

National Lifetime Prevalence and Demographic Factors of Urolithiasis in Iran

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Purpose: To estimate the current lifetime prevalence of urolithiasis at the national level in Iran and investigate the potential influential demographic factors in different geographical areas.

Materials and methods: An epidemiological study was conducted between October 2020 and November 2022 in 31 provinces of Iran at the national level. Data was obtained through telephone interviews with households. Items in the interview included questions about the current and past episodes of urolithiasis, family history of urolithiasis, and demographic and environmental variables of potential interest in urolithiasis.

Results: A total of 44186 participants were investigated from 31 provinces of Iran. The overall percentage of those with lifetime prevalence of urolithiasis was 6.6%, including 7.9% for males and 5.3% for females ($P < .001$). In addition, with regard to the residential location, men were 53% (7.9% vs. 5.2%) more susceptible than women to urinary stones in urban areas and 36% (7.8% vs. 5.7%) more susceptible in rural areas. Out of 31 provinces, the Sistan-baluchistan province had the highest lifetime prevalence (15.6%) and the Golestan province had the lowest (2.1%). The lifetime prevalence of urolithiasis in the rural areas was 6.8% versus 6.5% in the urban areas ($P = .29$). Regarding age differences, the lifetime urolithiasis prevalence has increased up to the age of 70 years. In addition, the most prominent increase in the lifetime prevalence was observed in the age range of 20 to 60 years (from 0.9% to 11.8%). The ethnicity with the highest lifetime prevalence rate of urolithiasis was the Baluch ethnicity (18%).

Conclusion: Generally, 6.6% of Iranian population suffers from urinary stones during their lifetime. Urolithiasis prevalence has increased 0.06% annually compared to the latest national study that took place 15 years ago. This increasing trend seems to be less prominent than other countries. According to our findings, urinary stones are more prevalent in men than in women and in the third to sixth decade of life. Baluch ethnicity is associated with the highest lifetime prevalence rate of urolithiasis and there is no significant difference between rural and urban areas. However, the ratio of male to female risk of urolithiasis is higher in urban areas compared to rural areas.

Keywords: national study; epidemiology; urolithiasis; prevalence; Iran; demographic factors

INTRODUCTION

The worldwide estimated prevalence of urolithiasis ranges from 1 to 13 percent in different countries of the world and demographic factors such as age, race, and gender are some of the known factors that can affect this prevalence⁽¹⁻³⁾. The prevalence rate has increased in recent years and it is predicted that this number will rise more in the coming decades due to the environmental changes like global warming^(4,6).

With regard to the prevalence and occurrence of this disease, several articles have been published globally and in Asia which have discussed the effects of individual features⁽⁷⁻¹¹⁾. However, few studies in Iran have evaluated the prevalence or incidence of urinary stone disease at the national level. The latest published national study focusing on the epidemiology of urolithiasis dates back to 15 years ago⁽¹²⁾.

Taking into account the above elaborations, we per-

formed an epidemiological study on urolithiasis at the national level and investigated the potential influential demographic factors in different geographical parts of Iran in a cross-sectional study from October 2020 to November 2022.

MATERIALS AND METHODS

The Iran National Stone Survey (INSS) was a national epidemiological study of urolithiasis approved by the Iranian National Institute for Medical Research Development (NIMAD) under the approved number: 989248 and approved ethic number of IR.NIMAD.REC.1399.113. The protocol of the INSS study is briefly summarized below: The estimated prevalence population of Iran was based on the 2017 census and the estimated yearly growth rate of each province was based on the estimation of the Iranian National Statistics Center divided to the urban or rural areas⁽¹³⁾. The design of the

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Received December 2022 & Accepted February 2023

