
Selection of a spouse for females using hybrid multi-criteria decision-making model in India

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Abstract: Unlike western world, Indians have different way to choose their partner, especially for females. In the past, there were few opportunities available to females for the selection of their partner due to limited access to geographical area and information. With the enhanced communication mediums such as matrimonial websites females, especially corporate working, receive many profiles of the potential candidates for marriage. Hence, to assist the females in their decision making for selecting an appropriate life-partner this work has been conducted. The hybrid method of analytic hierarchy process (AHP) and technique for order preference and similarity to ideal solution (TOPSIS) has been applied to calculate the importance of each criterion which is identified through literature review and field survey and rank the various alternatives (candidate profiles), respectively. The results of a real case study show that the application of AHP and TOPSIS leads to better decision making for a female in the multi-criteria decision making scenario such as this.

Keywords: society; AHP; analytic hierarchy process; TOPSIS; technique for order preference and similarity to ideal solution; marriage; matrimonial websites; decision making.

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1 Introduction

India is the second most populous country in the world where thousands of males and females tie the knots with their partners for marriage every year. In the past, the selection of the life partner of a male and female was done by the family members and named as parental arranged marriages in the literature (Jejeebhoy et al., 2013). However, in the present time, the selection of a life partner is done by the candidate itself or candidate and its family. Hence, the marriages organised in such a way has been defined as love marriages (self-arranged) or transitional marriages, respectively (Tsutsui, 2013). Huang et al. (2012) defined that the formation of a marriage is dependent on the matching process which may happen randomly or with the help of a commercial agent.

There are various studies conducted which show the application of different techniques or models to calibrate the role of parents and other family members in the process of selection of a life partner (Becker, 1973). Along with this, the analysis such as cost/benefit analysis and perceived gains of the marriage i.e. the utility of getting married has more value than remaining single or not (Manfredini et al., 2013). Uecker (2012) elaborates on numerous benefits of getting married one of which is to convene the benefits of psychological health.

The marriages in Indian society play an important role because for years it has been seen as a lifelong relationship (Joshi and Kumar, 2012). The marriages are not just a wedding of two persons but it also connects the families of the two and strengthens their roots in the community, particularly caste. Due to the prevalence of caste system in Indian society, there are limited opportunities available for selecting a life-partner (Ahuja and Ostermann, 2016). And most of these marriages, within a particular caste, are organised with the help of a mediator (referee). However, due to the limited sample size, in a particular caste, has amplified the severity of selection of an appropriate candidate for marriage. To widen this sample size and perfect match making, a number of solutions have come up in the market. These solutions include newspaper, matrimonial websites, and social networking sites, etc. (Joshi and Kumar, 2012; Titzmann, 2013). These websites usually provide a long list of candidates to be selected as a perfect match. Choosing from a long list becomes a tedious task for them which finally lead to confusion and wastage of time. Therefore, to save the time and to identify the best match the present work has been carried out. This study would help the females for making a clear decision about selecting a perfect male. In this study, we have identified the criteria for selecting the best candidate characteristics from literature and field survey, then an integrated multi-criteria decision-making model has been proposed to select the perfect male partner. The rest of this study has been organised as follows: Section 2 details the review of literature. The methods used in the study have been given in Section 3. A real case study has been detailed in Section 4 for the application of the proposed model. Section 5 gives the results and discussions of the study. Finally, Implications and conclusion have been given in Sections 6 and 7, respectively.

2 Literature review

Buss and Barnes (1986) studied that the males and females have specific preferences such as height, intelligence, or extraversion for their mate selection; they just not like all individuals of opposite sex for getting married. Hooghiemstra (2001) points out in a study

that numerous theories available in the literature show the decision of a partner selection for marriage depends upon the societal norms and geographical location. Furthermore, premarital non-family experiences, media exposure, and participation in youth clubs impact positively for self-selection of spouse (Ghimire et al., 2006). Mastekaasa (1992) noticed in a study that the spouse selection process for women has various limitations and there was no specific mechanism to define it.

