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Effectiveness of Multidisciplinary Instructional Intervention (MDII) on Knowledge and Attitude Regarding Consanguineous Marriage and its Effect among Degree Students

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Abstract: ***Introduction: Consanguineous marriage, a union between closely related individuals, is common in several cultures but increases the risk of genetic disorders due to the inheritance of harmful recessive genes. These disorders place a long-term burden on individuals and communities. Educating young adults is essential to promote awareness and informed decision-making. Objectives: The study aimed to assess the knowledge and attitude of degree students regarding consanguineous marriage and its effects, evaluate the effectiveness of a Multidisciplinary Instructional Intervention by comparing pre- and post-test scores, determine the correlation between knowledge and attitude, and identify associations between selected demographic variables and pre-test scores. Methods: A one-group pre-test post-test design was used, involving 70-degree students selected through non-probability consecutive sampling. Data were collected using structured tools. A 7-day Multidisciplinary Instructional Intervention was conducted involving health educators, genetic counsellors, and social workers. Post-test data were collected and analyzed using descriptive and inferential statistics. Ethical guidelines were strictly followed. Results: The mean post-test knowledge score (70.26%) was significantly higher than the pre-test score (41.57%). Similarly, post-test attitude scores (81.28%) showed significant improvement from the pre-test (44.54%) ($p < 0.05$). No correlation was found between knowledge and attitude. Significant associations were noted between place of residence and knowledge, and between family income and attitude. Discussion: Multidisciplinary Instructional Intervention significantly improved students' knowledge and attitudes regarding consanguineous marriage. The multidisciplinary approach improved learning outcomes and awareness. Conclusion: Multidisciplinary Instructional Intervention is an effective method for improving awareness and promoting informed attitudes among degree students on consanguineous marriage.***

Keywords: Consanguineous marriage, knowledge, attitude, multidisciplinary instructional intervention, genetic disorders, degree students

1. Introduction

Marriage is a fundamental social institution that influences family structure, health, and community well-being. In many parts of the world, including India, marriages between biologically related individuals, known as consanguineous marriages, continue to be practiced because of long-standing cultural traditions, family values, and social acceptance. The prevalence of consanguineous marriage varies considerably across regions, with higher rates reported in South Asia, the Middle East, and North Africa. In India, approximately 14% of marriages are consanguineous, with the highest prevalence observed in South India.[1] Consanguinity refers to a union between individuals who share a common ancestor, such as first or second cousins. Although these marriages are culturally accepted in many communities, they increase the likelihood that both partners carry the same recessive genes, thereby increasing the risk of inherited genetic disorders in their offspring. The degree of genetic relatedness between parents determines the probability of transmitting inherited recessive disorders to their children.[2,3] Studies have shown that children born to consanguineous couples are at greater risk of congenital anomalies, inherited metabolic disorders, developmental disabilities, neonatal mortality, and other adverse pregnancy and birth outcomes, including low birth weight and preterm birth. [4,6]

Despite the established health implications, consanguineous marriage remains common because it is influenced by cultural beliefs, family traditions, socioeconomic status, educational level, and geographic location. Therefore, awareness regarding its potential health consequences should be promoted in a culturally sensitive and evidence-based manner. Young adults, particularly degree students, are at an important stage of life where they begin making decisions related to marriage and future family planning. However, many students have limited knowledge about the genetic consequences of consanguinity and may not fully understand its long-term impact on individuals, families, and society. Providing appropriate educational interventions during this period can improve awareness, encourage positive attitudes, and support informed decision-making regarding reproductive and genetic health. [7,8]

