

Prevalence, Awareness and Perspective Associated with Consanguineous Marriage in Gaziantep, Türkiye: Descriptive-Cross-Sectional Study

Gaziantep'te Akraba Evliliğinin Yaygınlığı, Farkındalığı ve Bakış Açısı: Tanımlayıcı-Kesitsel Çalışma

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ABSTRACT Objective: Consanguineous marriage (CM) is a common practice in Türkiye. This cross-sectional study was conducted between 2020-2022 to determine the prevalence, current awareness, and perspective of CM and its relationship with socio-demographic and obstetric risk factors in Gaziantep, Türkiye. **Material and Methods:** A survey was developed that included a total of 35 questions and face-to-face interviews were conducted. A total of 1,007 married participants, 589 women and 418 men, aged 18-82 were included in the study. **Results:** The CM frequency was 30%, of which 24% were among fourth-degree relatives. Participants living in a nuclear family with low education level first marriage ages were low, perceived economic status was poor and had higher frequencies of CM ($p<0.001$). Spontaneous miscarriage, stillbirth, and a history of congenital abnormality were higher in CM than in those without CM ($p<0.05$). The primary reasons for individuals choosing CM were love (45%), family pressure (11%), traditional approaches (23%), and avoiding marrying outside the family (14%). Ninety-two percent of the participants were aware of the health hazards associated with CM including Down syndrome (50%), and congenital heart anomalies (33%). Fourteen percent of the participants found the number of centers providing genetic counseling services in our country sufficient. **Conclusion:** Despite the high percentage of participant awareness of the potential health defects related to CM, there continues to be a high percentage of CM; therefore, it is crucial to develop working strategies to prevent CM in Gaziantep, Türkiye.

Keywords: Awareness; consanguineous marriages; consanguinity; Gaziantep

ÖZET Amaç: Akraba evliliği (AE) Türkiye'de yaygın bir uygulamadır. Bu kesitsel çalışma, 2020-2022 yılları arasında Türkiye'nin Gaziantep ilinde AE'nin yaygınlığını, güncel farkındalığını ve bakış açısını ve bunların sosyodemografik ve obstetrik risk faktörleriyle ilişkisini belirlemek amacıyla yapılmıştır. **Gereç ve Yöntemler:** Toplam 35 sorudan oluşan bir anket geliştirilmiş ve yüz yüze görüşmeler yapılmıştır. Araştırmaya yaşları 18-82 arasında değişen 589'u kadın, 418'i erkek olmak üzere toplam 1.007 evli katılımcı dâhil edildi. **Bulgular:** AE sıklığı %30 olup, bunların %24'ü dördüncü derece akrabalardaydı. Eğitim düzeyi düşük, çekirdek ailede yaşayan katılımcıların ilk evlenme yaşları düşük, algılanan ekonomik durumları kötü ve AE frekansları daha yüksektir ($p<0,001$). Kendiliğinden düşük, ölü doğum ve doğuştan anormallik öyküsü; AE olanlarda, AE olmayanlara göre daha yüksektir ($p<0,05$). Bireylerin AE'yi tercih etmelerinin başlıca nedenleri arasında; sevgi (%45), aile baskısı (%11), geleneksel yaklaşım (%23) ve aile dışında evlenmekten kaçınma (%14) yer almıştır. Katılımcıların %92'si, Down sendromu (%50) ve konjenital kalp anomalileri (%33) dâhil olmak üzere AE ile ilişkili sağlık tehlikelerinin farkındadır. Katılımcıların %14'ü ülkemizde genetik danışmanlık hizmeti veren merkez sayısını yeterli bulmuştur. **Sonuç:** Katılımcıların AE ile ilgili olası sağlık kusurları konusundaki farkındalıklarının yüksek olmasına rağmen AE frekansı yüksek olmaya devam etmektedir. Bu nedenle, Türkiye'nin Gaziantep şehrinde AE'yi önlemeye yönelik çalışma stratejilerinin geliştirilmesi büyük önem taşımaktadır.