Boulier and Rosenzweig (1984) revealed in their study that the woman with more attraction tends to receive a higher education which leads to a comparatively higher age for marriage. Additionally, the woman with higher education shows a reluctant behaviour for the selection of a lower qualified male (Skopek et al., 2011). Since most of the educated women are exposed to the internet along with various other means of partner selection, so they can easily utilise this model for the preliminary assessment of the candidate profiles (Skopek et al., 2011; Titzmann, 2013). Because the selection of the partner for marriage is supposed to be the most important decision making in India, therefore, the application of this decision-making model can provide the best candidate among the given profiles (Joshi and Kumar, 2012).

Table 1 The description of criteria identified for study

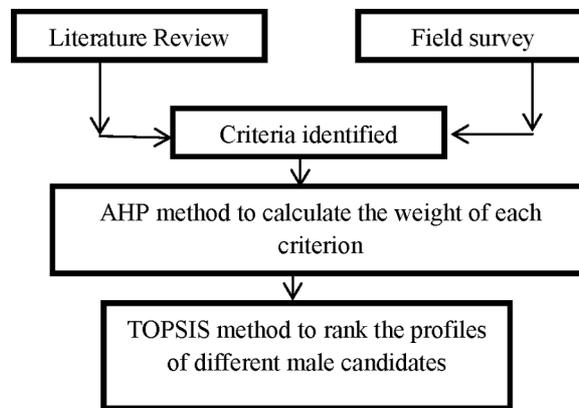
| | <i>Criteria name</i> | <i>Reference</i> |
|------------|-----------------------------|---|
| C1 | Profession | Boulier and Rosenzweig (1984), Buss and Barnes (1986), Callan (1983), Joshi and Kumar (2012) |
| C2 | Personality | Buss and Barnes (1986), McClintock (2014), Regan and Berscheid (1997), Townsend and Levy (1990) |
| C3 | Age | Dribe and Lundh (2009) |
| C4 | Economic status of a family | Boulier and Rosenzweig (1984), Callan (1983), Dribe and Lundh (2009), McClintock (2014), Regan and Berscheid (1997), Townsend and Levy (1990) |
| C5 | Hair style | Field survey |
| C6 | Educational qualification | Blossfeld (2009), Boulier and Rosenzweig (1984), Callan (1983), Hooghiemstra (2001), Regan and Berscheid (1997), Skopek et al. (2011) |
| C7 | Family background | Field survey |
| C8 | Dowry demand | Field survey and Arunachalam and Logan (2016) |
| C9 | Caste | Field survey |
| C10 | Culture and region | Hooghiemstra (2001) |

As discussed above, this is a matter of life so final decision making must be done on the basis of a formal meeting with probable candidates (Bruno, 2005). Therefore, this study has been carried out to address this vital issue of suitable partner selection for females. There are 10 important criteria, revealed from the literature and field survey, which play an important role in the decision making of educated females for the selection of their life partners in India. These criteria have been described in detail in Table 1.

3 Research methodology

The analytic hierarchy process (AHP) and technique for order preference and similarity to ideal solution (TOPSIS) methods have been applied to address this problem. With the help of AHP method, the weights of the criteria would be computed. The TOPSIS method assists in ranking the profile of various male candidates which are considered for the selection of an appropriate and best suitable male candidate. Gumus (2009) and Chauhan and Singh (2016) described in their study that the application of a hybrid model using AHP and TOPSIS methods make the decision-making process effective and convenient for decision makers. Therefore, for adequate analysis and better results, the hybrid model using AHP and TOPSIS has been proposed in the study. Figure 1 shows the flow of the present study.

Figure 1 Flow of the study



3.1 Analytic hierarchy process (AHP)

AHP is a multiple criteria decision-making tool (Saaty, 1980). It has become a widely popular MCDM procedure in addressing the numerous problems such as waste management, supply chain management (Astuti and Meuwissen, 2013; Gumus, 2009). Application of AHP to a decision problem involves four steps (Zahedi, 1986).

