaring significance, and raw *P*-values is invalid. The simultaneously significant *P*- and *P_c*-values (*P* < 0.05) are shown in bold font. BFE – bathing facility existence in student residences, HII – health instructor involvement in student schools, *P_c* – corrected *P*-value based on Bonferroni correction (26 simultaneous tests), IQR – inter-quartile range. ^a The southern shores of the Caspian Sea, ^b the Western mountains, ^c the central plateau, ^d the South coast.

Table 10. Interaction modeling with Poisson regression

Interaction with time trend (years)	IRR (95% CI)	P-value
Gender		
Boys	0.99809 (1.00117–0.19671)	0.104
Girls	0.99772 (1.00117–0.14399)	0.0526
Both (boys and girls)	0.99833 (1.00117–0.24171)	0.1556
Population		
Primary schools	1.00013 (1.00004–17.11576)	0.0045 *
Community	1.00003 (1.00004–1.90027)	0.5208
Community age groups	0.99993 (1.00004–0.27637)	0.1985
Climatic region		
Cold climate (the Western mountains)	1.00004 (1.00001–60.0994)	< 0.001*
Semidesert and temperate climate	0.9999 (1.00004–0.0015)	< 0.001*
Hot and dry climate (the central plateau)	1.00009 (1.00001→10000)	< 0.001*
Hot and humid climate (the south coast)	1.00043 (1.00001→10000)	< 0.001*

* Significant at the level of 0.05. The significant *P*-values ($P < 0.05$) are shown in bold font.

IRR – incidence rate ratio (H0: IRR = 1), CI – confidence interval.

A critical point is that, for the first time in this study, the impact of the meridians and the tropics that pass through Iran was also evaluated on *P. capitis* infestation. For this reason, the effect of the meridians at 50°E, 55°E and 60°E, and the tropics at 30°N and 35°N on *P. capitis* infestation trends in Iran was investigated. Based on the results of the study, the trends of *P. capitis* infestation in the meridians 55°E (Fig. 4f) and 60°E (Fig. 4g), and the tropics 30°N (Fig. 4h) and 35°N (Fig. 4i) have increased over the last two decades. The trend of *P. capitis* infestation in the meridian 50°E has decreased (Fig. 4e). These results are also a reflection of the geographic and climatic regions that were described and interpreted above. The reason is that the trend of *P. capitis* infestation has only increased in autumn (Fig. 4c), and the trends of *P. capitis* infestation have decreased in spring (Fig. 4a), summer (Fig. 4b), and winter (Fig. 4d) over the last two decades. The occurrence of *P. capitis* infestation varies according to the year's seasonal circulation, with a maximum in late summer and early autumn. During the summer, particularly during the summer holidays, more frequent and intensive head-to-head contact may occur than during other periods of the year. During the summer months, and particularly during the summer holidays, children have more head contacts per unit of time than during other periods of the year. Besides, travel increases the likelihood that other children are encountered, of whom one or another might be infested with head lice. The increased exposure would then build up a reservoir of infested children when school opens after the summer holidays. In addition, longevity and fecundity depend on environmental factors such as air temperature and humidity, which have important consequences on collective biology such as the propagation of lice populations and their dispersion (Bauer et al., 2009; Nasirian, 2023b).

Lice infestation is very common in a community and is relatively higher in younger age groups compared with the adult population. The highest level of *P. capitis* infestation has been observed among primary school students in the population (8.4%). The highest level of *P. capitis* infestation has been observed in 7-year-old students (11.0%) and, as a result, at the first-grade educational level (10.9%). The *P. capitis* infestation level among girls (12.4%) was 6.9 times higher than boys (1.8%) because they have longer and thicker hair,

which provides an optimal environment for the growth and occurrence of head lice. Furthermore, girls are more likely to spend their time in nearby play areas and engage during play in more head-to-head contact. Head lice also flourish indoors, while boys tend to spend more time outdoors engaging in active informal sporting activities (Alberfkani and Mero, 2020; Nasirian and Ahmadi, 2024). The highest level of *P. capitis* infestation has been observed among the regions five (10.6%) and four (9.1%), respectively. The highest level of *P. capitis* infestation has been observed in the hot and humid climatic region (18.5%). The highest level of *P. capitis* infestation has been observed in winter (7.8%) and autumn (6.8%), respectively. The students in public schools (8.3%) and rural areas (3.6%) are more infested with *P. capitis* than those in private schools (6.5%) and urban areas (1.7%). Compared to the global average *P. capitis* infestation level (25%) (Nasirian and Ahmadi, 2024), the most infested provinces and years have been Hormozgan (33.3%), Sistan and Baluchestan (25.2%), and 2017 (36.0%) and 2003 (26.3%), respectively (Table 9).