Multidisciplinary educational approaches, involving the expertise of health educators, genetic counsellors, and social workers, offer a comprehensive means of addressing the medical, genetic, psychological, and social aspects of consanguineous marriage. Such interventions can enhance

learners' understanding through evidence-based and interactive teaching strategies, thereby promoting informed attitudes and responsible health-related decisions. In this context, the present study aimed to evaluate the effectiveness of a **Multidisciplinary Instructional Intervention (MDII)** in improving the knowledge and attitudes of degree students regarding consanguineous marriage and its effects. Specifically, the study assessed baseline knowledge and attitudes, compared pre-test and post-test scores following the intervention, examined the relationship between knowledge and attitude, and determined the association of selected demographic variables with pre-test knowledge and attitude scores. The findings are expected to contribute to strengthening genetic health education and support the development of effective educational programmes for young adults. [7,8]

2. Methodology

Study Design and Setting

The present interventional study was conducted among degree students at Government First Grade College for Women, Hassan, Karnataka. A one-group pre-test–post-test design was used to assess the effectiveness of the MDII on knowledge and attitude regarding consanguineous marriage and its effects.

Study Population

The study population consisted of degree students studying at Government First Grade College for Women, Hassan, Karnataka.

Sample Size and Sampling Technique

A total of **70-degree students** participated in the study. Participants were selected through **non-probability consecutive sampling**.

Data Collection Instruments

Data were collected using a structured knowledge questionnaire and a structured attitude scale. The tools included socio-demographic information, a knowledge questionnaire, and an attitude scale regarding consanguineous marriage and its effects.

The knowledge questionnaire assessed areas such as the meaning and types of consanguineous marriage, its effects, and associated health problems. The attitude scale was used to assess the participants' attitudes towards consanguineous marriage and its effects.

Validity and Reliability

The research tools and the Multidisciplinary Instructional Intervention were reviewed by subject experts to establish content validity. Necessary modifications were made based on their suggestions.

The reliability of the structured knowledge questionnaire and attitude scale was assessed before the main study. The tools demonstrated satisfactory reliability and were considered suitable for data collection.

Data Collection Procedure and Ethical Considerations

Before data collection, the purpose and procedure of the study were explained to the participants, and informed consent was obtained. A pre-test was conducted before the intervention to assess the baseline knowledge and attitude of the participants.

A 7-day MDII was then provided with the involvement of health educators, genetic counsellors, and nursing-based instruction, gynecological and medical content, audiovisual teaching, interactive discussion, and a combination of instructional methods.

The intervention included teaching, audiovisual presentations, and interactive discussions. Following the intervention, a post-test was conducted to assess changes in knowledge and attitude using the same research tools.

Confidentiality and privacy of the participants were maintained throughout the study. Ethical principles were followed during all stages of the research.

Statistical Analysis

The collected data were analyzed using descriptive and inferential statistics. Frequency and percentage were used to describe the socio-demographic characteristics of the participants. A paired *t* test was used to compare pre-test and post-test knowledge and attitude scores and to assess the effectiveness of the MDII. Karl Pearson's correlation coefficient was used to determine the relationship between knowledge and attitude scores. The Chi-square test was used to determine the association between selected variables and the study outcomes.

3. Results

Table 1: Socio-demographic characteristics of study participants (N=70)

S. No	Socio Demographic Variables	Categories	Frequency	Percentage (%)
1	Age	18-19years	27	38.6%
		20-21years	20	28.6%
		22years	15	21.4%
		23years	8	11.4%
2	Religion	Hindu	32	45.7%
		Muslims	19	27.1%
		Christians	18	25.7%
		Others	1	1.4%
3	Type of family	Nuclear	23	32.9%
		Joint	39	55.7%
		Extended	8	11.4%
4	Educational status of Father	No formal education	25	35.7%

		Primary education	17	24.3%
		PUC	17	24.3%
		Degree and above	11	15.7%
5	Educational status of Mother	No formal education	27	38.6%
		Primary education	20	28.6%
		PUC	16	22.9%
		Degree and above	7	10.0%
6	Family monthly income	5000-10000	10	14.3%
		11000-15000	13	18.6%
		16000-20000	25	35.7%
		Above 20000	22	31.4%
7	Place of residence	Urban	18	25.7%
		Rural	30	42.9%
		Semi urban	21	30.0%
8	Source of information	Mass media	19	27.1%
		Magazine	5	7.1%
		Health personnel	46	65.7%

The majority were aged 18–19 years (38.6%), belonged to the Hindu religion (45.7%), and lived in joint families (55.7%). Most fathers (35.7%) and mothers (38.6%) had no formal education. Over one-third (35.7%) reported a monthly family income of ₹16,000–20,000, while 43.0% resided in rural areas. The primary source of information regarding consanguineous marriage was health personnel (65.7%), followed by mass media (27.0%).