Step 1: Structuring of the decision problem.

It includes disintegration of the decision problem into elements according to their common characteristics and the formation of a hierarchical model having different levels. A simple AHP model has three levels such as goal, criteria and alternatives. More complex models with more levels could be formulated according to the problem.

Step 2: Making pair-wise comparisons and obtaining the judgemental matrix.

In this step, a set of pair-wise comparison matrices (size $n \times n$) is constructed for each of the lower levels with one matrix for each element in the level immediately above by using a rating scale (1–9 scale in traditional AHP). The pair-wise comparisons are done in terms of which one element dominates the other. If n elements are assumed $n(n - 1)/2$ elements of the pairwise comparison must be derived. Let $C_1, C_2, C_3, \dots, C_n$ denote the set

of elements, while a_{ij} represents a judgement on a pair of elements C_i, C_j . An $n \times n$ matrix can be constructed as follows:

$$A = [a_{ij}] \begin{matrix} & C_1 & C_2 & \dots & C_n \\ C_1 & \begin{bmatrix} 1 & a_{12} & a_{13} & \dots & a_{1n} \\ \vdots & 1 & \vdots & \ddots & \vdots \\ \vdots & \vdots & \dots & \ddots & \vdots \\ C_n & a_{n1} & a_{n2} & a_{n3} & \dots & 1 \end{bmatrix} \end{matrix} \quad (1)$$

Each entry a_{ij} of the judgemental matrix A is governed by the three principles: $a_{ij} > 0$; $a_{ij} = 1/a_{ji}$; and $a_{ii} = 1$ for all i . If the transitivity property holds, i.e., the $a_{ij} = a_{ik} * a_{kj}$, for all the entries of the matrix, then the matrix is said to be consistent. The quantification of a_{ij} can be done in terms of weights W_1, W_2, \dots, W_n , where $a_{ij} = W_i/W_j$; for $(i, j = 1, 2, 3, \dots, n)$ and matrix A can be written as:

$$A = \begin{matrix} & C_1 & C_2 & \dots & C_n \\ C_1 & \begin{bmatrix} w_1 / w_1 & w_1 / w_2 & \dots & w_1 / w_n \\ C_2 & w_2 / w_1 & w_2 / w_2 & \dots & w_2 / w_n \\ \vdots & \vdots & \dots & \ddots & \vdots \\ C_n & w_n / w_1 & w_n / w_2 & \dots & w_n / w_n \end{bmatrix} \end{matrix} \quad (2)$$

Step 3: Computing eigenvalue, eigenvectors and testing consistency

The weight vector (q) of elements is multiplied with matrix A resulting in nq , i.e., $(A - nI)q = 0$, where q is the eigenvalue (n) of eigenvector. Saaty (1990) suggested that the largest eigenvalue λ_{max} can be stated as:

$$\lambda_{max} = \sum_{j=1}^n a_{ij} * \left(\frac{W_j}{W_i} \right) \quad (3)$$

because a_{ij} represents the subjective responses of decision makers due to which the actual value of (W_i/W_j) may have a certain difference.

Therefore, if A is a consistency matrix, eigen vector Q can be computed as follows:

$$(A - \lambda_{max} I)Q = 0 \quad (4)$$

Performing the test of consistency:

Saaty (1990) proposed consistency index (CI) and consistency ratio (CR) to verify the consistency of the comparison matrix. CI and CR are defined as follows:

$$CI = (\lambda_{max} - n) / (n - 1) \quad (5)$$

$$CR = CI / ACI \quad (6)$$

where ACI represents the average consistency index of randomly generated weights (Saaty, 1980). As a rule of thumb, a CR value of 0.10 or less ($CR \leq 0.10$) is acceptable. Otherwise, it is recommended that matrix A should be observed to resolve inconsistencies in pairwise comparisons.

Step 4: Aggregation of weights.