Based on the intensity of *P. capitis* infestation, the order of the influence of the factors that affect infestation is: history of infestation (in case of existence: 41.4%), mother's education level (illiterate: 20.4%), father's education level (illiterate: 18.6%), family income level (poor: 18.2%), bathing facility existence in student residences (in case of absence: 14.9%), family size (if VI persons or ≥ 7 : 13.9 or 13.3%), health instructor involvement in student schools (in case of absence: 13.4%), sharing equipment (in case of existence: 13.2%), bathing frequency (once two weeks or once a week: 11.3%), hair washing frequency (once a week: 10.6%), and student hairstyle (wavy: 9.1%) (Table 9). The factors such as locality, regions, climatic regions, the meridians and the tropics, and years that were measured in this study should also be added.

Poisson regression modeling is used to study the effects of risk and protective factors on the incidence rate of an outcome. In our case, interaction modeling demonstrated that primary schools have a synergistic impact on time trends. In addition, the Western mountains, the central plateau, and the southeast showed synergistic effects with time trends on the incidence of the outcome. Adherence to proper hygiene practices, such as frequent hair washing and refraining from sharing personal items, can mitigate the risk of head lice infestation. Individuals suffering from head lice must minimize close contact with others until they are fully treated to prevent transmission (Galván-Casas et al., 2024). By fostering awareness about head lice infestations and ensuring access to effective treatments, Iran can work towards diminishing the incidence of this widespread issue among school-aged children. A collaborative effort between healthcare providers, schools, and families is essential for addressing and managing head lice infestations within the community (Alshaer, 2023). Education is very important for the progress of any country and depends on the health of its community.

CONCLUSION

The findings provide the national baseline data to initiate steps for national pediculosis intervention programs.

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DATA AVAILABILITY

The authors declare that they are satisfied with the availability of data and materials online.

ETHICAL TREATMENT OF ANIMALS

Not applicable.

CONFLICT OF INTEREST

None.

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НОВЫЕ АСПЕКТЫ, КАСАЮЩИЕСЯ ЗАРАЖЕННОСТИ ВШАМИ PEDICULUS CAPITIS (ANOPLURA: PEDICULLIDAE) В ИРАНЕ

Х. Назариан, С.А.И. Ахмади

Ключевые слова: *Pediculus capitis*, климатические регионы, распространение, тренды зараженности, меридианы, стратификация, тропики

Данные по уровню заражения и факторам, влияющим на зараженность головными вшами *P. capitis* населения Ирана, были суммированы по сведениям из 126 литературных источников. За последние двадцать лет уровень зараженности вшами вырос более чем в половине провинций Ирана. Эти провинции расположены в основном в районе южного берега Каспийского моря. Моделирование взаимодействия различных факторов показало, что основную роль в возрастании заболевания педикулезом играет пребывание детей в начальной школе в условиях их тесного контакта друг с другом и отсутствия необходимых гигиенических мероприятий. Приведенные данные позволяют разработать меры борьбы с педикулезом населения в Иране.

К ЮБИЛЕЮ АНДРЕЯ БОРИСОВИЧА ШАТРОВА

Редакционная коллегия журнала «Паразитология»*
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28 августа 2024 г. исполнилось 70 лет со дня рождения главного научного сотрудника Зоологического института РАН (ЗИН) Андрея Борисовича ШАТРОВА. Андрей Борисович (А.Б.) родился в Ленинграде. В 1972 г. он поступил на вечернее отделение биолого-почвенного факультета Ленинградского (ныне Санкт-Петербургского) государственного университета, который окончил в 1978 г. с присвоением квалификации биолог-зоолог-цитолог-гистолог.

В 1972 г. А.Б. работал лаборантом лаборатории систематики насекомых ЗИН, а затем с 1973 по 1979 г. – лаборатории паразитологии ЗИН. После окончания основной аспирантуры ЗИН в 1983 г. А.Б. защитил кандидатскую диссертацию по теме «Морфофункциональные адаптации личинок краснотелковых клещей (Trombiculidae) к паразитизму» под руководством профессора, член-корреспондента РАН Ю.С. Балашова. Спустя 12 лет, в 1995 г., А.Б. защитил докторскую диссертацию на тему: «Постэмбриональное развитие, морфология и особенности паразитизма краснотелковых клещей (Acariformes, Trombiculidae)». Результатом многолетних исследований А.Б. явилась монография «Краснотелковые клещи и их паразитизм на позвоночных животных», опубликованная в 2000 г.

