Prevalence and factors contributing to consanguineous marriages in Morocco

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Abstract

Background: Consanguinity, the tradition of marrying within ancestral kinship, remains common in many Arab and Middle Eastern countries, despite its well-known health risks.

Aim: To explore the prevalence of consanguineous marriage in Settat, Morocco, and the contributing factors.

Methods: This cross-sectional analytical study collected data on consanguineous marriage from 453 married Moroccan women aged ≥18 years, using an interviewer-administered structured questionnaire, and analysed the data using SPSS version 26.

Results: We found a consanguineous marriage rate of 26.7% (average consanguinity coefficient 0.0145871) among the respondents, with mostly (69.4%) first cousin marriages. Consanguinity was mostly influenced by parental consanguinity, traditional marriage arrangement, age at time of marriage, education level, rural vs urban residence, and socioeconomic status.

Conclusion: Our findings show that consanguinity is still prevalent in Morocco due to a combination of reasons. Targeted interventions should be implemented to increase awareness and knowledge about the health risks of consanguinity and reduce its prevalence among the population.

Keywords: consanguineous marriage, consanguinity, first cousin marriage, Middle East, Arab countries, Morocco

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Background

Selecting a life partner is one of the most important and most complex decisions; it is shaped by personal and collective interests (*1*). The choice of a partner profoundly affects genetic distribution, structure and diversity within a population (*2*). A marriage is considered consanguineous when it unites 2 individuals who have a biological connection equivalent to second cousins or closer, with a consanguinity coefficient (F) ≥ 0.0156 (*3*). Consanguineous marriage patterns vary globally; in certain regions, particularly in Asia and notably India, uncle-niece marriages are practiced (*4*). Islamic traditions prohibit such unions, allowing only marriages between first cousins and double first cousins (F = 0.125) (*5*).

Consanguineous marriage has persisted for centuries (*6*) and currently involves over a billion people worldwide, with prevalence rates between 20% and 50% (*7*). The practice is widespread, from Pakistan and Afghanistan in the East to Morocco in the West, including North Africa, the Middle East, Central Asia, and South Asia (*6*). The highest rates are consistently observed in the Arab countries (*8,9*).

Consanguinity is primarily influenced by economic and social factors and it carries certain health risks for the offsprings, particularly increased risk of genetic diseases (*10*). Consanguinity is often linked to a range of factors, including socioeconomic status, sociocultural influences, religious beliefs, geographic location, and demographic attributes (*11,12*). Many studies have established a correlation between consanguineous marriage and increased occurrence of autosomal recessive disorders and congenital abnormalities, with 2.5 times higher risk among related than unrelated couples, and even higher (around 4.5%) for first cousins (*11*). Consanguinity also increases the occurrence of multifactorial conditions and can influence fertility rates, resulting in unfavourable pregnancy outcomes such as higher rates of pregnancy loss and preterm births (*11*).

Despite its detrimental health effects, consanguineous marriage continues to prevail in Morocco, as in numerous other Arab and Muslim nations, with a prevalence of 23.4% (*13*). To be able to propose efficient preventive measures, the public health sector requires a comprehensive understanding of the social and cultural factors contributing to consanguineous marriage in communities (*14*). Therefore, this study aimed to assess the prevalence of consanguinity in Settat Province, Morocco, and identify the predictive factors.

Methodology

This cross-sectional analytical study, conducted in Settat Province, Morocco, focused on married Moroccan women aged 18 years or older. Sampling was conducted in 2 steps: first, 2 primary health care centres (urban and rural) were randomly selected; second, a convenience sampling method was used to select and collect data from eligible women attending these centres. The sample size for the study was estimated at 326 participants to achieve 95% confidence level with 5% margin of error and 20% anticipated non-response rate. Ultimately, 453 participants were involved. The participants were divided into 2 categories: consanguineous and non-consanguineous couples, allowing for in-depth comparison between the 2 groups to determine the factors influencing consanguineous marriage.

