RESEARCH ARTICLE

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The Relationship between Ethnicity and Health Seeking Behavior for Colorectal Cancer in East Java, Indonesia: A Case Study of Arek, Mataraman, and Pendalungan Ethnic Groups

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Abstract

Objective: The rising incidence of colorectal cancer (CRC) in East Java has highlighted the need to investigate inter-ethnic causality. Previous studies have examined the relationship between ethnicity and health behavior in relation to CRC in East Java Province, but it is important to explore health-seeking behavior among CRC patients within the Arek, Mataraman, and Pendalungan ethnic groups, as these groups may have different behavioral patterns due to limited literacy. **Methods:** This cross-sectional study included 230 respondents, with 86 from Arek, 72 from Mataraman, and 72 from Pendalungan. Data were collected from August 1 to October 30, 2022,, and analyzed using structural equation modeling with SmartPLS application analysis. **Result:** The P-values for the direct path between culture and health-seeking behavior was 0.009, indicating a statistically significant relationship. Similarly, the P-Values for the direct path between self-health awareness and health seeking behavior is 0.000, indicating a very strong and statistically significant relationship. P-Values for the direct path between health accessibility and health seeking behavior was 0.257, suggesting that the relationship was not statistically significant. **Conclusion:** Cultural values and self-health awareness are suggested as important predictors of health-seeking behavior among CRC patients in East Java.. The study highlights the need for tailored healthcare services for different ethnic groups. Overall, these findings can help healthcare providers in addressing the specific needs of CRC patients in East Java.

Keywords: Colorectal Cancer- health seeking behavioral- east java ethnic groups

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Introduction

Colorectal cancer (CRC) is the third most common malignant disease worldwide and the second leading cause of death after lung cancer (Bishehsari et al., 2014; Sung et al., 2021). In Indonesia, CRC is the fourth most common type of cancer, with 22,187 cases reported in 2020 (Kementerian Kesehatan Republik Indonesia, 2018, 2020).

Early-stage CRC has a survival rate of 90% at five years; however, his rate drops to only 14% when it reaches an advanced stage (American Cancer Society, 2020). Therefore, self-examination awareness at symptom onset is crucial in order to reduce morbidity and mortality rates among CRC patients (Saulle et al., 2020).

Health-seeking behavior is defined as a series of actions taken by an individual to address a perceived illness. The seeking treatment behavior involves two goals: suggesting treatment and receiving advice on disease treatment continuation and restoring health to its pre-illness condition (Pushpalata and Chandrika, 2017). Predisposing, enabling, and reinforcing factors can influence health-seeking behavior, and socio-cultural factors also play a significant role (Saulle et al. , 2020).

Predisposing factors, such as knowledge of disease symptoms, and enabling factors, such as ease of treatment, are important considerations in health-seeking behavior.

H.L. Blum's theory proposes that genetics, environment, health facilities, and socio-culture all play a role in determining health status and influencing health-seeking behavior.

Culture is a particularly a significant factor in shaping health-seeking behavior, but cultural patterns vary across regions. Hence, when designing activities or programs for a particular area, cultural nuances must be taken into account (Adunlin et al., 2019; Widayanti et al., 2020).

East Java is home to approximately 40 million people and has several distinct cultural regions, including Mataraman, Arek, and Pendalungan (Zoebazary, 2017). The latter is located in the horseshoe area of East Java

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(Besuki) and is the result of a cultural compromise between the Madurese people in the North and Javanese people in the South. As such, it exhibits unique community characteristics that must be considered when developing healthcare initiatives (Dharma et al., 2020).

According to Susilo (2017),the Arek ethnic group is predominantly a Javanese "rough (ngoko)" society with a distribution area around Surabaya and Malang. Despite their tough character, they are a complex ethnic group with significant cultural dominance in East Java, comprising 42% of the total population of East Java or approximately 13.9 million people (BPS, 2023) (BPS, 2023).

The Arek people possess a characteristic that makes negotiation easy for them, which facilitates top-down behavioral change processes. if a community group such as an RW or village has a stakeholder with strategic policies, the community structure below it will easily follow it, whether with a sense of relief or reluctance. On the other hand, the Mataraman ethnic group is also a Javanese society but heavily influenced by the culture of Central Java/Yogyakarta, known as bagongan/krama/basa (Susilo, 2017). The Mataraman people usually live in the southwest region of East Java covering areas around Madiun, Pacitan, and Kediri.

They comprise 37.8% of the total population or around 9.1 million people (BPS, 2023). Similar to the Arek ethnic group, the Mataraman people are more negotiable and easier to accept new information but have a more refined personality. Therefore, stakeholders can engage them more easily using the Bottom-Up method as they

sometimes have Javanese cultural values that need to be preserved. The Pendalungan ethnic group, comprising 8 million people or 20% of East Java's total population, is a distinct Javanese society that has culturally isolated for a long time due to the region's challenging accessibility from the government center in North Java (BPS, 2023).

Geographically, the Pendalungan ethnic group is situated in an area

surrounded by mountainous and hilly terrain, which poses difficulties in accessing facilities and infrastructure, hindering behavioral change processes (Ir et al., no date).

Therefore, this study aimed at investigating the health-seeking behavior of CRC patients in three distinct cultural regions of East Java, which has not been previously explored. The study saught to identify patterns of health-seeking behavior influenced by knowledge and accessibility of treatment and moderated by cultural factors.