Table 1. The distribution of participants' demographic factors

		Frequency (percent)
Gender	Female	22076 (50%)
	Male	22110 (50%)
Age	< 20	11153 (25.4%)
	≥ 20, < 50	20471 (46.7%)
	≥ 50	12222 (27.9%)
Educational level	Preschool	5234 (11.9%)
	School	16660 (37.7%)
	Diploma	10588 (24.0%)
Ethnicity	Academic	11660 (26.4%)
	Fars	26469 (60.0%)
	Turk	8519 (19.3%)
	Lor	3423 (7.7%)
	Kurd	3357 (7.6%)
	Arab	1092 (2.5%)
Employment	Baluch	1068 (2.4%)
	others	202 (0.5%)
	Unemployed	16704 (37.8%)
	Kid and preschool	2248 (5.1%)
	Student of school or university	10938 (24.8%)
Urban or rural	Employed	14294 (32.3%)
	Rural	11719 (26.5%)
	Urban	32467 (73.5%)

study was to approach households and to enroll every member of the selected households. The average number of people in each household was estimated to be 3.3 according to the latest census data of 2017⁽¹³⁾. According to previous studies, the estimated prevalence of nephrolithiasis in Iran is about 5%⁽¹²⁾. Considering a relative precision of 0.05, the required sample size for this study was at least 29196 participants across the country⁽¹⁴⁾. Since we planned to perform multi-stage random sampling, by considering design effect, approximately at least 1.5 times, equivalent to 43794 participants would be required. Therefore, at least 13271 households

were required to reach the total calculated population. As the coverage of household telephone is 98.8% at the national level based on the report by Statistical Centre of Iran⁽¹⁵⁾, we chose to use phone numbers to randomly select households from each province. For each selected household, a local telephone interviewer was planned and conducted by the representatives of the local medical university (especially in Turkish-speaking areas, the province of Sistan-Baluchistan, Bushehr, and Khuzestan) who were carefully instructed by the INSS core personnel on the interview items. For every selected household, information of any resident member of the household was questioned by the interviewers. Items in the interview included questions about the current and past episodes of urolithiasis, family history of urolithiasis, and demographic or environmental variables of potential interest in urolithiasis. The Lifetime prevalence of urolithiasis was defined as any history of stone formation or spontaneous stone passage in the entire lifetime of the respondents. The completed interviews were recorded in pre-planned data entry software and centrally controlled and checked by the core steering committee of INSS at the Urology and Nephrology Research Center (UNRC). In case of non-response in each call, calls were done again the next day and two days later at three different times of the day. In cases of no response after seven phone calls, the number was recorded as no-answer and rest of the numbers on the list were called.

Statistical analysis

Descriptive characteristics are presented as mean with standard deviation (SD) for quantitative variables or as a number and percentage for categorical variables.

Table 2. The Lifetime Prevalence of urolithiasis in different provinces of the country with regard to residential location

