IDENTIFICATION OF KOREAN WAVE INFLUENCED AGE GROUP BY USING MCDM METHOD

Abstract

The primary objective of this paper is to determine which age group of people is most affected by the Korean wave. Using the TOPSIS method for the multi-criteria decision-making (MCDM) approach, this study examined the age group influenced by the Korean wave. Furthermore, cross tabulation is utilized to analyze the people's preferences and forecast the impact of the Korean wave in South India.

Keywords: MCDM, Korean wave, TOPSIS, tabulation.

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I. INTRODUCTION

The Korean Wave, also known as Hallyu, is an expression of South Korea's pop culture exports, which include shows, music, films, and TV dramas. Hallyu, which began to gain popularity in the 1990s, has since expanded to every country in the world. Hallyu 2.0 appeared about 2007 and Hallyu 3.0 started in the middle of the 2010s and is still going strong today [1]. The effect of the Korean wave was initially felt in China and Japan,[2] then spread to other countries in the world and Southeast Asia. An important development in 2012 was the acceptance of K-pop by the international music community, which helped the Korean Wave gain prominence [3,4]. The Korean Wave, which initially took off in Asia, is currently extremely popular on a global scale. Global audiences are enthralled by K-dramas and lured to the infectious beats of K-pop music. Social networking sites and online video-sharing services have been essential in enabling the Korean entertainment sector to connect with a sizable global audience [5,6]. Urban young are particularly fond of K-pop, K-movies, and K-dramas, and their popularity is steadily rising. In India, there has been a recent major increase in interest in Korean culture. In the nation, people are fans of Korean dramas, Korean food, and Korean beauty products. The enormous popularity of Korean dramas and K-pop music has directly contributed to the rapid spread of the Korean language in India. Notably [7,8], Psy's smash track "Gangnam Style" made history on the music charts and propelled him to prominence all over the world. In acknowledgement of K-pop's influence around the world, the Oxford English Dictionary has incorporated "Korean pop music" as a definition. Korean dramas are now widely available, frequently with subtitles in other languages, thanks to the growth of streaming platforms [9]. As a result, numerous K-dramas have significantly increased in popularity in particular nations, highlighting Korean culture, style, and fashion [5]. In a different vein, cross-tabulation, also known as contingency table analysis, is a powerful analytical method for analysing categorical data. It entails building a two-dimensional table to count the responders who met certain criteria listed in the table's cells. Researchers and analysts can benefit from the insightful information provided by this type of study, which has its own unique language.

A mathematical framework known as fuzzy logic was developed to address the difficulties presented by ambiguity and imprecision in reasoning and decision-making[10,11,12]. Fuzzy logic provides the idea of degrees of truth in contrast to classical logic, which functions in binary terms of true or false, understanding that real-world concepts and variables frequently have membership or truth values that fall along a spectrum [13,14]. This framework acknowledges that in many real-world situations, concept borders are not fixed but rather exist on a continuum, allowing for more flexible and nuanced thinking. The TOPSIS (Technique for Order of Preference by Similarity to Ideal Solution) technique was developed in 1981 by Jyrki Hwang and Ki-Joon Yoon and aims to choose the best option from a set of alternatives based on several criteria [15,16]. The TOPSIS technique, which solves problems with decision-making incorporating conflicting criteria, was published in their work titled "Multiple Attribute Decision Making: Methods and Applications". In this method, options are assessed according to how well they perform according to a set of criteria using a geometric approach [17]. The method assumes that the ideal solution is one that is as far from the negative ideal solution and as close to the positive ideal solution as is reasonably achievable. Since its creation, TOPSIS has grown significantly in popularity and has been widely used in a variety of industries, including engineering, management, environmental research, and finance [18,19]. It gives decision-makers a structured framework to evaluate

and rank options in accordance with their preferences and goals, facilitating efficient decision-making. The process of choosing or ranking options when several criteria (or objectives) must be taken into account simultaneously is known as multi-criteria decision analysis, or MCDA. One of the approaches used by the MCDM is the TOPSIS approach.