Data were collected using a structured questionnaire developed after a review of relevant literature. After validation by experts and an ethics committee, the questionnaire was pretested among 30 women for clarity and cultural relevance. The reliability was confirmed with a Cronbach's alpha of 0.724, indicating good internal consistency. The questionnaire comprised 4 sections: (1) socio-demographic characteristics, including age, marital status, place of residence, education level, and professional status, with closed-ended and multiple-choice questions; (2) socio-economic status, covering household monthly income, spouse's profession, and socioeconomic status, measured using categorical scales; (3) anthropological characteristics, focusing on the type of marital alliance, and the type of consanguinity, with closed-ended and categorical responses; and (4) attitudes towards consanguineous marriage, assessing perceptions (favourable, neutral or unfavourable) and the existence of arranged marriages, using Likert scales and binary responses (Yes/No). The interviews lasted on average 15 minutes and were conducted face-to-face by trained interviewers who are fluent in the local language.

The data were analysed using SPSS version 26. Bivariate analysis, using chi-square or Fisher's exact tests, was conducted to identify significant associations with consanguineous marriage ($P < 0.05$). Multivariate analysis using logistic regression was performed to determine the predictive factors by comparing consanguineous and non-consanguineous groups. Potential confounding factors, including age, education level, household income, and place of residence, were controlled for in the multivariate analysis.

Ethics approval

This study was approved by the Ethics Committee of the Moroccan Association for Research and Ethics (approval number 3/REC/21) and conducted in accordance with the 1964 Declaration of Helsinki and its amendments.

Results

Among the 453 women, average age 38.04 ± 11.388 years, we found a consanguinity rate of 26.7% and an average consanguinity coefficient of 0.0145871. First-cousin marriage was the most common, at 69.4%.

Demographic and socioeconomic factors associated with consanguineous marriage in Settat

There was no consistent correlation between the ages of spouses and consanguineous marriage (Table 1). Age at first marriage was notably lower among individuals in consanguineous marriage, especially women; 63.6% married before age 20 years compared to 34.9% for non-consanguineous (P = 0.000). Consanguineous marriage was more common in urban areas (73.6%, P = 0.023) and among women with lower education levels (68.6%, P = 0.035). It was linked to low household income (<2800 MAD; 52.9%, P = 0.003) and reduced parental socioeconomic status for women (P = 0.015).

Factors influencing attitudes toward consanguinity in Settat Province

Individuals with consanguineous parents were more likely to support consanguinity for their offsprings, as found among husbands (27.3% vs 10.2%; P = 0.000) and wives (25.6% vs 16%; P = 0.021) (Table 2). Consanguinity was more prevalent in traditionally arranged marriages (73.6%) than in marriages based on choice or love (26.4%, P = 0.000). A favourable opinion about consanguineous marriage was significantly linked to higher prevalence of consanguinity (P = 0.000).

Determinants of consanguineous marriage in Settat Province

Women who married at 20–29 years were less likely to be in a consanguineous marriage than those who married before 20 years, while those who married at ≥ 30 years showed no significant difference (Table 3). Husbands who married at 25–29 years were 2.1 times more likely to have a consanguineous marriage than those who married later (P = 0.025).

Lower levels of education among women significantly predicted consanguinity. Couples who resided in urban areas were 2.5 times at higher risk of a consanguineous marriage than those who resided in rural areas (P = 0.004). Lower family income tripled the risk of consanguinity and traditional marriage arrangements significantly increased the likelihood of a consanguineous marriage (OR = 3.967; P = 0.000) than self-arranged marriages. Women who favoured inter-family marriage were 3 times more likely to be in a consanguineous union (OR = 2.785; P = 0.007). Having inbred parents increased the risk of a consanguineous marriage among husbands (OR = 3.318; P = 0.001).