Province	Sample size	Frequency (percent)	95.0 % CI	Urban	95.0 % CI	Rural	95.0 % CI
				Frequency(percent)		Frequency(percent)	
East azarbaijan	2147	188 (8.8%)	7.6%-10.0%	150 (9.7%)	8.3%-11.2%	38 (6.3%)	4.6%-8.5%
West azarbaijan	1800	102 (5.7%)	4.7%-6.8%	81 (6.9%)	5.6%-8.4%	21 (3.4%)	2.2%-5.0%
Ardabil	651	54 (8.3%)	6.4%-10.6%	36 (7.6%)	5.4%-10.2	18 (10.3%)	6.4%-15.4%
Isfahan	2796	196 (7.0%)	6.1%-8.0%	178 (7.2%)	6.3%-8.3%	18 (5.4%)	3.4%-8.3%
Alborz	1483	67 (4.5%)	3.5%-5.7%	50 (3.6%)	2.7%-4.7%	17 (15.6%)	9.7%-23.3%
Ilam	317	14 (4.4%)	2.6%-7.1%	10 (4.6%)	2.4%-8.0%	4 (4.0%)	1.4%-9.3%
Bushehr	948	57 (6.0%)	4.6%-7.7%	46 (7.0%)	5.2%-9.2%	11 (3.8%)	2.0%-6.4%
Tehran	7274	368 (5.1%)	4.6%-5.6%	333 (4.9%)	4.4%-5.4%	35 (7.8%)	5.6%-10.6%
Chahar mahal bakhtiari	553	51 (9.2%)	7.0%-11.8%	40 (11.1%)	8.2%-14.7	11 (5.7%)	3.0%-9.6%
South khorasan	420	19 (4.5%)	2.8%-6.8%	15 (6.1%)	3.6%-9.6%	4 (2.3%)	0.8%-5.4%
Central khorasan	3534	206 (5.8%)	5.1%-6.6%	142 (5.5%)	4.7%-6.4%	64 (6.8%)	5.3%-8.5%
North khorasan	474	23 (4.9%)	3.2%-7.1%	16 (6.1%)	3.6%-9.4%	7 (3.3%)	1.5%-6.4%
Khuzestan	2585	146 (5.6%)	4.8%-6.6%	109 (5.6%)	4.6%-6.7%	37 (5.8%)	4.2%-7.8%
Zanjan	574	36 (6.3%)	4.5%-8.5%	22 (5.7%)	3.7%-8.3%	14 (7.6%)	4.4%-12.0%
Semnan	383	21 (5.5%)	3.5%-8.1%	16 (5.2%)	3.2%-8.2%	5 (6.4%)	2.5%-13.5%
Sistan-baluchistan	1539	240 (15.6%)	13.8%-17.5%	126 (16.4%)	13.9%-19.1%	114 (14.8%)	12.4%-17.5%
Fars	2663	238 (8.9%)	7.9%-10.1%	179 (9.6%)	8.3%-11.0%	59 (7.4%)	5.7%-9.4%
Qazvin	706	36 (5.1%)	3.7%-6.9%	29 (5.6%)	3.8%-7.8%	7 (3.8%)	1.7%-7.3%
Qom	950	49 (5.2%)	3.9%-6.7%	22 (3.3%)	2.1%-4.9%	27 (9.5%)	6.5%-13.3%
Kurdistan	896	48 (5.4%)	4.0%-7.0%	34 (5.5%)	3.9%-7.5%	14 (5.1%)	2.9%-8.2%
Kerman	1699	146 (8.6%)	7.3%-10.0%	95 (9.7%)	7.9%-11.6%	51 (7.1%)	5.4%-9.2%
Kermanshah	1067	86 (8.1%)	6.5%-9.8%	58 (7.2%)	5.6%-9.1%	28 (10.7%)	7.4%-14.9%
Kohgiluyeh and boyer-ahmad	390	27 (6.9%)	4.7%-9.8%	15 (6.9%)	4.1%-10.8	12 (7.0%)	3.9%-11.5%
Golestan	1021	21 (2.1%)	1.3%-3.1%	15 (2.8%)	1.6%-4.4%	6 (1.3%)	0.5%-2.6%
Gilan	1389	100 (7.2%)	5.9%-8.6%	41 (4.7%)	3.4%-6.2%	59 (11.6%)	9.0%-14.6%
Lorestan	964	75 (7.8%)	6.2%-9.6%	49 (7.9%)	5.9%-10.2%	26 (7.6%)	5.2%-10.8%
Mazandaran	1795	84 (4.7%)	3.8%-5.7%	57 (5.5%)	4.2%-7.0%	27 (3.6%)	2.4%-5.1%
Markazi	783	66 (8.4%)	6.6%-10.5%	54 (9.0%)	6.9%-11.4%	12 (6.6%)	3.7%-11.0%
Hormozgan	806	31 (3.8%)	2.7%-5.3%	14 (3.8%)	2.2%-6.2%	17 (3.8%)	2.3%-5.9%
Hamadan	947	57 (6.0%)	4.6%-7.7%	31 (5.2%)	3.6%-7.2%	26 (7.5%)	5.1%-10.6%
Yazd	632	61 (9.7%)	7.5%-12.1%	53 (10.0%)	7.6%-12.7%	8 (7.9%)	3.8%-14.4%
Total	44186	2913 (6.6%)	6.4%-6.8%	2116 (6.5%)	6.3%-6.8%	797 (6.8%)	6.4%-7.3%

Table 3. The lifetime Prevalence distribution of urolithiasis according to ethnicity and demographic factors