Materials and Methods

This study employed a cross-sectional design using structured equation modeling (SEM), with two external variables (Health Accessibility and Self Health Awareness), one internal variable (Health Seeking Behavioral), and one moderation variable (Culture).

Participants

A total of 230 respondents participated in the study, including 86 from the Arek region, 72 from the Mataraman region and 72 in the Pendalungan region. Purposive sampling was used to select participants who were undergoing CRC surgery due to medical indications at hospitals (Ames et al., 2019).

The difference in the number of participants recruited was due to the unequal distribution of the population across regions, with 42% being Arek ethnic group, 37.8% being Mataraman ethnic group, and 20% being Pendalungan ethnic group. To be eligible for the study, respondents must have been diagnosed with colostoral carcinoma and lived in the region for at least 10 years. Exclusion criteria include other cancers and dementia, as well as age over 30 years to eliminate genetic factors.

Health seeking behavioral

There are three indicators of health-seeking behavior. The first indicator (HSB 1)measures the initial goal of seeking treatment through five questions with a score range of 1 to 5. The options are ranked from highest to lowest as follows: surgeons, non-surgical specialists, general practitioners, nurses, and traditional healer. The second indicator (HSB 2) measures the treatment suggestor through five questions with a score range of 1 to 5. The options are ranked from highest to lowest as follows: self-initiated, family, neighbors/friends, health cadres, and community leaders. The third indicator (HSB 3) measures the advice for the first treatment through five questions with a score range of 1 to 5. The options are ranked from highest to lowest as follows: treatment at health facilities, religious alternative medicine, traditional alternative medicine, self-medication, and advice not to seek treatment.

Health Accessibility

Health Accessibility is measured by two indicators, namely insurance ownership and ease of access to the nearest health facility. The insurance ownership indicator consists of three questions, each scored between one and three. The questions assess ownership of National Health Insurance (NHI/BPJS), private insurance, and lack of insurance. The ease of access indicator consists of three questions, scored between one and three, which evaluate the level of difficulty in accessing the nearest health facility (easy, difficult, or very difficult).

Self-Health Awareness (Knowledge)

Self-Health Awareness is evaluated through an assessment that includes 11 questions about CRC symptoms and six questions about risk factors.. Each question has two possible answers: true (scored as 2) or false (scored as 1).The total score ranges from 6 to 24, with higher scores indicating greater knowledge about colorectal cancer among individuals affected by it.

Data collection

Data were collected between August 1 and October 30, 2022, from various sources including Saiful Anwar General Hospital Malang, Iskak General Hospital Tulungagung, DKT Hospital Jember, a group of CRC patients in Surabaya, and private patients from surgeons in Banyuwangi Hospital, Bondowoso Hospital, Bojonegoro

Hospital, Ngawi Hospital, Ponorogo Hospital, and Madiun Hospital. The respondents were interviewed by an enumerator or through communication media after providing informed consent. The interviews lasted approximately 30 minutes.

Data Analysis

The collected data consisted of nominal-ordinal type variables and was analyzed using the structural equation modeling (SEM) method. This statistical method is used to test the relationships between variables and gain a better understanding of their interconnections. Model fit indicators such as chi-square, RMSEA, CFI, and SRMR are used to evaluate the quality of the model (Kenny, 2020).

The SEM testing was conducted using the SmartPLS application without normality testing.. Prerequisite testing included outer weight and collinearity (VIF) testing on formative variables (health accessibility and self-health awareness), followed by outer loading factor testing, average variance extracted (AVE), and composite reliability. Model fit was then assessed using SRMR and NFI (Ringle et al., 2015; Hair et al., 2017) .

The established relationship model had two types of models. The first model showed the overall relationship of the variable set with culture being the midpoint connecting all ethnicities as follows (Figure 1).

And the hypotheses are:

H1 : Health accessibility is positively correlated with Health Seeking Behavioural in East Java Province (Direct Path)

H2: Self Health Awareness is positively correlated with Health Seeking Behavioural in East Java Province (Direct Path)

H3: Culture is positively correlated with Health Seeking Behavioural in East Java Province (Direct Path)

H4: Culture positively moderates Health Accessibility with Health Seeking Behavioural in East Java Province (Indirect Path)

H5 : Culture positively moderates Health Accessibility with Health Seeking Behavioural in East Java Province (Indirect Path)

The second model emphasized more in-depth analysis per ethnicity. Thus, data filters were needed in the second model to divide ethnicities to Arek, Mataraman, and Pendalungan group. In the following, the second model is presented (Figure 2).

And the hypotheses are :

H1 : Health Accessibility is positively correlated with Health Seeking Behavioural in Etnic (Arek/Mataraman/ Pendalungan)

H2: Self Health Awareness is positively correlated with Health Seeking Behavioural in Etnic (Arek/Mataraman/ Pendalungan)

Table 1. Distribution of CRC Patients Across Different Hospitals

Hospital	n	%
Saiful Anwal General Hospital Malang	125	54%
Iskak General Hospital Tulungagung	36	16%
DKT Hospital Jember	36	16%
Other RS	33	14%
Sum	230	100%

Results

Characteristic of the Sample

The CRC patients who participated in this study were hospitalized patients and surgical referral patients from various hospitals in East Java that are designated as surgical referral hospitals.

Table 1 shows the distribution of colorectal patients across different hospitals. The majority of patients (54%) were screened at Saiful Anwal General Hospital, followed by Iskak General Hospital Tulungagung and DKT Hospital Jember with 36 patients each (16%). Other hospitals, including hospitals in Madiun, Ponorogo, Bojonegoro, Situbondo, had only 1-3 patients.

