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The application of the Analytic Hierarchy Process method to the selection of dominant factors for adolescents who are prone to insecurity

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Abstract

Teens are often stressed, worried, and overly insecure as a result of their high expectations. The feelings that occur during adolescent development can create and increase feelings of insecurity in their lives, which has a negative impact. Adolescents with an excessive sense of insecurity can suffer from mental disruption, which can lead to serious mortality. Of course, these factors can have a negative impact on adolescents' mental health. Adolescents' minds and psyches can be disrupted by mental illness. The goal of this study is to identify the dominant factor among a number of factors that can lead to insecurity when using the Decision Support System (DSS) technique. Analytical Hierarchy Process is the DSS method used (AHP). The data used in this study was gathered through observations and interviews with adolescents using a random questionnaire. Six factors were derived from observations and interviews: social environmental factors (A1), family environmental factors (A2), social media factors (A3), insecure factors (A4), trauma factors (A5), and education and work factors (A6). The results of the AHP method show that the main factors for adolescents who are easily insecure are social environmental factors (first), social media factors (second), and family environmental factors (third) (third).

Keywords: *Decision Support System, AHP Method, Insecurer, Teenagers, Insecure Factors*

1. Introduction

Adolescence is a developmental stage that all humans go through between the ages of 12 and 23 years. It is a time of stress, upheaval, conflict, and mood swings, and is also known as the transition period from childhood to adulthood. contains significant physical, cognitive, and psychosocial changes [1][2]. The transition from childhood to adulthood is frequently characterized by a personality crisis in search of self-identity, as well as the emergence of various behaviors such as social stress, depression, and insecurity. Teens are often stressed, worried, and overly insecure as a result of their high expectations. The feelings that occur during adolescent development can create and increase feelings of insecurity in their lives, which has a negative impact.

Insecurity is defined as a fear of something that is triggered by dissatisfaction and uncertainty about one's own ability. Insecurity is an emotion that occurs when a person believes that he or she is inferior to others [3]. One of the primary reasons why someone feels insecure or comfortable is that they tend to underestimate and are insecure of themselves. When a person is self-conscious about his or her skin color, height, or weight, the face shape is not what you want. Adolescents' feelings of insecurity are not solely caused by insecurity factors that arise from within them. Various factors, such as social environmental factors, family environmental factors, social media factors, trauma factors, and so on, influence the emergence of insecurity in adolescents. Adolescents with an excessive sense of insecurity can suffer from mental disruption, which can lead to serious mortality. These factors can undoubtedly be detrimental to adolescent mental health and

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disrupt the mind and psyche of adolescents. Adolescents with this disorder have difficulty thinking clearly in their daily activities. Insecure feelings, on the other hand, can be overcome by always thinking positively, loving yourself, not comparing yourself to others, and overcoming or avoiding factors that can trigger insecure feelings.

Based on the foregoing, the author attempts to employ the decision support system (DSS) technique in analyzing the main factors of adolescents who are prone to insecurity. This study employs the Analytical Hierarchy Process (AHP) method, which is part of the DSS, because it has many advantages, one of which is that it can be graphically depicted so that all parties involved in decision making can easily understand it [4][5]. AHP is a decision-making method that involves a number of criteria and alternatives that are chosen in a hierarchical order based on the consideration of all related criteria. [6] Formal paraphrase Several studies, such as [7], have used the AHP method to determine the factors for determining housing location. According to the findings of this study, the most important indicators are land price, environmental atmosphere or environmental conditions in the housing location, permits, and KPR. Then, from the dominant factors that influence the developer's decision, 100 percent from the aspect of land prices, 80 percent from the aspect of environmental atmosphere, 50 percent from the aspect of licensing, and 40 percent from the aspect of KPR, 20 percent from the aspect of road conditions, trade, and services, and 10 percent from the aspect of market segment aspects. [8] and [9] make use of the AHP method in conjunction with the TOPSIS method in their decision making.

Based on the benefits of the AHP method, it is expected that the study results will analyze the main factors of adolescents who are prone to feeling insecure, so that the results obtained will be input for the community, particularly adolescents, to better understand and overcome the factors that can cause youth to feel insecure.

2. Research Methodology

This research uses a Decision Support System which is an interactive information system that provides information, modeling, and data manipulation. The system is used for decision making in semi-structured and unstructured situations, where no one knows exactly how decisions should be made [6]. Various settlement methods are offered in a decision support system. This study uses the AHP method in determining the factors that adolescents are prone to insecure.