II. LITERATURE REVIEW

This approach enables the assignment of ranks based on the relative importance and weights of various elements. It draws insights from multiple research studies exploring the influence of the Korean wave in different regions. [20] Marchang Reimeingam (2014) conducted a study on the interaction of people in Manipur with Korean culture through the media, focusing on the Korean Wave. [21] Nguyen Hoang Anh and Nguyen Thi Nguyet Ha (2019) investigated customers' satisfaction with Korean dramas in Vietnam. Their research found that elements such as scripts, music, and cultural imagery significantly influenced Vietnamese viewers' satisfaction with these dramas. [22] Shibata (2014) explored the globalization of popular culture, specifically the Korean wave's impact in Japan. The study delved into various cultural factors contributing to the success of Korean TV dramas in Japan, including interviews with fans of Winter Sonata and Fuyu Sona, the two dramas that sparked the Korean Wave in Japan. [23] Shim (2008) examined the growth of Korean cultural industries and the Korean wave in the new millennium, along with the support provided by governments and corporations for this cultural movement. The paper highlights the significance of a benchmark decision situation when evaluating the effectiveness of multi-criteria decision-making methods. It delves into current decision-making theories and offers three crucial directions for enhancing the descriptive aspects of multi-criteria decision analysis [24]. The paper showcases five Hybrid Multi Criteria Decision Making (HMCDM) methods for identifying the optimal polymer-based biomaterial in dentistry. The comparative analysis indicates that AHP-VIKOR, AHP-TOPSIS, and AHP-PROMETHEE exhibit stronger correlations than AHP-MOORA and AHP-ELECTRE [25]. By drawing from these diverse research studies, this method incorporates a comprehensive understanding of the Korean wave's influence across different regions and cultural contexts.

The Korean wave exerts a significant influence on people from various countries, including India. This paper aims to analyse the impact of the Korean wave on Indian individuals across different aspects. The primary goal is to assess the age group that exhibits the highest interest in watching Korean content and is most attracted to Korean culture. Additionally, the paper investigates the main platform used for learning about Korean culture, with a focus on K-dramas, particularly in the romance genre. The analysis also delves into the reasons behind people's admiration for K-POP groups. Furthermore, the paper explores the cultural similarities between South Korean and South Indian cultures. Finally, using the TOPSIS method, the research aims to identify the age group most influenced by the Korean wave.

The followings are the main objectives of the paper:

1. The objective is to assess the influence of the Korean wave on South Indians.
2. To conduct exploratory data analysis to identify sources of influence, time preferences, cultural similarities, popularity of the Korean wave in South India, and its impact on South Indians.

3. To perform cross-tabulation for analyzing respondents based on category and gender, exploring the habits they adopted from watching Korean content and their views on influence.
4. To determine the most influenced age group by evaluating their level of attraction to South Korea and survey responses using a multi-criteria decision-making method.

This research article covers in the sections: Section 3 focuses on data interpretation employing five distinct phases, Section 4 discusses crosstabulation and its analysis, and Section 5 explains data analysis using the MCDM method.

III. DATA INTERPRETATION

This article dives into the impact of the Korean wave on various age groups in the South Indian populace. The main goal is to determine which age demographics are most impacted by the Korean wave phenomena. To do this, extensive data has been gathered and examined with a focus on South Indians who have been influenced by the Korean wave. The study also attempts to measure the depth of their interaction with Korean content, including the amount of time spent consuming it, and to analyse the region's general popularity of Korean culture. The investigation is expanded to examine the relationship between incorporating Korean content into daily life and various demographic groups. Furthermore, the study looks into the impact of gender on persons in South India who have been influenced by the Korean wave. The article provides transparency and clarity on the data collection procedure by outlining the particular questions that were asked of the participants throughout the study's various phases. Following this comprehensive approach, the research intends to considerably add to the knowledge of the Korean wave's influence on South Indian audiences, highlighting the elements that drive its popularity among various groups.