3.2 Technique for order preference and similarity to ideal solution (TOPSIS)

TOPSIS method has been presented by Chen and Hwang (1992), with reference to Hwang and Yoon (1981). From then, it has been applied to various problems such as energy management and human resource management, etc. (Behzadian et al., 2012). The TOPSIS method is one of the most popular techniques for ranking various alternatives i.e., life partner profiles in this case (Behzadian et al., 2012). The steps of this method have been detailed in the following steps:

Step 1: Compute the normalised decision matrix. The normalised value p_{ij} is calculated as

$$P_{ij} = \frac{k_{ij}}{\sum_{i=1}^m k_{ij}^2} \quad i = 1, 2, 3, \dots, m; j = 1, 2, \dots, n \quad (7)$$

Step 2: Compute the weighted normalised decision matrix. The weighted normalised value v_{ij} is calculated as

$$v_{ij} = w_j x p_{ij}, \quad i = 1, 2, 3, \dots, m; j = 1, 2, \dots, n \quad (8)$$

where w_j is the weight of the j th attribute or criterion, and $\sum_{j=1}^n w_j = 1$.

Step 3: The positive ideal (A^+) and negative ideal (A^-) solution are determined in this step. The solutions, A^+ and A^- , are determined in terms of weighted normalised values.

$$A^+ = \{v_1^+, v_2^+, \dots, v_n^+\} = \left\{ \left(\max_j v_{ij} \mid i \in B \right), \left(\max_j v_{ij} \mid i \in C \right) \right\}, \quad (9)$$

$$A^- = \{v_1^-, v_2^-, \dots, v_n^-\} = \left\{ \left(\min_j v_{ij} \mid i \in B \right), \left(\min_j v_{ij} \mid i \in C \right) \right\}, \quad (10)$$

where B is associated with benefit criteria, and C is associated with cost criteria.

Step 4: Compute the separation measures, using the n -dimensional Euclidean distance. The separation of each alternative from the positive ideal solution is given as

$$d_i^+ = \sqrt[2]{\left\{ \sum_{j=1}^n (v_{ij} - v_j^+)^2 \right\}} \quad i = 1, 2, 3, \dots, m \quad (11)$$

Similarly, the separation from the negative ideal solution is computed by equation (12)

$$d_i^- = \sqrt[2]{\left\{ \sum_{j=1}^n (v_{ij} - v_j^-)^2 \right\}} \quad i = 1, 2, 3, \dots, m \quad (12)$$

Step 5: Compute the relative closeness (RC) to the ideal solution. The relative closeness of the alternative A_i with respect to A^+ is defined as

$$RC = \frac{d_i^-}{d_i^+ + d_i^-} \quad (13)$$

Step 6: Rank the preference order. For ranking alternatives using this index, we can rank alternatives in decreasing order.

4 Case study

The integrated approach proposed for the selection of spouse for females has been applied to a real-world situation. Firstly, the criteria have been identified from the literature and field survey for the selection of important criteria. Secondly, the girls (above 25 years of age) who have registered themselves at various matrimonial websites and other online places have been interviewed personally. Thirdly, the spouse selection, on the basis of candidate profiles, has been done for a female among those who were interviewed earlier.

4.1 Application of AHP

Tables 2–4 has been given to show the pairwise comparison matrix, the normalised matrix of all respondents' responses, and weights obtained for each criterion, respectively.