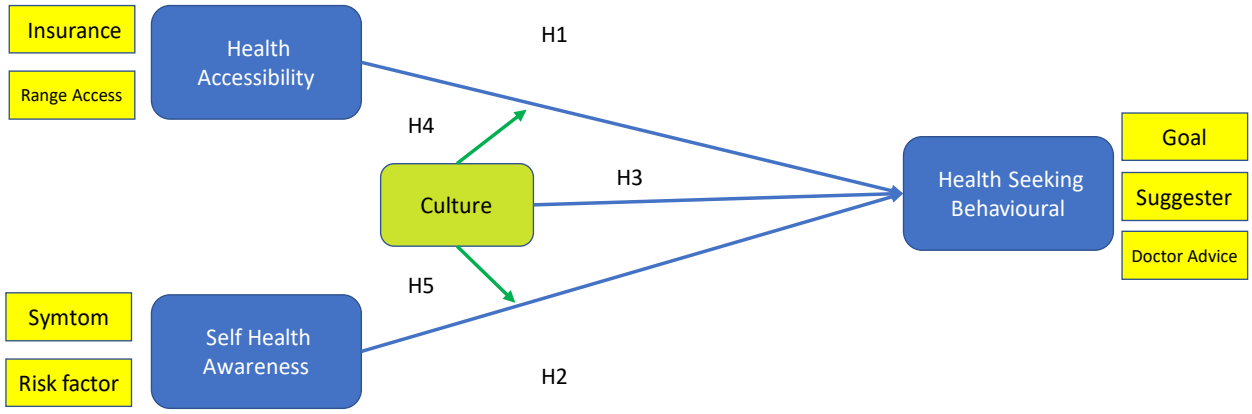

Figure 1. Relationship Models Using SEM with Smart PLS. H1: Health Accessibility positively related with Health Seeking Behavioural in East Java Province; H2: Self Health Awareness positively related with Health Seeking Behavioural in East Java Province; H3: Culture positively related with Health Seeking Behavioural in East Java Province; H4: Culture positively moderated Health Accessibility with Health Seeking Behavioural in East Java Province; H5: Culture positively moderated Health Accessibility with Health Seeking Behavioural in East Java Province

Table 2. Distribution of Colorectal Patient

Age Average	Y.o		
Arek	53.4		
Mataraman	56.5		
Pendalungan	47.9		
Ethnic group	n	%	Deviation Standar
Arek Etnic			
Male	47	55%	0.828393
Female	39	45%	
Total	86	100%	
Mataraman Etnic			
Male	39	54%	
Female	33	46%	
Total	72	100%	
Pendalungan Etnic			
Male	38	53%	
Female	34	47%	
Total	72	100%	
ICD Cancer Location	n	%	
C18.0 Caecum	10	4%	
C18.2 column asending	27	12%	
C18.3.flexura hepatic	1	0%	
C18.4 column tranversum	7	3%	
C18.6 column desending	9	4%	
C18.7 kolon sigmoid	39	17%	
C19 rektosigmoid	41	18%	
C20 rectum	96	42%	
Total	230	100%	
Income	n	%	
≤ $90	113	49%	
$91 - $132	55	24%	
$133 - $219	44	19%	
$220 - $442	18	8%	
Total	230	100%	
Health seeking Behavioural			
The Initial Goal Of Seeking Treatment (HSB1)	n	%	Deviation Standar
Traditional Healer	1	0%	0.953
Nurses	12	5%	
General Practitioners	121	53%	
Non-Surgical Specialists	34	15%	
Surgeons	62	27%	
Total	230	100%	
Treatment Suggestor (HSB2)			
Community Leaders	1	0%	0.643
Health Cadres	4	2%	
Neighbors/Friends	1	0%	
Family	110	48%	
Self-Initiated	114	50%	
Total	230	100%	
Advice of First Treatment (HSB 3)			
Advice Not To Seek Treatment	0	0%	0.403
Self-Medication	4	2%	

Table 2. Continued

Advice of First Treatment (HSB 3)			
Traditional Alternative Medicine	0	0%	
Religious Alternative Medicine	2	1%	
Treatment At Health Facilities	224	97%	
Total	230	100%	
Health Accessibiliy			
Access Range	n	%	Deviation Standar
Very Dificult	16	7%	0.277
Dificult	38	17%	
Easy	176	77%	
Total	230	100%	
Insurance Ownership			
Not Have	4	2%	0.593
Private Insurance	2	1%	
NHI/BPJS	224	97%	
Total	230	100%	
Self Health Awareness			
Symtomp Test Value	n	%	Deviation Standar
11	115	50%	3.797
12	21	9%	
13	11	5%	
14	13	6%	
15	7	3%	
16	9	4%	
17	7	3%	
18	8	3%	
19	5	2%	
20	11	5%	
21	3	1%	
22	20	9%	
Total	230	100%	
Risk Factor Test Value			
6	53	23%	2.084
7	40	17%	
8	26	11%	
9	39	17%	
10	21	9%	
11	19	8%	
12	32	14%	
Total	230	100%	

Table 2 presents the distribution of colorectal patients based on ethnicity, age, and ICD code. The Arek ethnic group had the highest number of patients (86), followed by Mataraman and Pendalungan with 72 patients each. The highest average age was found in the Mataraman ethnic group at 56,5 years old, while the lowest was in Pandalungan at 47,9 years old, with Arek coming in second with an average age of 53,4 years old and a standard deviation of 0.828.