Discussion

Our findings of 26.7% prevalence of consanguineous marriage in Settat is lower than reports from Tangier-Tetouan (39.4%) and Tiflet (38.9%), but higher than the national average (23.4%) and in areas like Rabat-Salé-

Table 1 Association of consanguinity with demographic and socioeconomic characteristics of women in Settat, Morocco

Characteristics	Women			Men		
	Consanguineous (n = 121) n (%)	Non-Consanguineous (n = 332) n (%)	*P* value	Consanguineous (n = 121) n (%)	Non-Consanguineous (n =332) n (%)	*P* value
Age (years)			0.65			0.55
< 20	2 (1 .7)	7 (2.1)		0	1 (0.3)	
20–29	35 (28.9)	80 (24.1)		14 (11.9)	35 (10.6)	
30–39	25 (20.7)	82 (24.7)		28 (23.7)	77 (23.3)	
40–49	41 (33.9)	102 (30.7)		33 (28)	85 (25.8)	
50–59	14 (11.6)	53 (16)		31 (26.3)	83 (25.2)	
⩾ 60	4 (3.3)	8 (2.4)		12 (10.2)	49 (14.8)	
Age at first marriage (years)			0.000			0.01
⩽ 19						
20–24	77 (63.6)	116 (34.9)		1 (0.8)	7 (2.1)	
25–29	33 (27.3)	138 (41.6)		30 (24.8)	67 (20.2)	
⩾ 30	4 (3.3)	58 (17.5)		57 (47.1)	115 (34.6)	
	7 (5.8)	20 (6)		33 (27.3)	143 (43.1)	
Education			0.035			0.40
No education	37 (30.6)	100 (30.1)		23 (19)	72 (21.7)	
Primary	46 (38)	84 (25.3)		37 (30.6)	99 (29.8)	
Preparatory	8 (6.6)	42 (12.7)		15 (12.4)	27 (8.1)	
Secondary	15 (12.4)	64 (19.3)		27 (22.3)	63 (19)	
University	15 (12.4)	42 (12.7)		19 (15.7)	71 (21.4)	
Place of residence			0.023			
Urban	89 (73.6)	206 (62)				
Rural	32 (26.4)	126 (38)				
Couple's place of residence during childhood			0.05			0.146
Urban	43 (35.5)	152 (45.8)		77 (63.6)	186 (56)	
Rural	78 (64.5)	180 (54.2)		44 (36.4)	146 (44)	
Occupation			0.60			0.40
Employee	2 (1.7)	14 (4.2)		26 (21.5)	61 (18.4)	
Public servant	6 (5)	25 (7.5)		17 (14)	70 (21.1)	
Liberal profession	5 (4.1)	9 (2.7)		22 (18.2)	58 (17.5)	
Day labourer	2 (1.7)	7 (2.1)		38 (31.4)	79 (23.8)	
Farmer	0	0		11 (9.1)	44 (13.3)	
Other	0	2 (0.6)		4 (3.3)	11 (3.3)	
Unemployed	121 (87.6)	275 (82.8)		3 (2.5)	9 (2.7)	
Household income (MAD)			0.003			
< 2800	64 (52.9)	117 (35.2)				
2800–6763	41 (33.9)	152 (45.8)				
> 6763	16 (13.2)	63 (19)				
Parents' socioeconomic level			0.015			0.79
Low						
Medium	47 (38.8)	84 (25.3)		43 (35.5)	84 (25.3)	
High	69 (57)	224 (67.5)		70 (57.9)	215 (64.8)	
	5 (4.1)	24 (7.2)		8 (6.6)	33 (9.9)	

MAD = Moroccan dirham

Table 2 Attitudes towards consanguineous marriage in Settat Province

Variable	Consanguine couples (n = 121) n (%)	Non-consanguine couples (n = 332) n (%)	*P* value
Parents of husband			0.000
Consanguine couple	33 (27.3)	34 (10.2)	
Non-consanguine couple	88 (72.7)	298 (89.8)	
Parents of woman			0.021
Consanguine couple	31 (25.6)	53 (16)	
Non-consanguine couple	90 (74.4)	279 (84)	
Attitude regarding consanguineous			0.000
marriage	74 (61.2)	72 (21.7)	
Positive	30 (24.8)	200 (60.2)	
Negative	17 (14)	60 (18.1)	
Neutral			
Arranged marriage			0.000
Yes	89 (73.6)	158 (47.6)	
No	32 (26.4)	174 (52.4)	