Table 2 The pairwise comparison matrix of a respondent

| | <i>C1</i> | <i>C2</i> | <i>C3</i> | <i>C4</i> | <i>C5</i> | <i>C6</i> | <i>C7</i> | <i>C8</i> | <i>C9</i> | <i>C10</i> |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| <i>C1</i> | 1 | 1 | 1/7 | 5 | 1 | 1/5 | 1/7 | 1 | 1/9 | 1/9 |
| <i>C2</i> | 1 | 1 | 1/5 | 5 | 1 | 1/5 | 5 | 1/3 | 1/9 | 1/9 |
| <i>C3</i> | 7 | 5 | 1 | 9 | 1/5 | 5 | 5 | 5 | 1/9 | 1/9 |
| <i>C4</i> | 1/5 | 1/5 | 1/9 | 1 | 1/3 | 1/7 | 1/5 | 1/5 | 1/9 | 1/9 |
| <i>C5</i> | 1 | 1 | 5 | 3 | 1 | 5 | 5 | 1/5 | 1/9 | 1/9 |
| <i>C6</i> | 5 | 5 | 1/5 | 7 | 1/5 | 1 | 5 | 5 | 1/9 | 1/9 |
| <i>C7</i> | 7 | 1/5 | 1/5 | 5 | 1/5 | 1/5 | 1 | 1/7 | 1/9 | 1/9 |
| <i>C8</i> | 1 | 3 | 1/5 | 5 | 5 | 1/5 | 7 | 1 | 1/9 | 1/9 |
| <i>C9</i> | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 1 | 1/9 |
| <i>C10</i> | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 1 |

4.2 Application of TOPSIS

Tables 5–9 have been obtained with the help of TOPSIS method. Table 5 shows the responses of a female for alternatives (profile of males) on the basis of each criterion, which has been given using matrimonial website. Table 6 shows the weighted normalised matrix using the weights obtained from AHP method (Table 4). Tables 7 and 8 give the details about the distance from positive ideal solution (PIS) and negative ideal solution (NIS). Table 9 provides the ranking of male candidates for this particular female.

Table 3 The normalised matrix of all respondents' responses

| | <i>C1</i> | <i>C2</i> | <i>C3</i> | <i>C4</i> | <i>C5</i> | <i>C6</i> | <i>C7</i> | <i>C8</i> | <i>C9</i> | <i>C10</i> |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| C1 | 0.107 | 0.184 | 0.079 | 0.178 | 0.107 | 0.098 | 0.088 | 0.153 | 0.105 | 0.084 |
| C2 | 0.043 | 0.075 | 0.061 | 0.134 | 0.142 | 0.058 | 0.116 | 0.043 | 0.088 | 0.099 |
| C3 | 0.142 | 0.128 | 0.105 | 0.113 | 0.030 | 0.117 | 0.168 | 0.126 | 0.088 | 0.099 |
| C4 | 0.019 | 0.018 | 0.030 | 0.032 | 0.061 | 0.021 | 0.019 | 0.043 | 0.050 | 0.082 |
| C5 | 0.036 | 0.019 | 0.124 | 0.019 | 0.036 | 0.055 | 0.068 | 0.036 | 0.036 | 0.021 |
| C6 | 0.127 | 0.152 | 0.105 | 0.178 | 0.077 | 0.117 | 0.116 | 0.106 | 0.151 | 0.069 |
| C7 | 0.083 | 0.044 | 0.043 | 0.113 | 0.036 | 0.068 | 0.068 | 0.032 | 0.088 | 0.118 |
| C8 | 0.036 | 0.089 | 0.043 | 0.038 | 0.050 | 0.056 | 0.107 | 0.051 | 0.038 | 0.061 |
| C9 | 0.223 | 0.184 | 0.259 | 0.138 | 0.217 | 0.168 | 0.168 | 0.292 | 0.218 | 0.225 |
| C10 | 0.183 | 0.108 | 0.151 | 0.056 | 0.243 | 0.243 | 0.083 | 0.118 | 0.138 | 0.143 |

Table 4 The criteria weights

| <i>Criteria</i> | <i>Weight</i> |
|-----------------|---------------|
| C1 | 0.118 |
| C2 | 0.086 |
| C3 | 0.112 |
| C4 | 0.037 |
| C5 | 0.045 |
| C6 | 0.120 |
| C7 | 0.069 |
| C8 | 0.057 |
| C9 | 0.209 |
| C10 | 0.147 |