1. **Phase 1- Analyzing Responses on Korean Culture Sources:** A thorough investigation of the factors influencing the Korean wave's widespread appeal was done as part of this research project. To do this, participants were asked an important question: "Where do you learn about Korean culture?". Their replies give us important information about the various ways that Korean culture is communicated. In particular, 70 respondents said that watching Korean dramas had exposed them to the country's culture, while 49 said that their friends and family had helped to spark their interest. In addition, fewer people identified television (seven), cartoons and anime (five), newspapers (two), and manga and manhwa (one) as their sources for learning about Korean culture. This study emphasises the internet's critical function in promoting and transmitting Korean culture to a worldwide audience as it becomes the source that predominates information about Korea. This study advances knowledge of the Korean wave's ability to cross boundaries and enthral fans everywhere by revealing these important findings.

   The data from the 230 responses obtained showed interesting trends. Among the 96 participants, a sizable majority said they mostly learn about Korean culture online as shown in the figure 1. This demonstrates the significant influence of the internet as a vital channel for disseminating and adopting Korean cultural content. The study also pinpointed additional significant sources of Korean cultural influence.

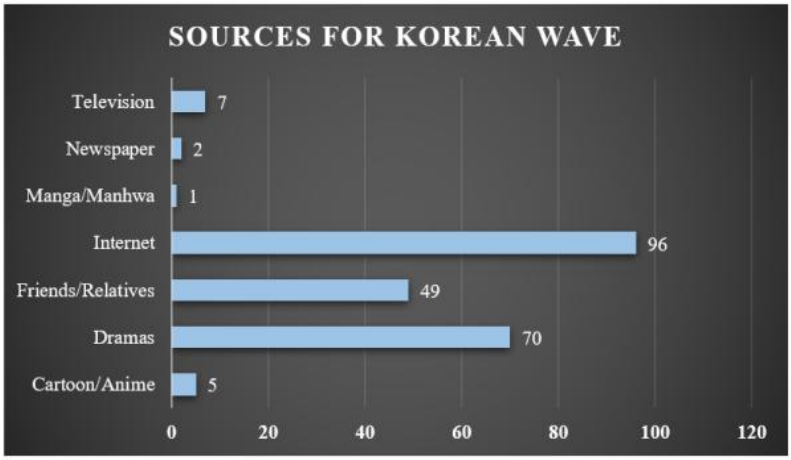

Figure 1

2. **Phase 2- Time Preference for Watching Korean Content:** The study's findings show how widely popular the Korean wave is among South Indians. This study's main goal is to learn about people's preferences for when to watch Korean content on a daily basis. Valuable insights were gleaned through the study of 230 replies. The data from the 230 participants showed interesting trends in viewers' watching choices. Surprisingly, 114 respondents said they preferred to watch Korean entertainment anytime they wanted to, showing that they don't have set timetables or established viewing patterns. This result, shown in Figure 2, highlights the adaptability and impulsiveness of their Korean content consumption.