Table 2: Pre-test and Post-test level of knowledge among degree students. (N=70)

Knowledge			Pre-test Participants Frequency (%)	Post-test Participants Frequency (%)
Level	Scores	Percentage		
Inadequate	0-14	<50%	65 (92.85)	0 (0)
Moderate	15-22	51-75%	5(7.15)	28 (40)
Adequate	23-30	>75%	0 (0)	42 (60)
Total			70 (100)	70 (100)

Table- 2 depict that in the pre-test the levels of knowledge regarding selected aspects of consanguineous marriage and its effect, in 70 respondents 65(92.85%) had inadequate and 5(7.15%) had moderate knowledge. Whereas, in post-test level of knowledge regarding selected aspects of consanguineous marriage, majority 42 (60%) of respondents were having Adequate knowledge and 28 (40%) were having moderate knowledge and none of them had Inadequate knowledge.

Table 3: Comparison between pre-test and post-test levels of knowledge among degree students (N=70)

Knowledge			No. of study participants		Percentage of frequency	
Level	Scores	Percentage	Pre Test	Post Test	Pre Test	Post Test
Inadequate	0-14	<50%	65	0	92.85%	0.00%
Moderate	15-22	50-75%	5	28	7.15%	40.00%
Adequate	23-30	>75%	0	42	0.00%	60.00%
Total					100.00%	100.00%

Table 3 shows the comparison between pre-test and post-test percentage of knowledge level of respondents regarding consanguineous marriage and its effect. In that 92.85% of respondents had inadequate knowledge and 7.15% had moderate knowledge in the pre-test whereas in post-test none of them had inadequate knowledge, 60% had adequate knowledge and 40% had moderate knowledge. These findings are suggestive of significant improvement in the knowledge level of degree students.

Table 4: Mean, Mean%, SD and CV of overall pre-test, post-test and enhancement knowledge scores among degree students (N=70)

	Minimum	Maximum	Range	Mean	mean%	Std. Deviation	co-efficient of variance	Paired t Test Value
Pretest	8	18	10	12.47	41.57%	1.38	11.06%	39.74 (S) P<0.0001, df=69
Post- Test	16	25	9	21.15	70.26%	1.54	7.28%	
Enhancement	4	13	9	8.55	28.77%	2.46	28.77	

(S)= Significant at 0.05 Level t (0.05, 69df) =2.00

Table 4 depicted the overall pre-test and post-test knowledge of respondents regarding consanguineous marriage. The respondents mean percent of knowledge scores was 41.57% in pre-test and 70.26% in post-test with an enhancement of 28.77%. The calculated paired 't' test value is 39.74% which is greater than the table value (t_{69} = 2, at 0.05 level of significance). Hence the stated null hypothesis $\mathbf{H_{01}}$ was rejected and research hypothesis $\mathbf{H_1}$ was accepted. It was concluded that the MDII is effective, in enhancing the knowledge of degree students regarding consanguineous marriage and its effect.

Table-5: Pre-test and post-test level of attitude among degree students (N=70)

Attitude			Pre-test Participants Frequency (%)	Post-test Participants Frequency (%)
Level	Scores	Percentage		
Unfavourable	0-24	<50%	41(58.57)	0 (0)
Moderate	25-37	50-75%	29 (41.43)	4 (5.72)
Favourable	38-50	>75%	0 (0)	66 (94.28)
Total			70 (100)	70 (100)

Table-5 depict that in the pre-test the levels of attitude regarding consanguineous marriage, in 70 respondents 41(58.57%) had unfavourable and 29(41.43%) had moderate attitude whereas in post test level of attitude regarding selected aspects of consanguineous marriage and its effect, majority 66 (94.26%) of respondents were having favorable attitude and 4 (5.72%) were having moderate attitude and none of them had unfavourable attitude.