The AHP Method is a multi-criteria decision-making model that can aid in the human mindset where a systemic process can optimize logical factors, knowledge, emotions and feelings. AHP is essentially a way of solving complex and unstructured issues by arranging groups in a hierarchy [10] in groups. The main factors that make adolescents prone to insecurity are determined in the following stages using the AHP method [11][12]:

a) Identify the key causes of insecurity for teens.
b) Set these criteria in pairs as a matrix.
c) Add each column's values to the matrix.
d) Divide the number of matrices for matrix standardization by each column value.
e) Calculate the criteria's priority value by the formula for the addition of the result matrix in step 4 rows and the results of five divided by number of criteria.
f) Test the consistency of each matrix coupled with the formula in step 2, multiplied by the criteria's priority value for each matrix element coupled. Every row results are added, then each criterion results is μ1, β2, μ3.....βn. The results are added.
g) Calculation of the formula of the coherence index (CI):
$$CI=(\lambda \text{ maks-n})/n-1 \quad (1)$$
h) The consistency ratio, calculated by the formula:
$$CR = CI/RI \quad (2)$$

If CR0.1, a comparison value is inconsistent in pairing with the given criteria matrix. If consistency is lacking, the filling of the values must be repeated in the paired matrix of the criteria element.

i) As value used for decision-making on the highest score, the final result is a global priority.

3. Result and Discussion

The data for this study were gathered through field observations and the distribution of questionnaires to determine the factors that would be used. More than 150 adolescents aged 17 to 23 years old were asked to complete questionnaires. Several factors will be derived from the distributed questionnaires, namely:

1) Environmental Social Factors (A1).
2) Environmental Factors in the Family (A2).
3) Factors Influencing Social Media (A3).
4) The Uncertainty Factor (A4).
5) Trauma (A5).
6) Factors Influencing Education and Occupation (A6)

It will then be processed using the AHP method based on the various factors obtained:

a) Form a decision matrix out of the criteria. Criteria are determined through a comparison of criteria that is weighted based on their importance.

Table 1. Decision Matrix factors adolescents prone to insecure

Criteria	A1	A2	A3	A4	A5	A6
A1	1	3	1	4	3	2
A2	0,3333	1	0,3333	0,3333	0,2000	0,5000
A3	1	3	1	0,3333	0,3333	0,3333
A4	2	3	3	1	1	0,3333
A5	3	5	3	1	1	0,3333
A6	2	2	0,3333	3	3	1
Total	9,3333	17	8,6667	9,6667	8,5333	4,5000

b) The resulting value for dividing the number of columns with the formula for each cell in table 1 after entering the data in table 1 above.

c) To obtain the normalized value, divide each element in the column by the appropriate number of columns.

$$A1=\frac{Value\ of\ comparison\ criteria\ matrix\ for\ row\ 1\ column\ 1}{Number\ of\ Columns\ 1} \quad (3)$$

$1,1=\frac{1}{9,3333}=0,1071$

$1,2=\frac{0,3333}{9,3333}=0,0357$

$1,3=\frac{1}{9,3333}=0,1071$

$1,4=\frac{2}{9,3333}=0,2143$

$1,5=\frac{3}{9,3333}=0,3214$

$1,6=\frac{2}{9,3333}=0,2143$

And so on until the normalization results are obtained for all the following criteria:

Table 2. Normalization Matrix

Criteria	A1	A2	A3	A4	A5	A6
A1	0,1071	0,1765	0,1154	0,4138	0,3516	0,4444
A2	0,0357	0,0588	0,0385	0,0345	0,0234	0,1111

Criteria	A1	A2	A3	A4	A5	A6
A3	0,1071	0,1765	0,1154	0,0345	0,0391	0,0741
A4	0,2143	0,1765	0,3462	0,1034	0,1172	0,0741
A5	0,3214	0,2941	0,3462	0,1034	0,1172	0,0741
A6	0,2143	0,1176	0,0385	0,3103	0,3516	0,2222

d) After the matrix normalization results are obtained, add up each row in the matrix.
A1=0,1071+0,1765+0,1154+0,4138+0,3516+0,4444=1,6088
A2=0,0357+0,0588+0,0385+0,0345+0,0234+0,1111=0,3020
A3=0,1071+0,1765+0,1154+0,0345+0,0391+0,0741=0,5466
A4=0,2143+0,1765+0,3462+0,1034+0,1172+0,0741=1,0316
A5=0,3214+0,2941+0,3462+0,1034+0,1172+0,0741=1,2564
A6=0,2143+0,1176+0,0385+0,3103+0,3516+0,2222=1,2545

e) The weight of each criterion is then determined by dividing the number of rows by the number of elements or criteria:
The weight A1=1,6088/6=0,2681
The weight A2=0,3020/6=0,0503
The weight A3=0,5466/6=0,0911
The weight A4=1,0316/6=0,1719
The weight A5=1,2564/6=0,2094
The weight A6=1,2545/6=0,2091

f) Taking the elements in the matrix column and multiplying them by the weight of the corresponding criterion.