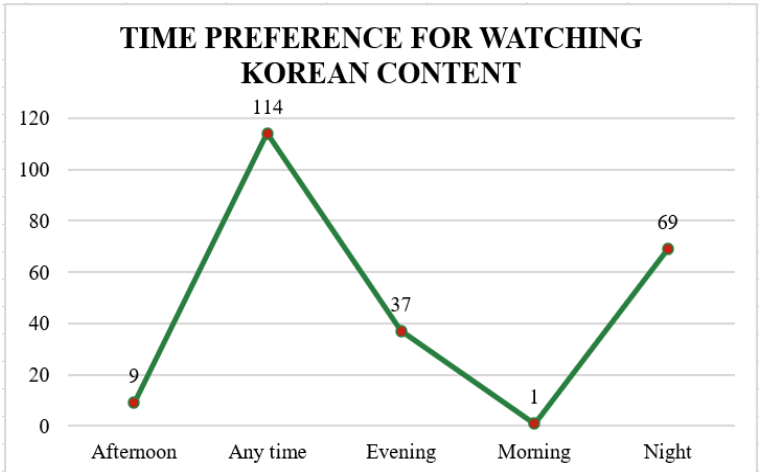

Figure 2

Additionally, the study pinpointed precise times when respondents interact with Korean information. 37 of the participants said they enjoyed watching it in the evening, while 69 said they watched it mostly at night. Only one respondent mentioned the morning, whereas a lower percentage of participants (9) picked the afternoon. These results provide insight into the varied tastes of South Indian viewers for Korean content. The study underlines the pattern where a sizable percentage of respondents choose on-demand viewing, adjusting their intake of Korean material to their personal convenience

rather than sticking to set schedules. This approach expands our understanding of how the Korean wave captivates and resonates with South Indian audiences.

3. **Phase 3- Similarity in Culture:** According to recent research, it is clear that the Korean wave, which includes Korean dramas, films, and music, has had a big impact on South Indians. The main goal of this analysis is to examine this phenomena by evaluating how people view the cultural similarities between Indian and Korean societies. Figure 3 shows the intriguing results relating these cultural perspectives among the 230 respondents. A total of 122 participants expressed the opinion that South Korea and South India's cultures are not comparable. This realisation emphasises the apparent distinctions between the two cultures, indicating that South Koreans' way of life, traditions, and customs are different from South Indians'.

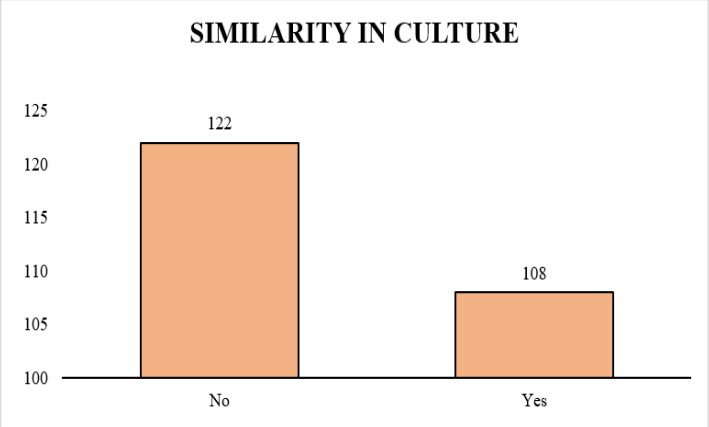

Figure 3

This study advances knowledge about how South Indians perceive and engage with Korean culture by dissecting these perceptions. It highlights the continued acknowledgement of unique cultural identities between South Korea and South India despite the enormous influence of the Korean wave. In the context of the Korean wave's effects on South Indians, these findings provide insightful information about the complex dynamics of cross-cultural influence and the value of cultural individuality.

4. **Phase 4- Korean Popularity in the South India:** Numerous factors, including the Internet, dramas, friends, and family, among others, have a noticeable impact on the South Indian people. In this survey, participants were asked to rate how popular Korean dramas, music, films, and cuisine were in order to determine the extent of the Korean wave's influence in southern India. The responses of the respondents are shown visually in Figure 4. Out of the 230 participants, 19 stated that their reaction to the Korean wave was unpopular, while a large percentage of 124 stated that it was popular. Furthermore, an even greater percentage of 87 respondents stated that their reaction to the Korean wave was quite popular. According to the findings shown in Figure 4, a sizable portion of the studied population believes that South Indians enjoy Korean dramas, films, music, and cuisine. This indicates that the Korean wave has gained a lot of traction and resonance in the area.