		Urolithiasis		OR (95.0 % CI)	P value
		No	Yes		
Gender	Female	20904 (94.7%)	1172 (5.3%)	Ref	< 0.001
	Male	20369 (92.1%)	1741 (7.9%)	1.52 (1.41, 1.64)	
Age; years	< 20	11051 (99.1%)	102 (0.9%)	Ref	< 0.001
	≥ 20, < 50	19179 (93.7%)	1292 (6.3%)	7.29 (5.95, 8.94)	
	≥ 50	10739 (87.9%)	1483 (12.1%)	14.96 (12.22, 18.31)	
Residence location	Rural	10922 (93.2%)	797 (6.8%)	Ref	0.289
Ethnicity	Urban	30351 (93.5%)	2116 (6.5%)	1.04 (0.96, 1.13)	
	Fars	24862 (93.9%)	1607 (6.1%)	Ref	
	Turk	7926 (93.0%)	593 (7.0%)	1.15 (1.05, 1.27)	
	Lor	3172 (92.7%)	251 (7.3%)	1.22 (1.06, 1.40)	
	kurd	3162 (94.2%)	195 (5.8%)	0.95 (0.81, 1.11)	
	Arab	1033 (94.6%)	59 (5.4%)	0.88 (0.67, 1.15)	
	Baluch	876 (82.0%)	192 (18.0%)	3.39 (2.87, 3.99)	
	others	189 (93.6%)	13 (6.4%)	1.06 (0.60, 1.87)	

Estimates of percent prevalence and 95% confidence interval (CI) were computed. Odds ratios (OR) were reported to compare the odds of kidney stone in age, sex, and ethnicity groups.

RESULTS

Totally 35986 residential households were called, 23055 calls were not answered after seven calls. A total of 12931 contacts were successfully made with households but 952 households refused to cooperate with the study. Finally, 11979 households cooperated and agreed to provide the required information by the interviewer. The gathered data provides information of 44186 individuals. The mean ± SD (range) age of the participants was 36 ± 21 (0-110) years and the mean ± SD (range) number of household members was 4 ± 1 (1-15). Participants' distribution according to the individual and ethnic characteristics is demonstrated in **Table 1**.

Prevalence and geographical distribution maps

Generally, 6.6% (2913 people) out of 44186 participants reported to have at least one urinary stone episode

in their lifetime (lifetime prevalence).

In **Table 2**, lifetime prevalence of urolithiasis and its distribution in different provinces are illustrated. The highest lifetime stone prevalence was observed in the Sistan-baluchistan province (15.6%) and the lowest was observed in the Golestan province (2.1%).

The lifetime urolithiasis prevalence separately for provincial rural and urban areas is demonstrated in **Figures 1 and 2**. The highest prevalence of provincial urban areas was observed in the Sistan-baluchistan province while the highest provincial urolithiasis prevalence in rural areas belonged to the Alborz province.

Distribution of the lifetime urolithiasis prevalence according to individual and ethnic characteristics

According to the findings, among 2913 participants who had suffered from urolithiasis at least one time in their whole life, the lifetime risk of having stone in men was 48% more than women (7.9% vs. 5.3%; $P < .001$). In addition, with regard to the residential location, men were 53% (7.9% vs. 5.2%) more susceptible to stones in urban areas and 36% (7.8% vs. 5.7%) in rural areas.

Table 4. The lifetime Prevalence distribution in different decades of life in total and separately for men and women

	Age; years	People interviewed	People with lifetime stone number (%)	95.0% CI for percent
Total	< 10	4033	35 (0.9%)	0.6%-1.2%
	≥ 10, < 20	7120	67 (0.9%)	0.7%-1.2%
	≥ 20, < 30	6567	194 (3.0%)	2.6%-3.4%
	≥ 30, < 40	7152	465 (6.5%)	5.9%-7.1%
	≥ 40, < 50	6752	633 (9.4%)	8.7%-10.1%
	≥ 50, < 60	5544	652 (11.8%)	10.9%-12.6%
	≥ 60, < 70	4056	527 (13.0%)	12.0%-14.1%
	≥ 70, < 80	1954	229 (11.7%)	10.4%-13.2%
	≥ 80, < 90	603	67 (11.1%)	8.8%-13.8%
	≥ 90	65	8 (12.3%)	6.0%-21.9%
Men	<10	1913	16 (0.8%)	0.5%-1.3%
	≥ 10, < 20	3612	36 (1.0%)	0.7%-1.4%
	≥ 20, < 30	3362	102 (3.0%)	2.5%-3.7%
	≥ 30, < 40	3467	285 (8.2%)	7.3%-9.2%
	≥ 40, < 50	3258	384 (11.8%)	10.7%-12.9%
	≥ 50, < 60	2752	387 (14.1%)	12.8%-15.4%
	≥ 60, < 70	2098	310 (14.8%)	13.3%-16.3%
	≥ 70, < 80	1052	141 (13.4%)	11.4%-15.6%
	≥ 80, < 90	375	48 (12.8%)	9.7%-16.5%
	≥ 90	47	7 (14.9%)	6.9%-27.0%
Women	< 10	2120	19 (0.9%)	0.6%-1.4%
	≥ 10, < 20	3508	31 (0.9%)	0.6%-1.2%
	≥ 20, < 30	3205	92 (2.9%)	2.3%-3.5%
	≥ 30, < 40	3685	180 (4.9%)	4.2%-5.6%
	≥ 40, < 50	3494	249 (7.1%)	6.3%-8.0%
	≥ 50, < 60	2792	265 (9.5%)	8.4%-10.6%
	≥ 60, < 70	1958	217 (11.1%)	9.7%-12.5%
	≥ 70, < 80	902	88 (9.8%)	7.9%-11.8%
	≥ 80, < 90	228	19 (8.3%)	5.3%-12.4%
	≥ 90	18	1 (5.6%)	0.6%-23.2%