Table 3 Factors associated with consanguinity in Settat Province

Variable	*P* value	Odds ratio	Confidence interval (95%)	
			Lower	Higher
Wife's age at first marriage (years)				
⩽19 (ref.)				
20–24	0.004	0.410	0.222	0.757
25–29	0.001	0.121	0.035	0.414
⩾30	0.388	0.593	0.182	1.939
Husband's age at first marriage (years)				
⩽19	0.714	0.641	0.059	6.913
20–24	0.642	1.199	0.559	2.569
25–29	0.025	2.112	1.097	4.066
⩾30 (ref.)				
Wife's education level				
No education	0.002	0.165	0.052	0.524
Primary	0.050	0.335	0.112	1.002
Preparatory	0.002	0.114	0.029	0.443
Secondary	0.031	0.296	0.098	0.894
University (ref.)				
Place of residence of the couple				
Urban	0.004	2. 535	1.352	4.753
Rural (ref.)				
Household income				
< 2800 MAD	0.030	2.958	1.110	7.879
2800–6763 MAD	0.922	1.047	0.418	2.622
> 6763 (ref.)	0.004			
Arranged marriage				
Yes	0.000	3.967	2.131	7.385
No (ref)				
Attitude towards consanguinity				
Favourable	0.007	2.785	1.323	5.862
Against	0.009	0.352	0.161	0.768
Neutral (ref.)				
Parents of husband				
Consanguine couple	0.001	3.318	0.637	6.726
Non-consanguine couple (ref)				
Parents of woman				
Consanguine couple	0.475	1.275	0.654	2.486
Non-consanguine couple (ref)				
Socioeconomic level of wife's parents				
Low	0.273	2.065	0.565	7.542
Medium	0.853	1.123	0.331	3.814
High (ref.)				

Zemmour-Zaer (20%) and Gharb Chrarda Beni Hssen (19.81%) (*13,15-18*). It is lower than in Saudi Arabia (56%) and Algeria (38.8%), 2 other Arab nations (*19,20*). A key finding was the intergenerational occurrence of consanguinity. The rate of consanguineous marriage among the current generation was significantly higher than that of their parents: 26.7% vs 18.5% for women's parents ($P = 0.019$) and 26.7% vs 14.8% for men's parents ($P = 0.000$), indicating a persistent cultural practice (*21*).

Younger age at first marriage and low education level among women were strongly associated with higher consanguineous marriage rates, consistent with patterns observed in Morocco, Algeria, Oman, and some other Arab countries (*13,16,18,22-26*). Women with low education levels were more likely to enter consanguineous marriage (68.6%), a trend found in Morocco, Algeria, Egypt, and Yemen (*22,23,27,28*). Socioeconomic status influenced consanguineous marriage prevalence, with higher rates

among lower income households, similar to findings in Egypt, Palestine and Yemen (*13,26,27*). Economic benefits, such as reduced marriage costs, contribute to this association (*29*).

Contrary to other studies, consanguineous marriage was more prevalent in urban (73.6%) than rural (26.4%) areas in Settat (P = 0.023), likely due to rural-urban migration patterns (*16,18*). Unemployed women were more likely to enter consanguineous marriage, with 87.6% of women in consanguineous marriage in Settat being unemployed, a trend also reported in Oman, Jordan and Yemen (*23-25,27*). Employment, often associated with higher education levels and greater independence, reduces the likelihood of consanguineous marriage, and favourable opinions towards inter-family marriage and traditionally arranged marriages significantly increase consanguineous marriage rates, reflecting persistent cultural norms and parental influence (*30*).