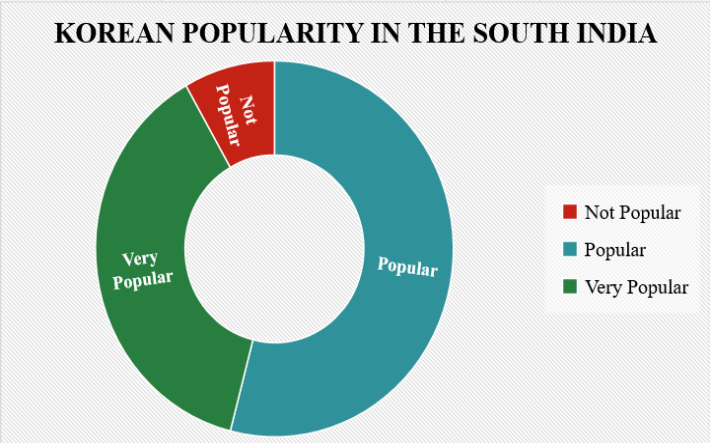

Figure 4

These results highlight how popular Korean cultural content is in South India and offer light on the various elements that contribute to its popularity. A greater understanding of the Korean wave's effects on South India's cultural environment is made possible by the research, which provides insightful information about consumption and acceptance trends.

5. **Phase 5- Influence of South Indians:** The main goal of this essay is to thoroughly examine how the Korean wave has affected people in South India. Respondents were asked a crucial question, "In your opinion, does the Korean wave influence South Indians?" in order to glean information. Intriguing results from the survey replies are shown in Figure 5. A significant 73% of responders acknowledged the effect of the Korean wave on South Indians by answering in the positive. A different viewpoint was voiced by 27% of the respondents, who said they saw little to no impact from the Korean wave on the region.

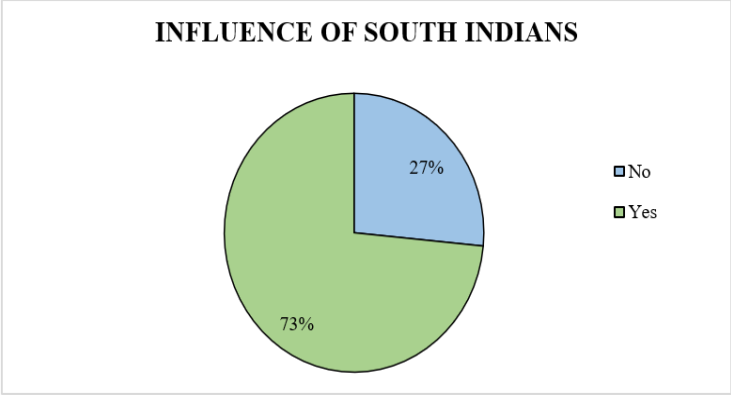

Figure 5

This study has provided important new information about how South Indians perceive and are affected by the Korean wave. The study contributes to a thorough understanding of how Korean culture resonates with and influences the South Indian populace by putting light on both supportive and critical opinions. The findings offer a

nuanced viewpoint on the intricate interplay between cultural influences and the many responses they elicit in the region.

IV. CROSS TABULATION

Cross-tabulation procedures were used in this study to extensively investigate participant perspectives and opinions. The participant survey replies were a valuable source of information for doing this research. Cross-tabulation gave the researchers a clearer understanding of the connections and patterns in the data, enabling a thorough examination of the participants' viewpoints on the research topic. By allowing for a systematic comparison and interpretation of the survey replies, this analytical technique strengthens the validity and robustness of the study and provides a more nuanced knowledge of the participants' perspectives.

1. **Analysis of Korean Content:** There can determine how many respondents fall into each category together with the specific habits they have developed from watching Korean content by analysing the data shown in Table 1, which compares categories and shows respondents' preferences based on their exposure to Korean content.