Table 6: Comparison between pre-test and post-test levels of attitude among degree students (N=70)

Attitude			No. of Study Participants		Percentage of Frequency	
Level	Scores	Percentage	Pre Test	Post Test	Pre Test	Post Test
Unfavourable	0-24	<50%	41	0	58.57%	0.00%
Moderate	25-37	50-75%	29	4	41.43%	5.72%
Favourable	38-50	>75%	0	66	0.00%	94.28%
Total			70	70	100.00%	100.00%

Table 6 shows the comparison between pre-test and post-test percentage of attitude level regarding consanguineous marriage and its effect. 41(58.57%) of respondents had unfavourable attitude and 29(41.43%) had moderate attitude in the pre-test, whereas in post-test none of them had unfavourable attitude, 66(94.28%) had favourable attitude and 4(5.72%) had moderate attitude.

Table 7: Mean, Mean%, SD and CV of overall pre-test, post-test and enhancement attitude scores among degree students (N=70)

	Minimum	Maximum	Range	Mean	mean%	Std. Deviation	co-efficient of variance	Paired t Test Value
Pretest	18	27	9	22.27	44.54%	2.14	9.61	69.38 (S)
Posttest	36	45	9	40.64	81.28%	1.59	3.91	P<0.0001, df=69
Enhancement	11	25	14	18.01	36.02%	3.99	22.15	

(S)= Significant

Table 7 depicted the overall pre-test and post-test attitude of respondents regarding consanguineous marriage. The respondents mean percent of attitude scores was 44.54% in pre-test and 81.28% in post-test with an enhancement of 36.02%. The calculated paired 't' test value is 69.38 which is greater than the table value (t_{69} = 2, at 0.05 level of significance). Hence the stated null hypothesis $\mathbf{H_{01}}$ was rejected and research hypothesis $\mathbf{H_1}$ was accepted. It was concluded that the MDII is effective, in enhancing the attitude of degree students regarding consanguineous marriage and its effect.

Table 8: Correlation between overall knowledge and attitude scores among degree students (N=70)

	MEAN		MEAN %		Pearson Correlation Co-Efficient
	Knowledge	Attitude	Knowledge	Attitude	
Pretest	12.47	22.27	41.57%	44.54%	0.550 (S)
Posttest	21.15	40.64	70.26%	81.28%	0.494 (S)

(S)= Significant at 0.05 Level

Table 8 shows the correlation between overall knowledge and attitude scores among degree students regarding consanguineous marriage. The respondents mean percent of knowledge scores was 41.57% and attitude scores was 44.54% in pre-test and 70.26% knowledge and 81.28% attitude in post-test.

The calculated correlation coefficient values are greater than the table values at 0.05 level of significance. Hence stated Research Hypothesis $\mathbf{H_2}$ is accepted and null hypothesis H_{02} is rejected.

Table 9: Association between post-test level of knowledge of study participants and their socio-demographic variables (N=70)

Sl. No	Socio Demographic Variables	Categories	Post- Test Level of Knowledge		Calculated Chi Square Values	df	P value
			Moderate	Adequate			
1	Age	18-19years	17	10	2.34 (NS)	3	0.50
		20-21years	13	7			
		22 years	13	4			
		23 years	7	1			
2	Religion	Hindu	21	11	2.00 (NS)	3	0.57
		Muslim	15	4			