Table 5 The respondents' responses for alternatives

| | <i>C1</i> | <i>C2</i> | <i>C3</i> | <i>C4</i> | <i>C5</i> | <i>C6</i> | <i>C7</i> | <i>C8</i> | <i>C9</i> | <i>C10</i> |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| A1 | 3 | 1 | 4 | 5 | 4 | 3 | 2 | 5 | 5 | 1 |
| A2 | 2 | 5 | 3 | 5 | 5 | 2 | 2 | 3 | 5 | 4 |
| A3 | 4 | 3 | 5 | 3 | 3 | 5 | 2 | 2 | 5 | 5 |
| A4 | 1 | 2 | 2 | 1 | 3 | 5 | 3 | 5 | 3 | 3 |
| A5 | 5 | 4 | 1 | 1 | 2 | 1 | 5 | 4 | 2 | 2 |
| A6 | 2 | 4 | 1 | 1 | 5 | 1 | 4 | 4 | 1 | 5 |
| A7 | 3 | 5 | 3 | 2 | 3 | 2 | 4 | 2 | 4 | 4 |
| A8 | 4 | 3 | 4 | 5 | 1 | 3 | 2 | 3 | 4 | 1 |
| A9 | 4 | 1 | 2 | 3 | 2 | 3 | 5 | 3 | 5 | 3 |
| A10 | 5 | 2 | 2 | 3 | 2 | 2 | 1 | 4 | 2 | 3 |

Table 6 Weighted normalised matrix

| | <i>C1</i> | <i>C2</i> | <i>C3</i> | <i>C4</i> | <i>C5</i> | <i>C6</i> | <i>C7</i> | <i>C8</i> | <i>C9</i> | <i>C10</i> |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| A1 | 0.03 | 0.09 | 0.11 | 0.04 | 0.04 | 0.12 | 0.07 | 0.06 | 0.09 | 0.01 |
| A2 | 0.02 | 0.43 | 0.08 | 0.04 | 0.06 | 0.08 | 0.07 | 0.03 | 0.09 | 0.05 |
| A3 | 0.04 | 0.26 | 0.14 | 0.02 | 0.03 | 0.20 | 0.07 | 0.02 | 0.09 | 0.07 |
| A4 | 0.01 | 0.17 | 0.06 | 0.01 | 0.03 | 0.20 | 0.10 | 0.06 | 0.05 | 0.04 |
| A5 | 0.05 | 0.34 | 0.03 | 0.01 | 0.02 | 0.04 | 0.17 | 0.05 | 0.03 | 0.03 |
| A6 | 0.02 | 0.34 | 0.03 | 0.01 | 0.06 | 0.04 | 0.14 | 0.05 | 0.02 | 0.07 |
| A7 | 0.03 | 0.43 | 0.08 | 0.01 | 0.03 | 0.08 | 0.14 | 0.02 | 0.07 | 0.05 |
| A8 | 0.04 | 0.26 | 0.11 | 0.04 | 0.01 | 0.12 | 0.07 | 0.03 | 0.07 | 0.01 |
| A9 | 0.04 | 0.09 | 0.06 | 0.02 | 0.02 | 0.12 | 0.17 | 0.03 | 0.09 | 0.04 |
| A10 | 0.05 | 0.17 | 0.06 | 0.02 | 0.02 | 0.08 | 0.03 | 0.05 | 0.03 | 0.04 |

Table 7 Distance from positive ideal solution (PIS)