Figure 1. Geographical distribution map of the lifetime prevalence of urolithiasis in the rural population of Iran

The mean \pm SD age of patients with urolithiasis was 49.2 ± 15.9 years. Considering gender classification, mean \pm SD age was 49.8 ± 15.8 years in men and 48.3 ± 16.1 years in women. In addition, the age group under 20 years old was less susceptible to stone compared to other age groups ($P < .001$). The lifetime prevalence of urolithiasis in the rural areas was 6.8% versus 6.5% in the urban areas ($P = .29$). Regarding ethnicity, the lifetime risk of urolithiasis in the Lor and Turk ethnicities have been observed to be 21% and 15% higher respectively, compared to the Fars ethnicity, which was considered as the reference category ($P = .004$ and $P = .003$, respectively). On the other hand, the lifetime prevalence in the Arab and Kurd ethnicities were reported to be 11% and 4% lower respectively than the Fars ethnicity ($P = .88$ and $P = .55$, respectively). At last, the Baluch community had three times more risk of urolithiasis than the Fars ethnicity ($P < .001$). The distribution of lifetime prevalence according to individual and ethnic features can be observed in detail in **Table 3**. Distribution of the lifetime prevalence of urinary stones in different decades of life is shown in **Table 4** with and without gender classification. As expected, the lifetime urolithiasis prevalence has increased up to the age of 70 years. In addition, the most prominent increase in lifetime prevalence was observed in the age of 20 to 60 years (from 0.9% to 11.8%). The lifetime prevalence trend of urolithiasis in different decades of life has been illustrated in **Figure 3**.

DISCUSSION

According to our findings, the lifetime prevalence of urolithiasis was estimated to be 6.6% in the Iranian population. Out of 31 provinces, the Sistan-baluchistan province had the highest (15.6%) and the Golestan province had the lowest (2.1%) lifetime prevalence. In addition, the risk of having stone was about 1.5 times higher in males compared to females. Urolithiasis was not sig-

nificantly more common in rural areas than urban areas of the country. Regarding age differences, the lifetime prevalence of urinary stones has increased up to 70. In addition, the most prominent increase in lifetime prevalence was observed in the third to sixth decade of life (from 0.9% to 11.8%). The ethnicity with the highest prevalence of urolithiasis was the Baluch ethnicity. Few studies have been conducted on the lifetime prevalence of urolithiasis in the recent years in Iran at the national level. The latest published study dates back to 15 years ago by Safarinejad et al⁽¹²⁾ in which 8413 participants were randomly selected from 30 counties in Iran and were interviewed. The lifetime prevalence of urolithiasis was estimated to be 5.7% in that study which was 0.9% lower than our study (6.6%). This difference can be partly explained by the passage of 15 years of that study and also the increasing trend of urolithiasis prevalence in the Middle East⁽¹⁶⁾. In addition, this upward trend is also observed in other countries around the world⁽¹⁾. In an epidemiological study by Chewcharat et al⁽⁴⁾, it was estimated that the prevalence rate of nephrolithiasis in the United States has increased by an annual rate of 0.16% which was higher than the estimated annual rise in our country (0.06%). This difference might be justified by the growing trend of industrialization existing in western countries.⁽¹⁷⁾ It has been estimated that 1%-19.1% of the population suffers from urolithiasis in different countries of Asia. On the other hand Iran is considered among the countries with medium prevalence of urinary tract stones⁽⁹⁾. In a cross-sectional study by Nassir et al⁽¹⁰⁾ conducted on February 2017 in Makkah region of Saudi Arabia, a total of 1056 participants were investigated through direct interviews. They were questioned about lifetime prevalence and demographic features which showed that the estimated lifetime prevalence was 6.2% in that region which was close to our study (6.6%), suggesting the similarity in the prevalence of urolithiasis in this