		Christian	11	7			
		Others	1	0			
3	Type of family	Nuclear	16	7	0.23 (NS)	2	0.89
		Joint	26	13			
		Extended	6	2			
4	Educational status of father	No formal education	15	10	5.83 (NS)	3	0.11
		Primary education	9	8			
		PUC	13	2			
		Degree and above	9	2			
5	Educational status of mother	No formal education	16	11	3.52 (NS)	3	0.31
		Primary education	16	4			
		PUC	10	6			
		Degree and above	6	1			
6	Family monthly income	5000-10000	7	3	7.40 (NS)	3	0.06
		10001-15000	5	8			
		15001-20000	18	7			
		Above 20000	18	4			
7	Place of residence	Urban	10	8	8.46 (S)	2	0.01
		Rural	22	8			
		Semi urban	1	6			
8	Source of information	Mass media	16	3	2.97 (NS)	2	0.22
		Magazine	3	2			
		Health personal	29	17			

(NS)= Not Significant (S) = Significant at 0.05 Level

Table 9 reveals that the calculated Chi-square values with regard to Age, Religion, Type of Family, Educational status of father, Educational status of mother, Place of residence, monthly income of the Family, and Source of information are less than the table values at 0.05 level of significance at specific degrees of freedom, hence stated Null Hypothesis **H_{03}** is accepted and research hypothesis H_3 is rejected with regard to all these demographic variables. The calculated Chi-square value with regard to Place of residence is greater than the table value at 0.05 level of significance at specific degrees of freedom. Hence, stated Research hypothesis **H_3** is accepted and Null hypothesis **H_{03}** is rejected

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Table 10: Association between post-test level of attitude of study participants and their socio-demographic variables (N=70)

Sl. No	Socio Demographic Variables	Categories	Post-test Level of Knowledge		Calculated Chi Square Values	df	P value
			Moderate	Adequate			
1	Age	18-19years	1	26	2.23 (NS)	3	0.52
		20-21years	1	19			
		22 years	2	13			
		23 years	0	8			
2	Religion	Hindu	0	32	3.56 (NS)	3	0.31
		Muslim	1	18			
		Christian	2	16			
		Others	0	1			
3	Type of family	Nuclear	2	21	1.78 (NS)	2	0.41
		Joint	1	38			
		Extended	1	7			
4	Educational status of father	No formal education	4	21	2.07 (NS)	3	0.55
		Primary education	4	13			
		PUC	1	16			
		Degree and above	2	9			
5	Educational status of mother	No formal education	0	27	4.11 (NS)	3	0.24
		Primary education	2	18			
		PUC	2	14			
		Degree and above	0	7			
6	Family monthly income	5000-10000	0	10	9.45 (S)	3	**0.02**
		10001-15000	3	10			
		15001-20000	0	25			
		Above 20000	1	21			
7	Place of residence	Urban	2	16	1.17 (NS)	2	0.55
		Rural	1	28			
		Semi urban	1	18			
8	Source of information regarding consanguineous marriage	Mass media	1	18	0.36 (NS)	2	0.83
		Magazine	0	5			
		Health personnel	3	43			

(NS)= Not Significant (S) = Significant at 0.05 Level

Table 10 reveals that the calculated Chi-square values with regard to Age, Religion, Type of Family, Educational status of father, Educational status of mother, Place of residence, monthly income of the Family, and Source of information are less than the table values at 0.05 level of significance at specific degrees of freedom, hence stated Null Hypothesis **H_{03}** is accepted and research hypothesis H_3 is rejected with regard to all these demographic variables. The calculated Chi-square value with regard to Family monthly income is greater than the table value at 0.05 level of significance at specific degrees of freedom. Hence, stated Research hypothesis **H_3** is accepted and Null hypothesis **H_{03}** is rejected.

4. Discussion

The present study evaluated the effectiveness of a MDII on knowledge and attitude regarding consanguineous marriage and its effects among degree students. The findings demonstrated a statistically significant improvement in both knowledge and attitude following the intervention. During the pre-test, **92.85%** of the participants had inadequate knowledge and **7.15%** had moderate knowledge, whereas in the post-test, **60%** had adequate knowledge and **40%** had moderate knowledge, with none of the participants having inadequate knowledge. The mean knowledge score increased significantly from **41.57%** in the pre-test to **70.26%** in the post-test. The calculated paired **t-value (t_{69} = 39.74)** was greater than the table value (**t = 2.00**, df = 69, **p < 0.05**), indicating that the improvement in knowledge was statistically significant. These findings are consistent with previous studies that reported significant improvements in knowledge following structured educational interventions.