Еще будучи студентом, благодаря знакомству с литературой и собственным гистологическим исследованиям, А.Б. обратил внимание на электронную микроскопию, методы которой позволяли по-новому изучить строение стилостома. Эта структура формируется в тканях грызунов при питании личинок клещей-краснотелок. Для исследования стилостома, жизненного цикла и биологии клещей-краснотелок А.Б. разработал оригинальную методику ведения лабораторной культуры. Однако для питания дейтонимф и взрослых клещей необходимы яйца коллембол. Коллемболы японского недиапазирующего вида *Sinella curvisela* Brook, 1882 в количестве нескольких десятков особей были любезно переданы А.Б. известным специалистом по фауне систематике клещей-краснотелок – сотрудником Зоологического музея Московского государственного университета Н.И. Кудряшовой. Наличие уникальной лабораторной культуры создало основу для проведения детальных ультраструктурных исследований клещей-краснотелок на различных стадиях их жизненного цикла.

Сбор личинок в природе для культивирования и гистологических исследований потребовал выездов в экспедиции в различные регионы бывшего СССР и России, от Молдавии и Средней Азии до Дальнего Востока и Приморья. Одновременно с экспериментальными исследованиями и накоплением эмпирического материала А.Б. проводил теоретический анализ онтогенеза клещей и других членистоногих.

Результатом многолетних исследований А.Б. явились более 150 научных работ, опубликованных в высокорейтинговых отечественных и иностранных журналах. Каждая работа А.Б. представляет собой не только подробное морфофункциональное исследование, но и глубокое фундаментальное научное обобщение. Им была предложена оригинальная теория происхождения паразитизма, а также становления сложного онтогенеза у краснотелковых клещей и близких к ним таксонов, обоснованы положения о принципах организации, закономерностях индивидуального развития и эволюционных тенденциях этой группы паразитических клещей. Анализ паразито-хозяйных отношений вносит существенный вклад в развитие общих вопросов паразитологии. Работы А.Б. также расширяют знания о морфологическом разнообразии и особенностях функционирования органов и тканей у представителей важной с медицинской точки зрения группы паукообразных.

А.Б. активно участвует в работе всероссийских и международных конференций, является членом Диссертационного совета 1.5.17 по специальности «Паразитология» при Зоологическом институте РАН, членом редколлегии отечественного журнала «Acarina», а также ведущих международных acarологических журналов – «International Journal of Acarology», «Acarologia», «Experimental and Applied Acarology», «Acta Zoologica», «Invertebrate Reproduction and Development», «Arthropod Structure and Development» и других.

А.Б. на протяжении многих лет, начиная с 1997 г. руководил рядом инициативных проектов РФФИ, а также государственной темой научно-исследовательских работ «Структурно-функциональные особенности пищеварительной, выделительной и сенсорной систем акариформных и паразитиформных клещей и насекомых (слепней) в связи с паразитизмом».

Многие, не простые для отечественной науки годы, А.Б. делал все возможное для стабильной работы отделения электронной микроскопии лаборатории паразитологии. Благодаря настойчивости А.Б. были приобретены просвечивающий цифровой электронный микроскоп «Morgagni 268D» (FEI Company) и сканирующий электронный микроскоп «Quanta

250» (FEI Company), настольный сканирующий электронный микроскоп «Hitachi TM-1000», а также два ультрамикротомы Leica UC-6 (Leica, Germany). Это позволило ЗИН оставаться в лидерах в данной области зоологических исследований.

В 1980-е годы А.Б. в течение пяти лет возглавлял Профсоюзный комитет ЗИН. А.Б. ведет активную просветительскую деятельность. В старейшей газете России «Санкт-Петербургские ведомости» регулярно выходят его публицистические и научно-популярные статьи. Он – автор сборника сказок и двух сборников стихов.

Редакционная коллегия журнала «Паразитология», Паразитологическое общество, коллеги и друзья сердечно поздравляют Андрея Борисовича Шатрова с юбилейной датой, и желают ему здоровья и творческих успехов.