A1: a1= 1×0,2681 = 0,2681
a2= 0,3333×0,2681 = 0,0894
a3= 1×0,2681 = 0,2681
a4= 2×0,2681 = 0,5363
a5= 3×0,2681 = 0,8044
a6= 2×0,2681 = 0,5363

and so on until results are obtained for all criteria:

Table 3. Criteria Consistency Matrix

Criteria	A1	A2	A3	A4	A5	A6	Total
A1	0,2681	0,1510	0,0911	0,6877	0,6282	0,4182	2,2444
A2	0,0894	0,0503	0,0304	0,0573	0,0419	0,1045	0,3738
A3	0,2681	0,1510	0,0911	0,0573	0,0698	0,0697	0,7071
A4	0,5363	0,1510	0,2733	0,1719	0,2094	0,0697	1,4116
A5	0,8044	0,2517	0,2733	0,1719	0,2094	0,0697	1,7804
A6	0,5363	0,1007	0,0304	0,5158	0,6282	0,2091	2,0204

g) Each row's number is divided by the corresponding priority. The sum of each row above is then divided by the corresponding priority:Hasil bagi prioritas bersangkutan A1= 2,2444/0,2681=8,3704
The results for the priority concerned A2= 0,3738/0,0503=7,4261
The results for the priority concerned A3= 0,7071/0,0911=7,7611
The results for the priority concerned A4= 1,4116/0,1719=8,2101
The results for the priority concerned A5= 1,7804/0,2094=8,5025
The results for the priority concerned A6= 2,0204/0,2091=9,6630

h) Calculating λmaks by adding the result of division in step 8 then dividing by the number of elements (n=6). λmaks = 8,3704+7,4261+7,7611+8,2101+8,5025+9,6630/6= 8,3222

i) Calculating the Consistency Index with the formula CI=(λmaks –n)/n-1 CI=(8,3222 - 6)/6-1=0,4644

j. Calculate the consistency ratio with the following formula that the criterion consistency ratio value is value 0,4644

Following the processing of the priority criteria data, the data is then processed to determine the intensity of the criteria using criteria comparison data based on the questionnaire results.

Table 4. Criteria Intensity Comparison Matrix

Criteria	A1	A2	A3	A4	A5	A6
A1	1	5	7	1	5	1
A2	0,2500	1	5	3	1	3
A3	0,1429	0,2000	1	7	5	3
A4	1	0,3333	0,1429	1	3	1
A5	0,2000	1	0,2000	0,3333	1	3
A6	1	0,3333	0,3333	1	0,3333	1
Total	3,3929	6,8667	13,4762	13	14,3333	9

The same method is used in the processing process as in the preceding process, beginning with c, d, e, f, g, h, and i. The consistency ratio is then calculated using the following formula:

CR=CI/RC, with RC is consistency random with a value of 1.24 because the matrix size in this case is 6. As a result, the CR value can be calculated as follows:

CR = CI/RC = 0.57081/1,24 = 0.4604

According to the calculation results, the consistency ratio of the criteria intensity is 0.4604 and the intensity consistency value is less than or equal to 0.1, indicating that the process can be continued to look for global priorities. To determine the global priority priority for each intensity, multiply the priority value by the corresponding priority criteria:

Global priority value of intensity A1 = 0.3465/0.2091 = 1,6574
Global priority value of intensity A2 = 0.2040/0.2091 = 0,9758
Global priority value of intensity A3 = 0.2277/0.2091 = 1,0889
Global priority value of intensity A4 = 0.1252/0.2091 = 0,5988
Global priority value of intensity A5 = 0.1080/0.2091 = 0,5167
Global priority value of intensity A6 = 0.0966/0.2091 = 0,4618

The results are then divided by the highest priority. The next step is to divide the highest priority after obtaining the global priority value for each intensity. The intensity factor value has the highest value of the four priority values above, with a value of 1.6574, so the quotient for each intensity can be calculated as follows:

1) Environmental Social Factors (A1) = 1,6574/1,6574=1
2) Environmental Factors in the Family (A2) = 0,9758/1,6574=0,5888
3) Factors Influencing Social Media (A3) = 1,0889/1,6574=0,6570
4) The Uncertainty Factor (A4) = 0,5988/1,6574=0,3613
5) Trauma (A5) = 0,5167/1,6574=0,3117
6) Factors Influencing Education and Occupation (A6) = 0,4618/1,6574=0,2786

Table 5. Ranking Results

Factor	Global Priorities Intensity	Biggest Priority	Rank
A1	1,6574	1	1
A2	0,9758	0,5888	3
A3	1,0889	0,6570	2
A4	0,5988	0,3613	4

Factor	Global Priorities Intensity	Biggest Priority	Rank
A5	0,5167	0,3117	5
A6	0,4618	0,2786	6

According to table 5, the A1 factor, namely the social environmental factor, is the most important for adolescents who are easily insecure, followed by the A3 factor, namely the Social Media Factor, and the third A2 factor, namely the Family Environmental Factor. According to the results of the questionnaire distribution, 38 percent of adolescents aged 17 to 23 years strongly agree that the main source of adolescents who are easily insecure is their social environment.