| | <i>C1</i> | <i>C2</i> | <i>C3</i> | <i>C4</i> | <i>C5</i> | <i>C6</i> | <i>C7</i> | <i>C8</i> | <i>C9</i> | <i>C10</i> | <i>d</i> ⁺ |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|-----------------------|
| A1 | 0.021 | 0.344 | 0.084 | 0.000 | 0.011 | 0.080 | 0.104 | 0.034 | 0.000 | 0.055 | 0.733 |
| A2 | 0.032 | 0.000 | 0.056 | 0.000 | 0.000 | 0.120 | 0.104 | 0.011 | 0.000 | 0.014 | 0.336 |
| A3 | 0.011 | 0.172 | 0.112 | 0.015 | 0.022 | 0.000 | 0.104 | 0.000 | 0.000 | 0.000 | 0.436 |
| A4 | 0.042 | 0.258 | 0.028 | 0.030 | 0.022 | 0.000 | 0.069 | 0.034 | 0.034 | 0.027 | 0.546 |
| A5 | 0.000 | 0.086 | 0.000 | 0.030 | 0.034 | 0.160 | 0.000 | 0.023 | 0.051 | 0.041 | 0.424 |
| A6 | 0.032 | 0.086 | 0.000 | 0.030 | 0.000 | 0.160 | 0.035 | 0.023 | 0.068 | 0.000 | 0.433 |
| A7 | 0.021 | 0.000 | 0.056 | 0.022 | 0.022 | 0.120 | 0.035 | 0.000 | 0.017 | 0.014 | 0.307 |
| A8 | 0.011 | 0.172 | 0.084 | 0.000 | 0.045 | 0.080 | 0.104 | 0.011 | 0.017 | 0.055 | 0.578 |
| A9 | 0.011 | 0.344 | 0.028 | 0.015 | 0.034 | 0.080 | 0.000 | 0.011 | 0.000 | 0.027 | 0.550 |
| A10 | 0.000 | 0.258 | 0.028 | 0.015 | 0.034 | 0.120 | 0.139 | 0.023 | 0.051 | 0.027 | 0.694 |

Table 8 Distance from negative ideal solution (NIS)

| | <i>C1</i> | <i>C2</i> | <i>C3</i> | <i>C4</i> | <i>C5</i> | <i>C6</i> | <i>C7</i> | <i>C8</i> | <i>C9</i> | <i>C10</i> | <i>d</i> ⁻ |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|-----------------------|
| A1 | 0.021 | 0.000 | 0.000 | 0.030 | 0.022 | 0.080 | 0.035 | 0.000 | 0.068 | 0.000 | 0.256 |
| A2 | 0.011 | 0.344 | 0.028 | 0.030 | 0.034 | 0.040 | 0.035 | 0.023 | 0.068 | 0.041 | 0.653 |
| A3 | 0.032 | 0.172 | 0.028 | 0.015 | 0.011 | 0.160 | 0.035 | 0.034 | 0.068 | 0.055 | 0.609 |
| A4 | 0.000 | 0.086 | 0.056 | 0.000 | 0.011 | 0.160 | 0.069 | 0.000 | 0.034 | 0.027 | 0.443 |
| A5 | 0.042 | 0.258 | 0.084 | 0.000 | 0.000 | 0.000 | 0.139 | 0.011 | 0.017 | 0.014 | 0.565 |
| A6 | 0.011 | 0.258 | 0.084 | 0.000 | 0.034 | 0.000 | 0.104 | 0.011 | 0.000 | 0.055 | 0.556 |
| A7 | 0.021 | 0.344 | 0.028 | 0.007 | 0.011 | 0.040 | 0.104 | 0.034 | 0.051 | 0.041 | 0.682 |
| A8 | 0.032 | 0.172 | 0.000 | 0.030 | 0.011 | 0.080 | 0.035 | 0.023 | 0.051 | 0.000 | 0.433 |
| A9 | 0.032 | 0.000 | 0.056 | 0.015 | 0.000 | 0.080 | 0.139 | 0.023 | 0.068 | 0.027 | 0.439 |
| A10 | 0.042 | 0.086 | 0.056 | 0.015 | 0.000 | 0.040 | 0.000 | 0.011 | 0.017 | 0.027 | 0.295 |

