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Hassan Abu Saad  
*Al-Qasemi Academic College of Education, Israel*

Salman Elbedour  
*Howard University*

Eyad Hallaq  
*Al-Quds University, Israel*

Joav Merrick  
*University of Kentucky*

Ariel Tenenbaum  
*National Institute of Child Health and Human Development, Israel*

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Authors
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Consanguineous marriage and intellectual and developmental disabilities among Arab Bedouins children of the Negev region in Southern Israel: a pilot study

Hassan Abu Saad1,2,3, Salman Elbedour4, Eyad Hallaq5, Joav Merrick6,7,8,9 * and Ariel Tenenbaum6,8

1 Al-Qasemi Academic College of Education, Baha Al-Gharbiye, Israel
2 Negev Regional Center for Research Development, Beersheva, Israel
3 KAYE Academic College of Education, Beersheva, Israel
4 Department of Human Development and Psychoeducational Studies, School of Education, Howard University, Washington, DC, USA
5 Department of Psychology, Al-Quds University, Jerusalem, Israel
6 National Institute of Child Health and Human Development, Jerusalem, Israel
7 Health Services, Division for Intellectual and Developmental Disabilities, Ministry of Social Affairs and Social Services, Jerusalem, Israel
8 Division of Pediatrics, Hadassah-Hebrew University Medical Center, Mt. Scopus Campus, Jerusalem, Israel
9 Kentucky Children’s Hospital, University of Kentucky College of Medicine, Lexington, KY, USA

*Correspondence: jmerrick@zahav.net.il

INTRODUCTION

In this article, we present data from two special education schools that serve the Arab Bedouin population in the Negev region in southern Israel. Data were collected on 221 children (53.8% female and 46.2% male) with moderate and severe intellectual and developmental disability (IDD) in order to assess the extent of consanguineous marriage in these children. Findings showed that 61.5% of all the participants were offspring of parents who were biologically related, both first and second cousins. Almost 70% of the participants were diagnosed with moderate IDD, 20% with severe IDD, and 10% diagnosed with other developmental disorders. It is recommended to further investigate this population for a more detailed history and specific genetic disorders for appropriate genetic counseling for those already married and also to focus public health efforts to decrease the rate of marriages between relatives.

Consanguinity is a well-known risk factor for genetic disorders, including diseases and syndromes that present with intellectual and developmental disabilities. This is due to autosomal recessive disorders and also other inherited disorders. The vast majority of the behavioral genetics studies, which for the most part have focused on twins and adoptees (1, 2) have been conducted in highly industrialized western societies such as the United States and Northern European countries.

Despite the important and influential research undertaken on the impact of genetics and consanguineous marriage and the extent to which public awareness has been raised by these findings, only a limited number of investigations have been carried out in collective, non-western societies (e.g., Africa, Asia, and the Middle East) and there is scant empirical evidence regarding the genetic influence of consanguineous marriage in these societies. In these societies, consanguineous marriage is a common feature. There is, for example, a long tradition of such marriages in Japan, India, Sudani tribes, and Arab societies (3–5). Consanguineous marriage is also commonplace in the population of about 200,000 Bedouin Arabs living in the Negev desert in the south of Israel.

Studies conducted in Indian rural and urban populations showed a higher frequency of consanguineous marriages in rural compared with urban communities (9, 10). One study (11) showed that about 50% of all marriages in the rural population were consanguineous marriages with 52.6% of these consanguineous marriages involving first cousin; whereas, in the urban area, consanguineous marriages accounted for about 30% of the total number of marriages, with 60.9% of these marriages involving first cousin relationships.

Research indicates that a large segment of the world population practices certain forms of “inbreeding.” According to Bittles (5), 20–50% of all marriages occur between biologically related people in parts of Central, South, and West Asia and North Africa. The most popular matches are between first cousins, double first cousins (where the spouses share both sets of grandparents), or uncles and nieces. Although less than 1% of marriages are consanguineous in North America and Europe, up to 10% of marriages in East and West Africa and South America are between kin. The percentages could also be high in rapidly growing populations in Middle Africa, the Caribbean, Central America, East Asia, and Southeast Asia, for which no reliable figures exist.

Changes in culture and the influence of the Western World also affect the rate of consanguineous marriage resulting in a decrease today (12). Among parents of 14,237 newborns in Bahrain in 2008–2009, the total consanguinity and first cousin marriage rates over a period of 4 months in 2008 were 10.9 and 6.9% respectively;
As many of these marriages are set between relatives, the incidence of consanguineous couples raises the question about the public awareness of the health risks associated with this practice. A recent study (17) from Brazil in a house-to-house population-based survey in the state of Parába, 20,462 couples were interviewed regarding kinship relationship, number of siblings, and offspring affected by intellectual or physical disabilities. The rate of consanguineous unions in the communities ranged from 6 to 41%. The overall average inbreeding coefficient \( F \) was 0.00602 ± 0.00253, ranging from 0.00134 to 0.01182. Communities situated on the backlands had an increased average value of \( F \) compared to those closer to the seashore \( (P = 0.024) \). The average rate of disabled offspring varied from 2.96 ± 0.68% for unrelated couples to 10.44 ± 16.86% for related couples at the level of double first cousins or uncle–niece.

The above research examples show that marriage in the family increases the risk of disability. The Bedouin Arabs of the Negev in southern Israel have practiced cousin marriages for generations as a part of their cultural tradition. The exact rate of consanguineous marriages in this population is unknown. According to behavioral genetics theory, this type marriage puts the offspring at risk for a variety of genetically influenced disorders. Consequently, such children are likely to have lower cognitive ability including different degrees ofIDDs in addition to genetic disease along with these disorders.

In conclusion, it is recommended to further investigate this population for a more detailed history and specific genetic disorders for appropriate genetic counseling for those already married and also to focus public health efforts to decrease the rate of marriages between relatives.

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