Table 1

Category	ANALYSIS OF KOREAN CONTENT					Total
	All of the Above	Food (Trying out new Korean dishes you see in the k-drama)	Language (Like Gomawo, Anneyong, etc.,)	Posing	Style	
College Student	28	9	23	23	30	113
Other	4	2	1	1	0	8
School student	26	4	12	8	13	63
Working professional	19	3	5	6	13	46
Total	77	18	41	38	56	230

2. **Influence of Korean Wave:** According to the data presented in Table 2, it appears that a higher proportion of female respondents believe that the Korean wave has a stronger influence on South Indians compared to male respondents.

Table 2

Gender	Influence of South Indians		Total
	No	Yes	
Female	46	138	184
Male	15	31	46
Total	61	169	230

V. DATA ANALYSIS: MCDM ALGORITHM

- Data collection
- Fixing the beneficial and non-beneficial factors
- Find normalization based on beneficial and non-beneficial factors: The terms "beneficial" and "non-beneficial" refer to features that give more significance to certain factors and less significance to certain factors respectively.
  Non Beneficial- $\text{Min}(X_{ij}) / X_{ij}$
  Beneficial- $X_{ij} / \text{Max}(X_{ij})$
- Find the weightage normalization: All the attributes of the table are given equal weightage as each preference of an individual is equally important.
  Weightage- 100 / number of columns
- Find ranking using Multi - Criteria decision method of the TOPSIS method.
- Visualization of the dataset by using Python Programming.

1. Ranking for Age Group Attracted to South Korea

Step 1: A crosstabulation of the factors that draw people to South Korea is given in Table 3, with the data divided by age groups.

Table 3

Age	Attracted to South Korea				
	Culture	**Food**	**Idols**	**Lifestyle**	**Products**
10-15	5	9	23	12	2
16-20	9	6	14	20	6
21-25	13	11	16	52	13
26-30	3	5	1	1	1
Above 30	2	3	0	1	2

Step 2: List the criteria that are used to discriminate between beneficial and unbeneficial elements. In this sense, "beneficial" and "non-beneficial" relate to qualities that prioritise the desires of individuals first. Due to their good effects, a way of life, a culture, and idols are deemed beneficial, but food and objects are deemed unbeneficial due to perceived negative effects.

Table 4

Age	Beneficial	Non-Beneficial	Beneficial	Non-Beneficial	Non-Benefical
	Culture	**Food**	**Idols**	**Lifestyle**	**Products**
10-15	5	9	23	12	2
16-20	9	6	14	20	6
21-25	13	11	16	52	13
26-30	3	5	1	1	1
Above 30	2	3	0	1	2

Step 3: In this step, the algorithm's normalisation formula is used to compute normalised values using the advantageous and unbeneficial factors. In this step, the algorithm's normalisation formula is used to compute normalised values using the advantageous and unbeneficial factors.

Table 5

Age	Beneficial	Non-Beneficial	Beneficial	Non-Beneficial	Non-Benefical
	Culture	Food	Idols	Lifestyle	Products
10-15	0.38461585	0.3333333	1	0.23076923	0.5
16-20	0.692307692	0.5	0.608695652	0.38461538	0.16667
21-25	1	0.272727273	0.695652174	1	0.076923077
26-30	0.230769231	0.6	0.043478261	0.01923077	1
Above 30	0.153846154	1	0	0.01923077	0.5

Step 4: The weighted normalised values are then calculated by using the weightage algorithm. This important step is computing the normalised value for each data point while accounting for their individual weights. To get this result, the algorithm's weightage normalisation formula is applied.