The average number of CRC patients with

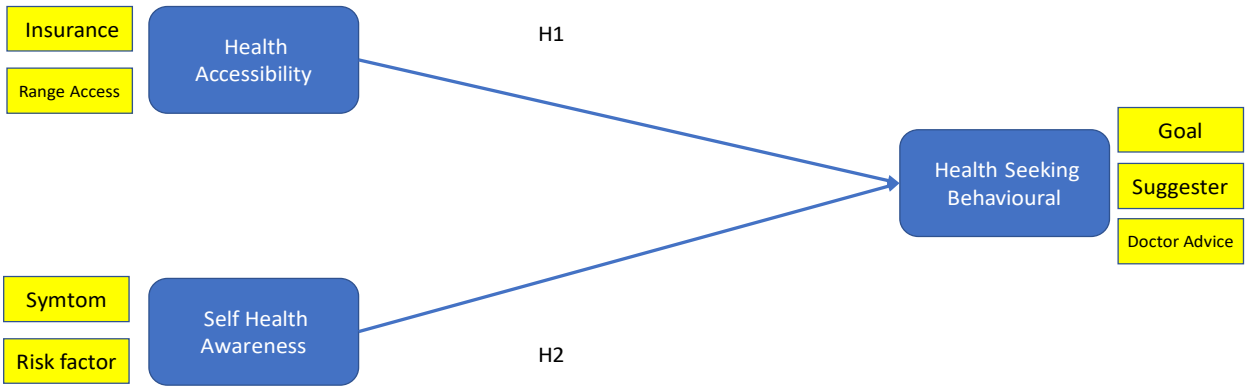

Figure 2. Second Model of Relationships Using SEM with Smart PLS. H1: Health Accessibility positively related with Health Seeking Behavioural in Etnic (Arek/Mataraman/Pendalungan); H2: Self Health Awareness positively related with Health Seeking Behavioural in Etnic (Arek/Mataraman/Pendalungan)

Table 3. Results of the Prerequisite Test for the Formative and Reflective Variables

Variable	Type Varible	Outer Weight	VIF	Outer Loading	AVE	Composite Realiability	Conclussion
Access	Formatif	0.9975	1.0006				qualify
Insurance	Formatif	0.0502	1.0006				unqualify
Symtomp	Formatif	0.5937	1.6299				qualify
Risk Factor	Formatif	0.5162	1.6299				qualify
Self Health Awareness * Culture	Moderating Formative	10	1				qualify
Health Accessibilty * Culture	Moderating Formative	10	1				qualify
Health Seeking Behavioral 1	Reflective			0.49	0.3239	0.4119	unqualify
Health Seeking Behavioral 2	Reflective			0.839			qualify
Health Seeking Behavioral 3	Reflective			-0.16			unqualify

ICD C20-rectum was 96 people/patient, accounting for 42% of all cases. The lowest number was found in the type of ICD C18 flexura hepatic, with only one patient or a proportion of 0.004.

Furthermore, low-income individuals (≤ $90,00) accounted for the highest percentage (49%) among those who underwent screening,, while high-income individuals (between $220,00 and $442,00) accounted for only 8% of the total sample size.The data presented in Table 2 provides information on the initial goal of seeking treatment (HSB 1), treatment suggestions (HSB 2), and first treatment advice (HSB 3). The table consists of five types of treatment sought, namely traditional healers, nurses, general practitioners, non-surgical specialists, and surgeons. In HSB 1, the results showed that general practitioners were the most commonly sought-after initial treatment goal with a percentage of 53%, followed by surgeons at 27%, non-surgical specialists at 15%, nurses at 5%, and traditional healers with a percentage of 0%. The overall standard deviation was found to be 0,952. In HSB 2, the results indicated that self-initiated treatment was the most suggested with a percentage of 50%, followed by family at 48%, health cadres at 2%, neighbors/friends at 0%, and community leaders with a percentage of 0%. The standard deviation for this aspect was 0.643. Furthermore, HSB3 showed that first treatment advice mostly came from health facilities with a percentage of 97%, followed by self-medication at 2%, religious alternative medicine

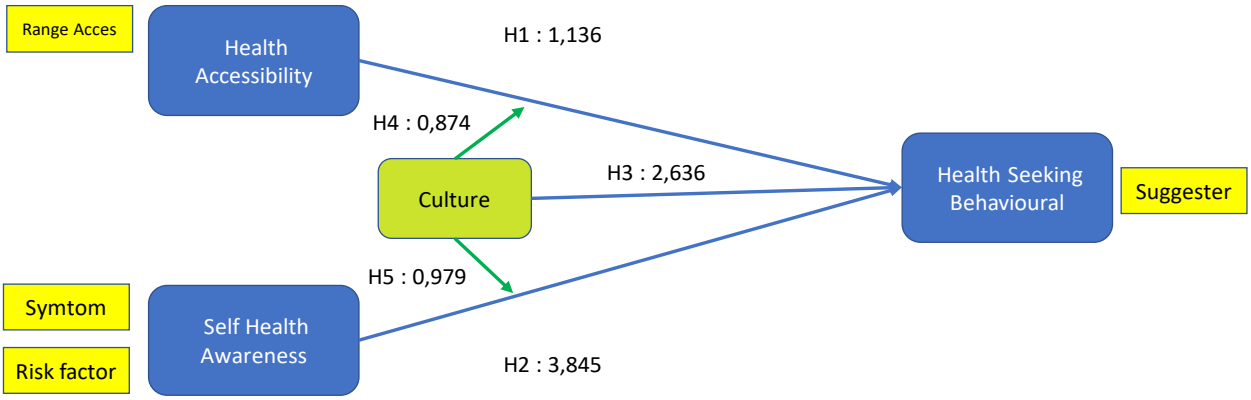

Figure 3. Structural Model Using SEM With Smart PLS in East Java Province

Table 4. Second Results of the Prerequisite Test for the Formative and Reflective Variables