Figure 2. Geographical distribution map of the lifetime prevalence of urolithiasis in the urban population of Iran

region. However, in a cross-sectional study by Muslumanoglu et al⁽¹⁸⁾ on 2468 participants from 33 provinces of Turkey, a 11.1% lifetime history of urolithiasis was reported. This higher prevalence rate in Turkey in comparison with other neighboring countries is probably due to the pattern of industrialization similar to western countries⁽¹⁷⁾. Similarly, articles published in the eastern Asia have elucidated that the lifetime prevalence of urolithiasis

is higher than the western Asian countries such as our country. In a study by Zeng et al⁽¹⁹⁾, 12570 individuals in general population of china were investigated from May 2013 to July 2014. They were interviewed by questionnaires including the history of Urolithiasis in their lifetime along with demographic features. The lifetime prevalence was estimated to be 15.5% in the whole country that is higher than our country (6.6%). This might be explained due to different dietary habits

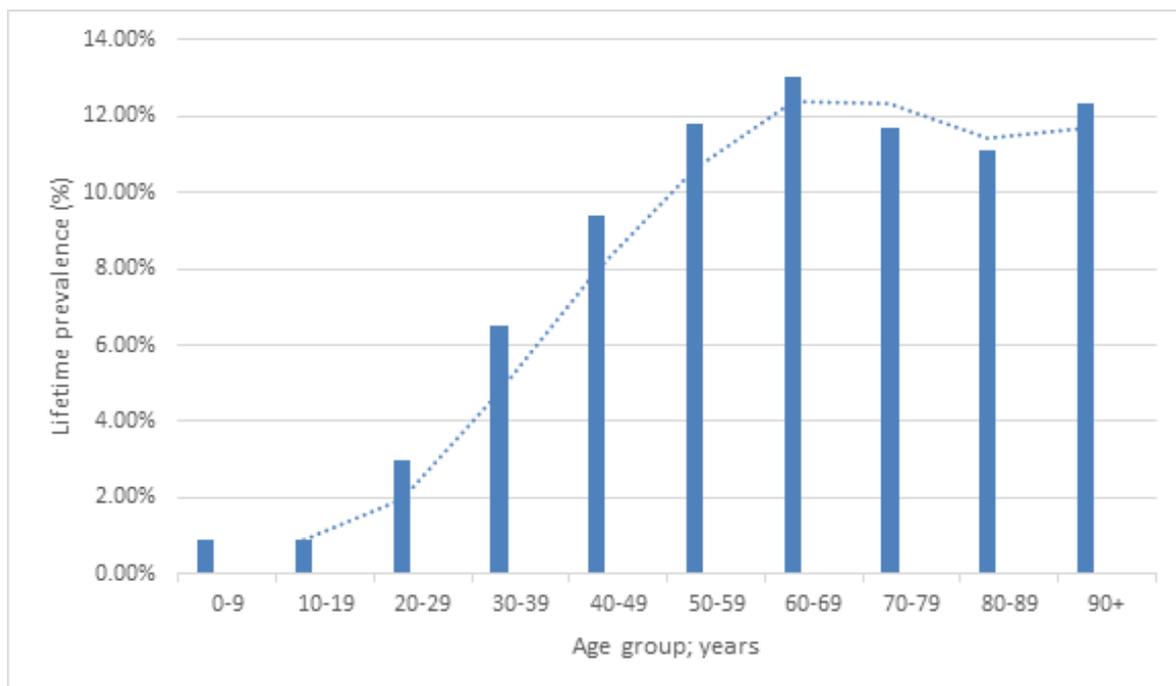


Figure 3. The lifetime prevalence trend of urolithiasis in different decades of life

(such as high meat and salt consumption) and genetic factors^(20,21).