Table 6

Weightage	0.25	0.25	0.25	0.25	0.25	Total
Age	Beneficial	Non-Beneficial	Beneficial	Non-Beneficial	Non-Benefical	
	Culture	Food	Idols	Lifestyle	Products	
10-15	0.096153846	0.083333	0.25	0.0576931	0.125	0.61218
16-20	0.173076923	0.125	0.152173913	0.9615385	0.041666667	0.58807
21-25	0.25	0.068181818	0.173913043	0.25	0.019230769	0.76133
26-30	0.057692308	0.15	0.010869565	0.00480769	0.25	0.46337
Above 30	0.038461538	0.25	0	0.00480769	0.125	0.41827

Step 5: The next step is to rank the total values. The calculated total values are ordered by placing them in decreasing order, with the highest value receiving the top rank and all other values following it in descending order as shown in the table 7.

Table 7

Age	Total	Rank
10-15	0.612179487	2
16-20	0.588071349	3
21-25	0.761325631	1
26-30	0.473369565	4
Above 30	0.418269231	5

Step 6: In Step 5, a visual representation of the dataset is used to show how attractive South Korea is to people of different ages, with a special emphasis on people between the

ages of 21 and 25. The columns "culture," "idols," and "lifestyle" are regarded as positive qualities in this visualisation, which use the TOPSIS approach. Figure 6 makes clear that the age range of 21 to 25 years demonstrates a considerably high level of attraction towards the Korean wave, mostly due to their liking for the Korean way of life.

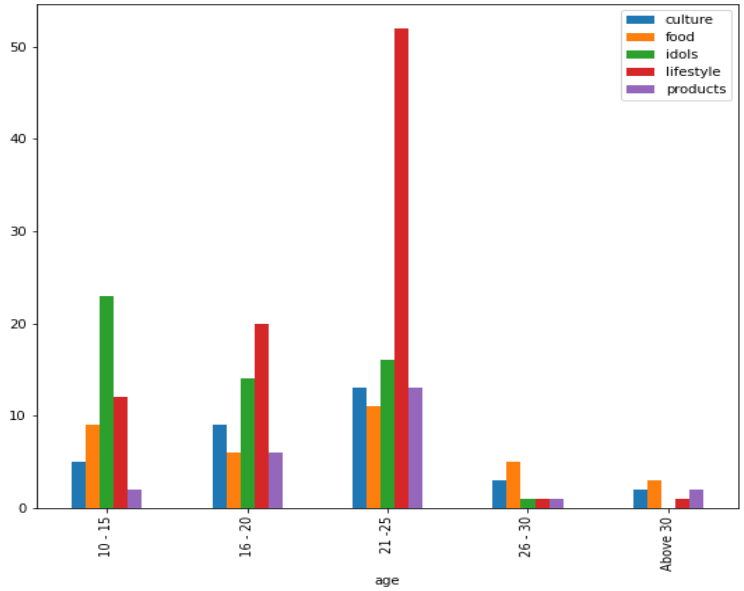

Figure 6

2. Ranking for Age Group Influenced by Korean Wave

Step 1: A crosstabulation analysis, shown in Table 9, looks at how the Korean wave has affected people from South India who are divided into various age groups. The table offers details on how the Korean wave's impact differs across various age demographics in the South Indian region.

Table 8

Age	Influence of South Indians	
	No	**Yes**
10-15	9	42
16-20	12	41
21-25	33	72
26-30	5	11
Above 30	2	3

Step 2: The criteria for classifying the factors as "Beneficial" and "Non-Beneficial" are based on the weight given to individual opinions. The table below specifically categorises elements as "Beneficial" in the context of the Korean wave's impact on the South Indian populace when they are connected to those who think the Korean wave has an impact on them. On the other hand, the "Non-Beneficial" category relates to elements related to people who don't see the Korean wave as having any influence.

Table 9

Age	Non - Beneficial	Beneficial
	No	Yes
10-15	9	42
16-20	12	41
21-25	33	72
26-30	5	11
Above 30	2	3

Step 3: In this stage, the algorithm's Beneficial and Non-Beneficial formula is used to carry out the normalisation process. The normalised values are calculated using this formula, which takes into account the impact of both positive and negative influences on the dataset. This method allows for fair comparisons and analysis by producing a balanced and standardised representation of the data.