Variable	Type Varible	Outer Weight	VIF	Outer Loading	AVE	Composite Realiability	Conclussion
Access	Formatif	1	1				qualify
Simtomp	Formatif	0.5725	1.6299				qualify
Risk Factor	Formatif	0.5379	1.6299				qualify
Self Health Awareness * Culture	Moderating Formative	10	1				qualify
Health Accessibilty * Culture	Moderating Formative	10	1				qualify
HSB 2	Reflective			10	10	10	qualify

Table 5. Model Fit Analysis

Model Fit Test	Saturated Model	Estimated Model
SRMR	0.0204	0.0204
NFI	0.9735	0.9735

at 1%, and advice not to seek treatment at all with a percentage of 0%. The standard deviation for this aspect was 0.402.

The data also includes information on two indicators related to health accessibility: access range and insurance ownership. The first aspect, access range, was presented in terms of the level of difficulty in accessing healthcare. Out of the total sample size of 230, it was found that accessing healthcare was easy for the majority (77%) or 176 individuals. However, a total of 38 individuals or 17% reported difficulty in accessing healthcare,, while 16 individuals or 7% found it very difficult. The standard deviation for this dataset was 0.277, indicating a relatively consistent response pattern. The second aspect, insurance ownership, was presented in terms of the type of insurance held by the respondents. The data showed that the majority of individuals (97%) had National Health Insurance (NHI) or BPJS insurance, while only two individuals (1%) had private insurance and four individuals (2%) had no insurance coverage. The standard deviation for this dataset was 0.594, indicating greater variability compared to the first aspect of health accessibility.

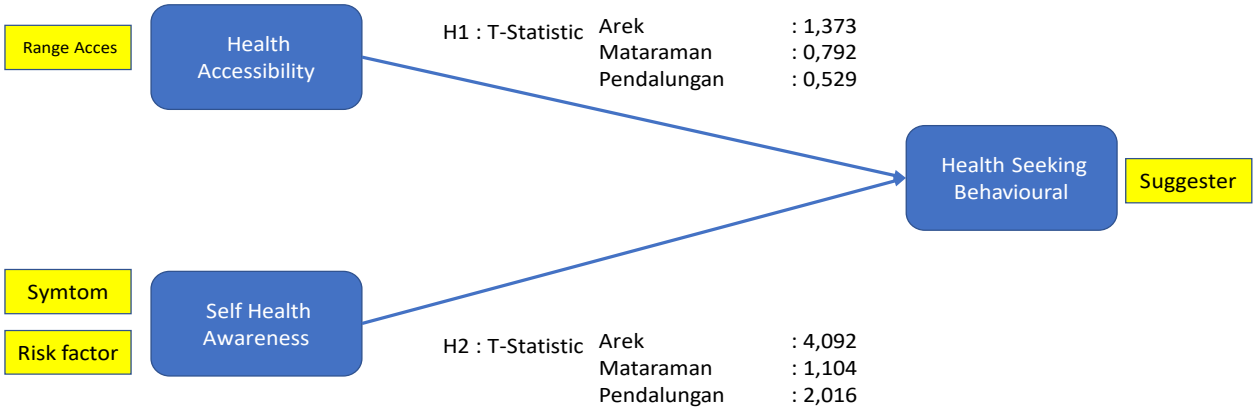

Figure 4. Structural Model Using SEM With Smart PLS Etnic of Arek, Mataraman and Pendalungan

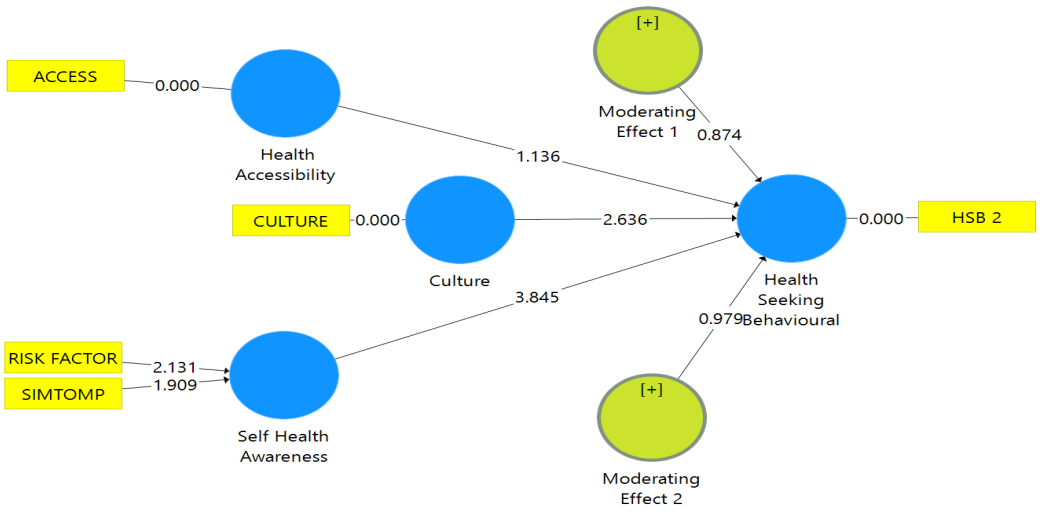

Figure 5. Original Figure Output of Health Seeking Behavioural on East Java Province