Table 9 Ranking of alternatives

| | d^+ | d^- | $RC = d^+ / (d^+ + d^-)$ | Rank |
|-----|-------|-------|--------------------------|------|
| A1 | 0.733 | 0.256 | 0.259 | 10 |
| A2 | 0.336 | 0.653 | 0.660 | 2 |
| A3 | 0.436 | 0.609 | 0.583 | 3 |
| A4 | 0.546 | 0.443 | 0.448 | 6 |
| A5 | 0.424 | 0.565 | 0.571 | 4 |
| A6 | 0.433 | 0.556 | 0.562 | 5 |
| A7 | 0.307 | 0.682 | 0.690 | 1 |
| A8 | 0.578 | 0.433 | 0.428 | 8 |
| A9 | 0.550 | 0.439 | 0.444 | 7 |
| A10 | 0.694 | 0.295 | 0.298 | 9 |

5 Results and discussions

The weights obtained for each criterion using AHP show the significance of a particular criterion in the decision making of females in India. The caste has been noticed as the most significant factor for the females considered in this study which may have numerous interpretations such as the prevalence of caste system in Indian. However, the females describe that it becomes easier to convince parents if they choose a male candidate from the same caste. The region of a candidate is another significant criterion which is considered by females for the selection of their better half. This shows that the cultural or language differences play a vital role in the male selection process of females. Profession, educational qualification, and age of a male candidate can be noticed as the other important criteria for being selected to be a potential candidate. Moreover, it can also be suggested to the female partner looking male candidates that the females today need males who are more compatible with them in terms of profession, education, and age (maturity). The other significant criterion is the personality of a male candidate which can be enhanced with the help of gymming, gym, improved dressing sense of an individual, and a better photo shoot for the profile picture uploaded on a matrimonial website. Apart from this, the criteria, namely, family background, economic status, and hair-style of a male have been considered relatively less important for the selection of a male. The dowry demanding males have been outrightly rejected by several females which may be attributed to the changing minds of professional and self-dependent women of the present era. Therefore, it is suggested to the male candidates that the dowry is a menace and they are supposed to refrain from it for earning a better half. Moreover, on the basis of the criteria weights and the responses received from a female for 10 male profiles. The male profiles have been ranked and filtered to choose the probable candidates to fix the face to face meetings. There are cases when a female receives more than 50 profiles of male candidates and due to the paucity of time, they cannot meet each one of them. Therefore, the ranking the profiles may filter few best profiles to save precious time of the professional females.

6 Implications and limitations of the study

6.1 Managerial Implications

The present study deals with an issue of critical importance which is of vital importance from the perspective of management and academia. The managerial implications include the enhancement of decision-making process for females within limited resources such as time and money. On the basis of the results obtained in the study, the matrimonial websites may assist the males to improve their candidature by working upon the criteria such as educational qualification, profession, and personality. Doing so would help the females to have better options for marrying which would lead to the enhanced satisfaction and word of mouth publicity of matrimonial websites by their customers.

6.2 Academic Implications

The academic implications of this research can be derived in terms of its contribution towards the body of knowledge for studying the selection of a better male candidate. Additionally, it can also be derived that the problems related to behavioural sciences can be addressed with the help of the application of multi-criteria decision-making methods such as AHP and TOPSIS. Moreover, it would pave the way to researchers for future works in multi-disciplinary areas.

6.3 Limitations and future research directions

The limitations of the study include the paucity of time and individual bias in responding and recording the responses. Additionally, the inclusion of theories related to the individual and strategic decision can also be explored and utilised for enhancing this decision-making process; however, it remained the limitation of study which can be addressed by researchers in future. In future, the researchers can conduct studies for other inter-disciplinary areas using the MCDM methods and theories.

7 Conclusion

With the changing times the females of the present era have been more self-reliance; hence, their criteria for choosing a better have also been changed. Therefore, to consider the wider spectrum of a female's choice the study has been carried out by knowing the criteria important for their bridegroom selection in India. The results of the study show that the professional females of India need more intellectually and professionally compatible males rather than the ancestral property of his family. The highlighted importance of educational qualification to be a better male candidate is a positive sign for the Indian society because it would lead to a more educated society in future. However, the casteism is still prevalent in the country which is somehow impacting the independence of individuals in their decision making regarding marriage. Finally, it may be concluded that the present study would not only assist the professional females in the selection of their better half but also it would make the changes in society.

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