Table 10

Age	Non - Beneficial	Beneficial
	No	Yes
10-15	0.22222222	0.5833333
16-20	0.166667	0.5694444
21-25	0.060606061	1
26-30	0.4	0.15277778
Above 30	1	0.04166667

Step 4: This step involves applying the algorithm's weightage formula to compute the weighted normalised values. The relative relevance of various elements is taken into consideration in the weighted normalisation of the data by using this formula. As a result, the dataset is more accurately represented and thoroughly understood. This approach makes sure that each factor's impact is well balanced.

Table 11

Weightage	0.5	0.5	Total
Age	Non - Beneficial	Beneficial	
	No	Yes	
10-15	0.1111111111	0.402778	0.402778
16-20	0.8333333	0.368056	0.368056
21-25	0.03030303	0.530303	0.530303
26-30	0.2	0.276389	0.276389
Above 30	0.5	0.520833	0.520833

Step 5: The results of the entire values are ranked in this particular stage. As seen below, the ranking is done in descending order, starting with the highest total value earning the top position and moving downward from there.

Table 12

Age	Total	Rank
10-15	0.402778	3
16-20	0.368056	4
21-25	0.530303	1
26-30	0.276389	5
Above 30	0.520833	2

Step 6: Interesting insights can be gleaned from the dataset's visualisation in Figure 7. Individuals between the ages of 10 and 20 specifically replied with a higher frequency of "Yes" than "No." Similarly, albeit to a lesser extent, respondents between the ages of 26 and over 30 years also showed a similar tendency. The cohort of respondents between the ages of 21 and 25 showed the highest amount of effect from the factors taken into consideration, making them the most influenced age group among the respondents.

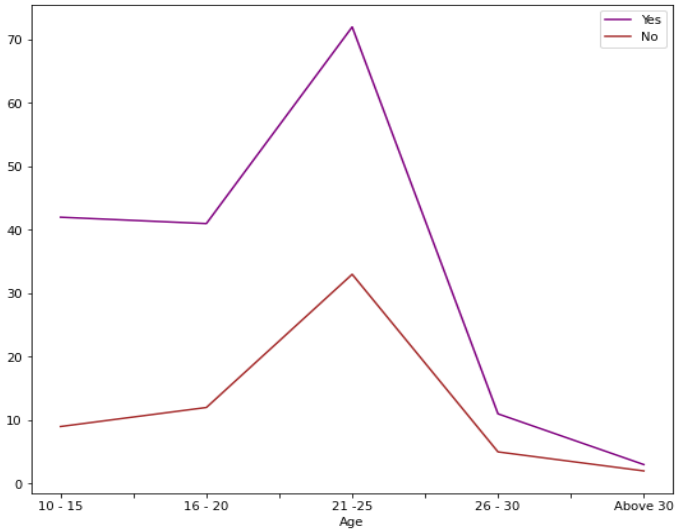

Figure 7

VI. CONCLUSION

According to a survey with 230 samples, those between the ages of 21 and 25 were the most interested in watching Korean content. In contrast to men, women were more drawn to the Korean wave, and college students showed a strong interest in Korean culture. The internet served as the main resource for learning about Korean culture, with K-dramas being the most widely-watched content, particularly in the romance genre. People were lured to the South Korean way of life and typically engaged with Korean content for less than an hour each day, with no preference for particular times of day. The primary reason why people loved the K-pop group BTS was because of their songs. South India was considered as a well-liked centre for Korean dramas, films, music, and cuisine, despite the widespread belief that South Indian and South Korean cultures were not directly comparable. Many respondents concurred that South Indian audiences helped South Korean actors, musicians, and entertainers become famous. Their daily lives were affected by Korean content in ways like

eating, language, and posing. Overall, the TOPSIS approach found that the age group most drawn to and influenced by the Korean wave was between 21 and 25 years old.

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