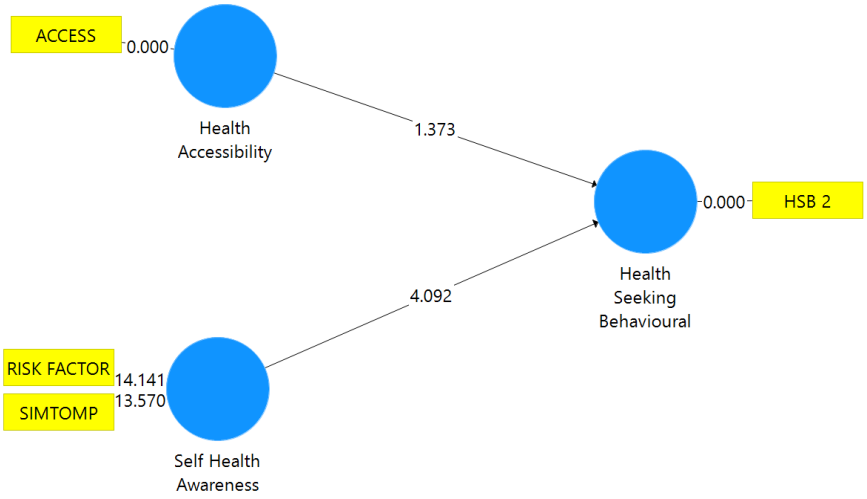

Figure 6. Original Figure Output of Health Seeking Behavioural on Etnic Arek

Table 6. Results of Main Analysis Models

Path	Type Path	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P-Values
Health Accessibility -> Health Seeking Behavioural	Direct Path	0.064	0.056	1.136	0.257
Culture -> Health Seeking Behavioural	Direct Path	0.135	0.051	2.636	0.009
Self Health Awareness -> Health Seeking Behavioural	Direct Path	0.216	0.056	3.845	0
Moderating Effect 1 -> Health Seeking Behavioural	Indirect Path	0.047	0.053	0.874	0.382
Moderating Effect 2 -> Health Seeking Behavioural	Indirect Path	0.049	0.05	0.979	0.328

The data on self-health awareness also revealed a relatively low level of awareness among patients regarding natural signs and symptoms before being diagnosed with CRC. Specifically, symptom test 11 had the highest number of patients who were unaware with 115 patients or more than 50%. The lowest value was observed in the total test 21 with only 10%. Furthermore, symptom test 11 had the lowest values with only 19 patients or 8%, followed by symptom test 12 with 32 patients (14%). This dataset had a standard deviation of 3.797.

Main Result

The results of the prerequisite test table for both formative and reflective variables (Table 6) showed that the outer weight values for each variable met the required criteria, with standard values exceeding 0.5, except for the insurance variable which only reached 0.0502. The accessibility variable had the highest value with a score of 0.9975. Furthermore, the VIF collinearity test showed that all formative variables had VIF values below 5, with the symptom variable having the highest value of 1.6 and the moderation variable having the lowest value of 1 (Table 3).

In this study, health-seeking behavior was considered as a reflective variable consisting of three indicators: initial goal of treatment (HSB 1), treatment suggester (HSB 2), and advice on the first treatment (HSB 3). However, only one indicator, treatment suggester (HSB 2), met the loading factor criteria with a loading value exceeding 0.7

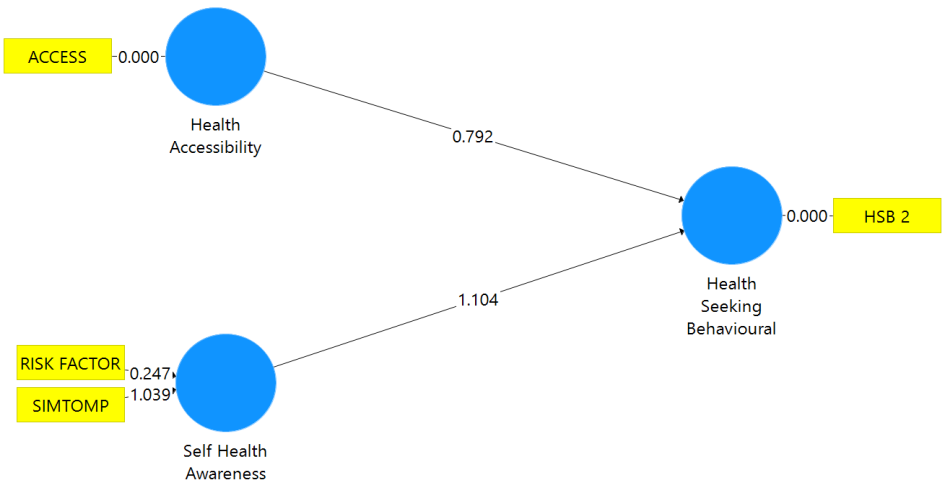

Figure 7. Original Figure Output of Health Seeking Behavioural on Etnic Mataraman