Anahtar Kelimeler: Farkındalık; akraba evlilikleri; kan yakını; Gaziantep

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Consanguineous marriage (CM) is described as a relationship between two blood-related partners.¹ CM is a worldwide practice, and its prevalence is related to different factors such as ethnicity, religion, education, socioeconomic status, and a familial pattern toward early marriages.²⁻⁴ Although the incidence of CM tends to decrease with urbanization and modernization, it is still practiced frequently.⁴ It is practiced by more than one billion of the world's population with rates reaching 20-50%.⁵

Inbreeding most commonly occurs between first cousins, where partners share one-eighth of the genes they inherited from a common ancestor.⁶ Due to the combination of these common alleles, CM can have adverse effects on mothers, their children, their families, and society, leading to genetic disorders, poor pregnancy outcomes, or reproductive and fertility outcomes. It has been reported that there is a strong association between CM and increased rates of stillbirth, increased mortality, and congenital malformations.⁷⁻⁹ Also reported in those marriages were a decreased preference for contraception, increased childbearing age, and higher fertility.¹⁰ Consanguineous partners should receive screening similar to the genetic screening recommended for any partner of their own ethnic group, and in addition to prenatal screening, their newborns should be screened for hearing loss and congenital metabolic disorders.^{11,12} Recommendations regarding CM also focus on informing partners about possible health consequences and providing genetic counseling before conception.^{13,14}

CM is a common practice in Türkiye, especially in the Middle East region, where Gaziantep is located. Only a few small-scale studies have attempted to determine the prevalence, socioeconomic, and birth-related effects of CM in Gaziantep. More information is needed on the socio-demographic factors, cultural factors, and awareness level on the subject to develop and implement public health interventions targeting CM. Hence, this study aims to determine the prevalence, current awareness, and perspective of CM and its relationship with socio-demographic and obstetric risk factors in Gaziantep. The hypothesis of the study is that there is no difference between individuals who have CMs and those

who do not in terms of socio-demographic characteristics, awareness, perspective, and obstetric risk factors (H0).

MATERIAL AND METHODS

This is a descriptive and cross-sectional study that was conducted between 2020 and 2022. The population of the research consisted of outpatients and relatives who applied to SANKO University Hospital due to various complaints. One thousand and seven of these individuals were randomly selected and included in the study by asking whether they were married or not. This study was approved by the SANKO University Clinical Research Ethics Committee (date: July 2, 2020; no: 2020/11-03). All participants provided informed consent according to the principles of the Declaration of Helsinki.

Face-to-face interviews were conducted by 20 medical faculty students under the supervision of an academic advisor. A survey was developed that included a total of 35 questions. The first part of the survey consists of questions related to demographic data such as age, gender, education level, place of residence, family size, and obstetric characteristics. The second part consisted of questions about CM and its degree and, the history of CM in the family, followed by the level of awareness of its possible negative effects on the offspring.

Data were analyzed using IBM SPSS 23.0 software. Descriptive analysis, percentage distribution, mean, and standard deviation, and grouped variable comparison, chi-squared were employed. $P < 0.05$ was considered of statistical significance.

RESULTS

A total of 1,007 individuals, 59% ($n=589$) female and 42% ($n=418$) male, were included in the study. Mean age was 43.51 ± 12.55 years. The overall prevalence of CM was 30% ($n=297$) among the participants. Of these, 6% were marriages to a second-degree relative ($n=16$) and 2% to a third-degree relative ($n=5$), while the rest of the participants stated that their relations to their partners were in the fourth-degree or further. A statistically significant difference was found between those who had CM and those who did not, according

to age, education level (in both female and male participants), age at marriage, family type, income level, and place of residence ($p < 0.001$) (Table 1). Spontaneous miscarriage, stillbirth, and a history of congenital abnormality were higher in CM than in those without CM ($p < 0.05$) (Table 2). Among CM, the number of participants who had a prenatal genetic screening test for themselves or their partners' during pregnancy was 20% ($n = 58$).

While there was a statistically significant difference in terms of educational status and employment status in female participants with and without CM ($p < 0.001$), there was a significant difference in male participants in terms of educational status ($p < 0.001$), but there was no difference in terms of employment status ($p = 0.96$).

When asked about their reasons for choosing CM, 45% ($n = 130$) stated that they got married out of

love, 23% ($n = 67$) stated that it was a traditional practice in the family, 14% ($n = 40$) stated that they didn't want to marry outside the family, 11% ($n = 31$) stated that there was pressure from family members. Twenty percent of those ($n = 59$) who married consanguineously stated that they did it against their will and 11% ($n = 33$) stated that they regretted it. When those who did not marry voluntarily ($n = 59$) were examined, it was determined that 31 of them were due to family pressure and the remaining 28 were due to traditions. This situation reveals that even if the marriages are made due to traditions, 14% of them take place at the individuals' own will. In addition, it was concluded that all of those who got married due to family pressure ($n = 31$) regretted having married relatives.

The rate of CM in the participants' parents was 39% ($n = 393$). On the other hand, 28% ($n = 276$) of the

TABLE 1: Distribution of participants by consanguinity status and individual characteristics.