Likewise, studies from industrialized western countries have shown relatively higher prevalence rates than our country. For instance, in a cross-sectional study by Vega et al⁽²²⁾ in Spain, 2444 individuals were investigated and interviewed by telephone and questioned about demographic and socioeconomic variables along with history of formation or passage of urinary stones in their lifetime. In total population, estimated lifetime prevalence of urolithiasis was reported to be 14.6% which is higher than our country. This difference can be justified due to western dietary habit (higher meat and lower vegetable consumption) compared to our country^(21,23). In parallel, in a nationwide epidemiological study from the United States of America, Hill et al⁽²⁴⁾ evaluated 10521 participants from 2015 to 2018 and reported a lifetime prevalence of 11% among US population in that period of time which is meaningfully higher than our prevalence rate. It seems that higher Body Mass Index (BMI) and prevalence of obesity along with western dietary habits lead to higher lifetime prevalence in that study compared to our country^(21,23,25,26).

In terms of racial and ethnic factors, the Baluch ethnicity had the highest lifetime prevalence compared to other provinces in our study ($P < .001$). However, no significant difference was reported by the latest published study⁽¹²⁾, which evaluated this aspect of urolithiasis at the national level. It can be due to smaller sample size of that study (8413) compared to our study (44186) in addition to using local interviewers in our article, which have made our findings more reliable and more accurate.

Regarding gender, men were 48% more prone to urinary stone compared to women in our study, which was generally similar to other articles, which evaluated this aspect of urolithiasis. This finding might be due to difference in employment rate between men and women in Iran and also other countries^(13,27,28). In a cohort study by Dr. Khalili and colleagues⁽²⁹⁾ on 10000 participants from Rafsanjan city, odds of having a urinary stone was 57% more in men which was similar to our article (52%). Several articles in industrialized countries like china⁽¹⁹⁾ and the United States⁽³⁰⁾ have mentioned similar findings with less significant differences (21% and 27%, respectively) which might be due to higher participation of women in industry as labor force in those countries compared to our country^(28,31).

Regarding residential location, urolithiasis was more common in men compared to women in both urban and rural areas in our study. Nevertheless, the between-gender difference was less significant in rural areas (36%) than urban areas (53%), which might be explained by the difference in rate of unemployment in females between rural and urban areas^(13,28,32).

The lifetime prevalence of urolithiasis has increased up to the age of 70 years in our study. In addition, this upward trend was more prominent between the age of 20 to 60 years (3rd to 6th decades of life) denoted by the highest slope of the fitted regression line in **Figure 3** (from 0.9% to 11.8%). It might be indicated that incidence rate of urinary stones in this age group is higher than other age ranges. In a study by Nassir et al⁽¹⁰⁾, which had been briefly mentioned above, a positive linear correlation was reported between participants' age and lifetime prevalence of urolithiasis. In addition,

middle aged population had more increasing trend of lifetime prevalence compared to other age ranges which was similar to our findings.

Our study had some limitations. The most important was the long period of conduction due to the large sample size and COVID-19 pandemic. This could affect the results of our study. In addition, prevalence-incidence bias and unmeasured probable confounding variables were also among our limitations in this study. However, large statistical sample size compared to other studies, in addition to using local interviewers have made our findings more accurate and more reliable.

CONCLUSIONS

Generally, 6.6% of population in Iran suffers from urolithiasis during their lifetime. Urinary stone prevalence has increased 0.06% annually since the last national study that took place 15 years ago. Urolithiasis is observed to be more prevalent in men than women and in the Baluch people than other ethnicities. The age range of 20 to 60 years has a more prominent increasing trend in urolithiasis prevalence compared to other age groups and there is no significant difference between rural and urban areas. However, the ratio of male to female risk of urolithiasis is higher in urban areas compared to rural areas.

ACKNOWLEDGEMENT

This study was supported by the National Institute for Medical Research Development (NIMAD) (the ethics code of IR.NIMAD.REC.1399.113). We would like to appreciate Iran Telecommunication Organization, all the interviewers who were involved in this study in all provinces, and also all the families who were interviewed for their cooperation.

CONFLICT ON INTEREST

The authors report no conflict of interests.

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