Similarly, participants' attitudes improved substantially after the intervention. Before the MDII, **58.57%** of the participants had an unfavorable attitude and **41.43%** had a moderately favorable attitude. Following the intervention, **94.28%** demonstrated a favorable attitude, **5.72%** had a moderately favorable attitude, and none exhibited an unfavorable attitude. The mean attitude score increased from **44.54%** in the pre-test to **81.28%** in the post-test. The calculated paired **t-value (t_{69} = 69.38)** exceeded the critical table value (**t = 2.00**, df = 69, **p < 0.05**), confirming a statistically significant improvement in attitude after the intervention.

A statistically significant positive correlation was observed between knowledge and attitude scores. The Pearson's correlation coefficient was **r = 0.550** during the pre-test and **r = 0.494** during the post-test, indicating that participants with higher knowledge scores also demonstrated more favorable attitudes toward consanguineous marriage and its health consequences. These findings are comparable with previous studies reporting a positive relationship between knowledge and attitude regarding consanguineous marriage.

Analysis of the association between post-test scores and selected demographic variables revealed that post-test knowledge was significantly associated only with **place of residence (χ^2 = 8.46, df = 2, p < 0.05)**, whereas age (χ^2 = **2.34**), religion (χ^2 = **62.00**), type of family (χ^2 = **0.23**), educational status of father (χ^2 = **5.83**), educational status of mother (χ^2 = **3.52**), family monthly income (χ^2 = **7.40**), and source of information (χ^2 = **2.97**) showed no significant association. Similarly, post-test attitude was significantly associated only with **family monthly income (χ^2 = 9.45, df = 3, p < 0.05)**, while age (χ^2 = **2.23**), religion (χ^2 = **3.56**), type of family (χ^2 = **1.78**), educational status of father (χ^2 = **2.07**), educational status of mother (χ^2 = **4.11**), place of residence (χ^2 = **1.17**), and source of information (χ^2 = **0.36**) were not significantly associated. These findings indicate that the MDII was effective irrespective of most demographic characteristics, supporting its applicability among diverse groups of degree students.

5. Conclusion

The findings of the present study demonstrate that the MDII was effective in improving both the knowledge and attitudes of degree students regarding consanguineous marriage and its effects. Following the intervention, participants showed a statistically significant increase in post-test knowledge and attitude scores compared with their baseline scores, indicating that a multidisciplinary educational approach can successfully enhance awareness and promote informed perspectives on the genetic, reproductive, and public health implications of consanguineous marriage. No significant correlation was observed between knowledge and attitude scores; however, selected demographic variables, including place of residence and family income, showed significant associations with knowledge and attitude, respectively. The study highlights the importance of structured, evidence-based educational interventions in promoting genetic health literacy among young adults. Integrating multidisciplinary health education into higher educational institutions may support informed marital and reproductive decision-making, thereby contributing to the prevention of avoidable hereditary disorders and improving community health outcomes. Further studies involving larger, more diverse populations and long-term follow-up are recommended to evaluate the sustainability of knowledge retention and attitude change and to strengthen the evidence for multidisciplinary educational strategies.

6. Recommendations

Further studies may be conducted with larger samples and in different settings to improve the generalizability of the findings. Future research may also consider using a control group, different instructional methods, and longer follow-up periods to assess the sustained effectiveness of the MDII on knowledge and attitude regarding consanguineous marriage and its effects.

Conflict of Interest
The authors declare no conflicts of interest.

Ethical Approval
Institutional Ethics Committee (**Approval No.- IEC/HIMS/RR450/26-05-2023, approved on 26-025-2023**) and administrative permission was taken from Government Women's Degree College authorities. Informed Consent was obtained from all individual participants included in this study.

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