4. Conclusion

The AHP method was used to analyze the factors of adolescents who are prone to insecurity by following the data processing process through several steps such as determining the value of the criteria consistent matrix, the Global Intensity Priority Value, and the Biggest Priority Value. The same results were obtained based on the results of data processing using the AHP method and the results of distributing questionnaires to adolescents aged 17-23 years, namely social environmental factors, which are the first main reasons why adolescents are prone to insecurity.

References

[1] R. A. Purnama and S. Wahyuni, "Kelekatan (Attachment) pada Ibu dan Ayah Dengan Kompetensi Sosial pada Remaja," *J. Psikol.*, vol. 13, no. 2010, 2017.

[2] S. Fitri and A. Masturah, "Pengaruh Layanan Konseling Kelompok Dengan Teknik Problem Solving Untuk Mengatasi Konflik Antara Remaja Yang Memiliki Insecure Attachment Dengan Orang Tua," *J. Bimbing. dan Konseling*, vol. 8, no. 1, pp. 102–112, 2019.

[3] U. Mu'awwanah, "PERILAKU INSECURE PADA ANAK USIA DINI," *J. Pendidik. Anak Usia Dini*, vol. 2, no. 1, pp. 47–58, 2017.

[4] M. S. Rais, "Sistem Pendukung Keputusan Untuk Pemilihan Lokasi Perumahan Menggunakan Analytical Hierarchy Process (AHP)," *J. OfComputer Sci.*, vol. 2, no. 2, pp. 59–72, 2016.

[5] S. Rakasiwi, "Sistem Pendukung Keputusan Dalam Menentukan Penilaian Kinerja Guru Dengan Metode Analytical Hierarchy Process (AHP)," *J. SIMETRIS*, vol. 9, no. 2, pp. 1001–1008, 2018.

[6] R. A. Suherdi, R. Taufiq, and A. A. Permana, "Penerapan metode ahp dalam sistem pendukung keputusan kenaikan pangkat pegawai di badan kepegawaian dan pengembagan sumber daya manusia kota tangerang," *Pros. SINTAK*, pp. 522–528, 2018.

[7] H. R. Agustapraja and S. A. Rosidah, "Faktor penentuan lokasi perumahan dengan metode ahp di kabupaten lamongan," *J. Tek. Sipil Univ. Teuku Umar*, vol. 6, no. 1, pp. 76–86, 2020.

[8] D. R. Sari, A. P. Windarto, D. Hartama, and Solikhun, "Sistem Pendukung Keputusan untuk Rekomendasi Kelulusan Sidang Skripsi Menggunakan Metode AHP-TOPSIS," *J. Teknol. dan Sist. Komput.*, vol. 6, no. November 2017, pp. 1–6, 2018, doi: 10.14710/jtsiskom.6.1.2018.1-6.

[9] A. A. Chamid and A. C. Murti, "Kombinasi Metode Ahp Dan Topsis Pada Sistem Pendukung Keputusan," *Pros. SNATIF*, pp. 115–119, 2017.

[10] D. Wira, T. Putra, and M. Epriyano, "Sistem Pendukung Keputusan Pemilihan Sepeda Motor Jenis Sport 150cc Berbasis Web Menggunakan Metode Analytical Hierarcy Process (AHP)," *J. TEKNOIF*, vol. 5, no. 2, pp. 16–24, 2017, doi: 10.21063/JTIF.2017.V5.2.16-24.

[11] G. P. Sanyoto, R. I. Handayani, and E. Widanengsih, "Sistem Pendukung Keputusan

Pemilihan Laptop Untuk Kebutuhan Operasional Dengan Metode Ahp (Studi Kasus: Direktorat Pembinaan Kursus Dan Pelatihan Kemdikbud)," *J. Pilar Nusa Mandiri*, vol. 13, no. 2, pp. 167–174, 2017.

[12] I. Mawaddah, "Sistem Pendukung Keputusan Faktor-Faktor Penyebab Keterlambatan Audit Pada Perusahaan Menerapkan Metode AHP (Studi Kasus: Kantor Akuntan Publik)," *TIN Terap. Inform. Nusant.*, vol. 1, no. 2, pp. 91–98, 2020.