Limitations and strengths of the study

This study has several limitations, including potential selection bias due to convenience sampling, recall bias in self-reported data and limited generalizability to other regions. The cross-sectional design prevents establishing causality. However, the strengths include the large sample size (453 participants), comprehensive multivariate analysis controlling for confounders, face-to-face interviews ensuring data quality, cultural relevance of the questionnaire, and ethics compliance. These strengths enhance the reliability and validity of the findings.

Conclusion

The prevalence of consanguineous marriage in Settat Province, Morocco, is notably high and influenced by a combination of factors. Awareness programmes and counselling are essential to educate individuals about the genetic and health risks and to reduce its prevalence. There is a need for policy support and more research on the subject.

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Prévalence des mariages consanguins et facteurs contribuants au Maroc

Résumé

Contexte : La consanguinité, qui résulte de la tradition du mariage entre membres d'une même famille, demeure courante dans de nombreux pays arabes et du Moyen-Orient, malgré ses risques bien connus pour la santé.

Objectif : Étudier la prévalence du mariage consanguin à Settat (Maroc), et les facteurs contribuants.

Méthodes : La présente étude analytique transversale a permis de recueillir des données sur le mariage consanguin auprès de 453 femmes marocaines mariées âgées de 18 ans ou plus, au moyen d'un questionnaire structuré administré par un enquêteur, et d'analyser ces données à l'aide du logiciel SPSS version 26.

Résultats : Nous avons constaté un taux de mariage consanguin de 26,7 % (coefficient de consanguinité moyen de 0,0145871) parmi les répondants, avec une majorité (69,4 %) de mariages entre cousins germains. La consanguinité était principalement influencée par la consanguinité des parents, les pratiques traditionnelles en matière de mariage, l'âge au moment du mariage, le niveau d'éducation, la résidence en milieu rural ou urbain et le statut socio-économique.

Conclusion : Nos résultats montrent que la consanguinité est encore répandue au Maroc en raison d'un ensemble de facteurs. Des interventions ciblées devraient être mises en œuvre pour renforcer la sensibilisation et les connaissances sur les risques sanitaires liés à la consanguinité, et réduire sa prévalence au sein de la population.

معدل انتشار زواج الأقارب في المغرب والعوامل المساهِمة فيه

خدوج الكندالي، ميلودة الشباب، مشهوري لطيفة، عبد الرؤوف هلالي

الخلاصة

الخلفية: لا يزال زواج الأقارب شائعًا في العديد من البلدان العربية وبلدان الشرق الأوسط، على الرغم من مخاطره الصحية المعروفة.

الأهداف: هدفت هذه الدراسة الى استكشاف معدل انتشار زواج الأقارب في مدينة سطات في المغرب، والعوامل المساهمة فيه.

طرق البحث: جمعت هذه الدراسة التحليلية المقطعية بيانات عن زواج الأقارب من 453 امرأة مغربية متزوجة تبلغ من العمر 18 سنة أو أكثر باستخدام استبيان منسَّق أداره محاورون، وحللت الدراسة البيانات بالإصدار 26 من برمجية SPSS.

النتائج: وجدنا أن معدل زواج الأقارب بلغ ٪26.7 (متوسط معامل زواج الأقارب 0.0145871) بين المشاركات في الاستبيان، وهي في الغالب حالات لزواج أبناء العمومة من الدرجة الأولى (٪69.4). ويتأثر زواج الأقارب في الغالب بقرابة الدم، وترتيب الزواج التقليدي، والسن في وقت الزواج، ومستوى التعليم، والإقامة في المناطق الريفية مقابل الحضرية، والوضع الاجتماعي والاقتصادي.

الاستنتاجات: تشير النتائج التي توصلنا إليها إلى أن زواج الأقارب لا يزال منتشرًا في المغرب لعدة أسباب. وينبغي تنفيذ تدخلات مُوجَّهة من أجل زيادة الوعي والمعلومات بالمخاطر الصحية المترتبة على زواج الأقارب، والحد من انتشاره بين السكان.

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