Table 7. Results of Path Analysis of Structural Models in Etnic of Arek, Mataraman and Pendalungan

Path	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P-Values	Sig < 0.05
Arek Studies					
Health Accessibility -> Health Seeking Behavioural	0.143	0.11	1.373	0.194	Unsignificant
Self Health Awareness -> Health Seeking Behavioural	0.374	0.089	4.19	0	Significant
Mataraman Studies					
Health Accessibility -> Health Seeking Behavioural	0.087	0.109	0.792	0.429	Unsignificant
Self Health Awareness -> Health Seeking Behavioural	0.12	0.109	1.104	0.27	Unsignificant
Pendalungan Studies					
Health Accessibility -> Health Seeking Behavioural	0.051	0.096	0.529	0.597	Unsignificant
Self Health Awareness -> Health Seeking Behavioural	0.215	0.107	2.016	0.044	Significant

at 0.839. Nevertheless, both AVE value and composite reliability values were below their respective thresholds at 0.3239 and 0.4119 respectively, indicating an "unqualified" interpretation.

As a result, three variables were excluded from this study as they did not meet the prerequisite test criteria. The insurance variable was insignificant due to most patients having NHI/BPJS insurance while only a few had private insurance or no insurance at all.. Similarly, most patients consulted doctors or specialists for their initial goal of treatment (HSB1) and were advised to go to health facilities for their first treatment (HSB3). The results of the second prerequisite test are presented in the Table 4.

The present study obtained a model fit of 0.0204 on the SRMR fit test, indicating that the model is considered good as it fell below the threshold of 0.08. Furthermore, the NFI test revealed that the model was very good with a value of 0.9735 , exceeding the minimum threshold of 0.95 (Table 5).

The primary analysis of the relationship model revealed that the path with the highest significance value was observed in in Self Health Awareness -> Health Seeking Behavioural with a T statistic value of 3.845 and a P-Value of 0.000. The second significant path was Culture -> Health Seeking Behavior with a T statistic value of 2.636 and a P-value of 0.009. Conversely, the path relationship with the lowest value was indicated in Indirect path of Moderating Effect 1 (culture moderation of health accessibility) -> Health Seeking Behavioral path with a T statistic of 0.046 and a P-Value of 0.964 (Table 6).

More clearly can suit to the following models (Figure 3).

Ethnicity Analysis

Arek Studies

In Arek studies, Self-Health Awareness -> Health Seeking Behavioural path model showed significant results with a significance level of 4.190 or a P-Value of 0.000, while Health Accessibility -> Health Seeking Behavioral path model was insignificant with T Statistic 1.300 and a P-Value 0.194 (Table 7).

Mataraman Studies

In Mataraman studies, there was no significant path model as both Health Accessibility -> Health Seeking Behavioral path model and Self-Health Awareness -> Health Seeking Behavioural path model was insignificant with T statistic values of 0.792 (P-Value = 0.429) and 1.104 (P-Value = 0.270), respectively (Figure 4).

Pendalungan Studies

In Pendalungan studies, the most significant path model was the Self-Health Awareness -> Health Seeking Behavioral path with a statistical T of 2.016 and a P-Value of 0.044. On the other hand, the Health Accessibility -> Health Seeking Behavioral path was insignificant, with a T statistic of only 0.529 and a P-Value of 0.597.

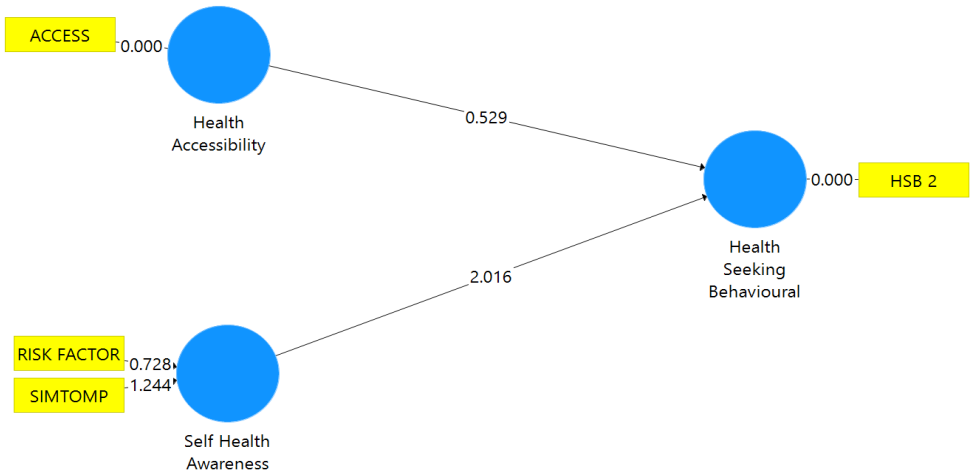

Figure 8. Original Figure Output of Health Seeking Behavioural on Etnic Pendalungan

Discussion

Health Seeking Behavior of CRC Patients in East Java In CRC patients, data shows that culture is closely related to behavioral health seeking in community groups (Figure 5). Various factors affect health seeking behaviors in different contexts, including physical, socio-economic, cultural, and political factors (Adhikari and Rijal, 2014). In this analysis, the P-Values for the direct path between culture and health seeking behavior was 0.009, suggesting a statistically significant relationship. Similarly, the P-Values for the direct path between self-health awareness and health seeking behavior was 0.000, indicating a very strong and statistically significant relationship. However, the P-Values for the direct path between health accessibility and health seeking behavior was 0.257, suggesting that the relationship was not statistically significant.