Characteristic	CM n (%)	NCM n (%)	p value
Age ($n = 1,002$)			
<30	34 (11.4)	104 (14.8)	<0.001
30-39	51 (17.2)	229 (32.5)	
40-49	82 (27.6)	203 (28.8)	
>50	130 (43.8)	169 (24)	
Education status ($n = 1,002$)			
Illiterate	24 (8.1)	18 (2.5)	<0.001
Literate	29 (9.8)	27 (3.8)	
Primary school	83 (28)	123 (17.4)	
Intermediate	61 (20.6)	82 (11.6)	
High school	56 (18.9)	200 (28.3)	
College degree or above	43 (14.5)	256 (36.3)	
Income status perception ($n = 1,002$)			
Income less than expenses	111 (37.5)	198 (28.1)	<0.001
Income equals expenses	136 (45.9)	309 (43.8)	
Income more than expenses	49 (16.6)	198 (28.1)	
Age at marriage ($n = 1,002$)			
<20	102 (34.3)	148 (21)	<0.001
20-29	181 (60.9)	499 (70.9)	
>30	14 (4.7)	57 (8.1)	
Family type ($n = 1,003$)			
Nuclear	201 (67.7)	575 (81.4)	<0.001
Extended	96 (32.3)	131 (18.6)	
Settlement location ($n = 1,003$)			
Rural	69 (19.9)	45 (6.4)	<0.001
Urban	238 (80.1)	661 (93.6)	

CM: Consanguineous marriage; NCM: Nonconsanguineous marriage.

TABLE 2: Distribution of female participants and male participants' partners by consanguinity and birth characteristics

Characteristic	CM n (%)	NCM n (%)	p value
Number of children (n=1,001)			
0	19 (6.4)	73 (10.4)	<0.001
1	35 (11.8)	150 (21.3)	
2	44 (14.8)	207 (29.4)	
3	84 (28.3)	153 (21.7)	
>4	115 (38.7)	121 (17.2)	
Spontaneous abortion (n=983)			
No	194 (66.9)	520 (75)	0.009
Yes	96 (33.1)	269 (25)	
Stillbirth (n=982)			
No	221 (76.2)	622 (89.9)	<0.001
Yes	69 (23.8)	70 (10.1)	
Congenital abnormality (n=921)			
No	210 (75.3)	616 (96)	<0.001
Yes	69 (24.7)	26 (4)	

CM: Consanguineous marriage; NCM: Nonconsanguineous marriage.

participants said that they would allow their children to marry among relatives.

Ninety-two percent of the participants (n=923) were aware of the health hazards of CM among offspring. When asked about the options for which diseases it could cause; awareness about Down syndrome, congenital heart anomalies, Mediterranean anemia and cleft palate were 50%, 34%, 29% and 27% respectively, and 27% answered "I don't know". Regarding hazards 69% of participants got their information from friends or family, and 32% from healthcare providers.

Twenty percent (n=58) of CM stated that they had a test for CM. While 14% of participants (n=142) believed the number of centers providing genetic counseling services in our country was sufficient, 44% (n=440) admitted it was not, and 42% (n=425) stated they were unaware of it. Forty-five percent of those surveyed indicated that those in CMs should seek genetic counseling.

DISCUSSION

Although there has been a significant decrease in the prevalence of CMs around the world in the last fifty years, it continues to be a frequently encountered social phenomenon, across ethnic and religious groups.^{15,16} Today, it is estimated that approximately

20% of the world's population lives in a family that started with CM.¹⁷ A significant portion of these marriages take place between relatives, especially in North Africa, the Middle East, South and Central Asia.^{2,18,19}

In studies conducted in different parts of the world, the prevalence of CM varies widely, from 20% to 58%, under the influence of various social and cultural factors.²⁰⁻²⁴ In studies conducted in different regions of Tu, this rate varies between 18% and 34%.²⁵⁻²⁹ Our study results revealed that 30% of the participants had a history of CM. These rates can be attributed to parents' literacy, socioeconomic status, beliefs, and parental influence on marriage decisions in the regions. More than half of CM in Türkiye are first-cousin marriages.^{27,30} It is estimated that the risk of genetic and congenital disorders in children of first cousins is twice as high as in the general population.¹² CM is preferred for reasons such as protecting assets and preventing strangers from entering the family.²⁷ In this study, it was determined that 24% of CM were among fourth-degree relatives, and similarly, 4% of those who married consanguineously did so to avoid marrying out of family and 0.9% to avoid dividing their assets.

The marital ages of participants with CMs were found to be lower than those of those without CMs

in this study ($p < 0.001$). Although early marriage has a multifactorial etiology, consanguinity through previous acquaintance may have played a critical role here. In addition, the education levels of those who married consanguineously were low ($p < 0.001$) (Table 1). Similarly, some studies emphasize the relationship between education level, age at marriage, and CM.^{26,27,30} This finding reinforces the importance of knowledge in making sound life decisions. Increasing education levels will help individuals implement their choices without bowing to the pressure of other family members. The prevalence of CM was found to be significantly higher in rural areas ($p < 0.001$) which may be due to the greater cultural influence of parents and relatives in favor of CM compared to urban areas, as well as lower educational attainment. As an inevitable consequence of our country's recent advancement, the rate of nuclear families has ascended, while the rate of extended families has gradually declined (TUIK.2022). Our study revealed that the frequency of CM among participants living in nuclear families was approximately 2 times higher than those living in extended families (Table 1). This conclusion contradicts many research in the literature.^{27,31} These results suggested that modernization did not influence the orientation toward CM.

It was determined that 32% of the female participants were employed in a job, and the employment status of female participants with CM was found to be statistically lower than those without CM ($p < 0.001$), while no significant difference was detected in the male participants. This result shows that providing women with the opportunity to acquire a profession and participate in the workforce will increase their autonomy in marriage decisions. Also, it has been shown that there is a significant relationship between decreasing income level and CM ($p < 0.001$). There are a multitude of studies in the literature that support this finding.^{26,27,32}

Additionally, CM reduces inter- and intra-population genetic diversity, which increases abnormalities caused by the introduction of deleterious genes in these groups.³³ Such marriages have a significant impact on recessive diseases and can increase polygenic or multifactorial diseases, infertility, sponta-

neous abortions, stillbirths, infant mortality, and congenital malformations. Previous studies have shown that CM increases the obstetric risks of women in terms of spontaneous abortion and stillbirth.^{34,35} In this study, we also found a significant difference between those who had CM and those who did not in terms of spontaneous miscarriage ($p = 0.009$) and stillbirth ($p < 0.001$) (Table 2). Only 20% of CM stated that they had a test for this type of marriage. In this context, it is important to provide genetic counseling services to couples in CM, starting from the pre-pregnancy period.

Today, the increase in knowledge about genetic diseases and their inheritance and the fact that many genetic diseases do not yet have a treatment have made it necessary to provide genetic counseling services within primary healthcare services. The rate of using these services is higher in developed countries than in developing countries. In developed countries, genetic counseling services are provided in medical faculties, public hospitals, private hospitals, clinics, and some private institutions by medical geneticists, psychologists, social workers, and nurses with genetic counseling certificates. In our country, genetic counseling services, including prenatal and postnatal analyses, are provided in medical genetics departments of various medical faculties, private hospitals, and institutions. According to February 2023 data, there are a total of 55 private genetic diseases evaluation centers licensed by the Ministry of Health in 8 provinces. Gaziantep is not among the provinces with such a center. Considering that the rate of participants who think that the number of centers providing genetic counseling services is sufficient in our country is quite low (14%), it is important to increase awareness on this issue and plan genetic counseling services within the primary health care services for CM especially in Gaziantep.

The overall awareness regarding that CM may cause health problems for offspring (92%) was higher than in previous studies (18.7%).¹ Contrary to assumptions based on this data, the determined CM rate in this study is much higher. The persistence of CM, a traditional form of marriage, despite the modernization, urbanization, and income increase generated by Türkiye's intensive socio-demographic, eco-

conomic, and cultural transformation process over the last 50 years, creates a critical situation that needs to be explained.

CONCLUSION

Gaziantep, located in the Southeastern Anatolia region of Türkiye, ranks 27th out of 81 provinces in terms of the number of individuals in CM by province, according to the 2021 data of the Turkish Statistics Institute. To our knowledge, this is the first study to assess the prevalence, awareness, and perspective of CM specific to Gaziantep. Programs to inform individuals about the disadvantages of inbreeding are needed to reduce its prevalence in this population where there is a strong preference for family traditions and values. It is vital for the public health field to have a thorough understanding of these factors to develop an appropriate response to CM in Gaziantep. Increasing public literacy on consanguinity could be achieved by providing proper education and training to primary healthcare workers on all health and social issues related to consanguinity. The number of centers where consultancy services can be received in Gaziantep is non-existent. It should be en-

sured that all couples living in Gaziantep who want to marry consanguineously or have a family history of hereditary diseases have fair access to genetic counseling services.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Elif Onur; **Design:** Elif Onur, Pınar Günel, Özlem Soran; **Control/Supervision:** Özlem Soran; **Data Collection and/or Processing:** Emine Gökçe Çetin, Sena Sarı; **Analysis and/or Interpretation:** Pınar Günel, Elif Onur; **Literature Review:** Elif Onur; **Writing the Article:** Elif Onur; **Critical Review:** Özlem Soran.

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