The moderating effects or indirect pathway columns had P-Values of 0.382 and 0.328, respectively. These results suggested that the moderating effects did not have a statistically significant impact on the relationship between health accessibility, self-health awareness, and health seeking behavior. Overall, these findings provided important insights into the factors influencing health seeking behavior and can inform strategies to improve healthcare outcomes.

According to Hong et al., (2000), culture profoundly influences individuals' attitudes, beliefs, and behaviors. Cultural influences are established at an early age before cognitive filtering abilities fully develop (Shahaeian et al., 2014). Therefore, understanding cultural values' influence is crucial to comprehend patterns and preferences of CRC patients as emphasized by Alden et al., (2014).

The study conducted by Alden et al. (2015) examined the relationship between health information seeking behavior and health accessibility in Japan and the United States. The results indicated that there was a significant relationship between self-health awareness and health-seeking behavior, with a P-Value of 0.001. However, the decision to obtain services was not significant, with a P-Value of 0.370 (Alden et al., 2015).

The hypotheses tested in the study included five hypotheses, of which two were significant (H2 and H3) and three were non-significant (H1, H4, and H5). H1 stated that health accessibility is positively related to health-seeking behaviour in East Java Province. However, the P-Value of 0.257 > 0.05 indicated that there was no significant relationship between health accessibility and health-seeking behaviour in East Java Province.

H2 stated that self-health awareness is positively related to health-seeking behaviour in East Java Province. This hypothesis was significant with a P-Value of 0.000 < 0.05, indicating that individuals with higher self-awareness of their own health are more likely to seek healthcare. H3stated that culture is positively related to health-seeking behaviour in East Java Province. This hypothesis was also significant with a p-value of 0.009, indicating that individuals who are strongly influenced by their culture are more likely to engage in health-seeking behaviour .

H4 and H5 tested the moderation pathway where culture moderates the relationship between health accessibility, self-health awareness, and health-seeking behaviour indirectly. However, both hypotheses were non-significant with p-values of 0.382 and 0.328 respectively, indicating that there is no significant influence of culture as a moderator on the relationship between health accessibility and health-seeking behaviour in East Java Province. Overall, this study highlights the importance of self-health awareness and cultural influences on healthcare seeking behaviours in different regions around the world.

Ethnicity Analysis

The model consists of three studies: Arek, Mataraman, and Pendalungan. In the Arek study,, the path from Self-Health Awareness to Health Seeking Behavioural was significant ($p < 0.001$), indicating that individuals with higher awareness of their own health are more likely to seek healthcare (Figure 6). However, the path from Health Accessibility to Health Seeking Behavioural was not significant ($p = 0.194$), suggesting that there was no significant relationship between health accessibility and healthcare-seeking behaviour .

In the Mataraman study, both paths were not significant ($p = 0.429$ and $p = 0.270$, respectively), indicating that neither Health Accessibility nor Self Health Awareness significantly influenced healthcare-seeking behaviour in this population (Figure 7).

In the Pendalungan study, the path from Self-Health Awareness to Health Seeking Behavioural was significant ($p = 0.044$), indicating that self-awareness of one's own health was positively related to healthcare-seeking behaviour. However, the path from Health Accessibility to Health Seeking Behavioural was not significant ($p = 0.597$), indicating no significant relationship between these variables (Figure 8).

Overall, these results suggest that self- health awareness plays a significant role in predicting health seeking behavioural across all three studies, while having little or no effect on healthcare accessibility.

Arek Studies

In the Arek ethnic group, access to health facilities was considered a crucial factor, although its significance may not be pronounced.. The region inhabited by this group can be regarded as the most developed area in East Java Province. The T-Statistical value for the Arek ethnic group is 1.373, which is the highest among the three other ethnic groups and significantly higher, indicating that health accessibility in the Arek ethnic region is much better and appropriate. The insignificance of the data may be due to only three individuals reporting extremely difficult access and nine reporting difficult access out of the total data available. However, , it should be noted that the self-health awareness variable has an impact on the Arek ethnicity. It can be inferred that self-health awareness among this group is very high and influences health-seeking behavior in CRC with a T-Statistical value of 4.190 and a P-Value of 0.000.

Mahmudiono and Laksono (2021) have suggested that the disparities in hospital services utilization between regions can be attributed to a combination of factors such

as inadequate access to emergency obstetric services, high rates of caesarean section without medical indications among the affluent subgroups, racial differences, and economic factors. In terms of healthcare accessibility, the western regions of Indonesia, including East Java province, have good access to healthcare facilities and health insurance. he Ethnic Arek region in Surabaya has shown that 94% of the West Surabaya area has been covered by healthcare services, with 108.31 km2 out of 115.23 km^2 located within the healthcare service area (Nurwatik et al., 2022). However, there are still areas within this region that lack healthcare services.

Dewi (2019) found that older age, higher education levels, and a family history of cancer were all positively correlated with performing breast self-examination (BSE), indicating a good level of self-health awareness in the Surabaya community. On the other hand, Pujiningtyas discovered that better self-health awareness did not always predict better health behavior among high school students in Surabaya, particularly regarding health literacy status (Prihanto et al., 2021).

In a COVID-19 case study conducted among the Arek ethnic group, Apriliyanti et al. (2021) observed that policy changes implemented by the government influenced other policies and change behavior among this group. However, these policies may face resistance due to entrenched habits and beliefs despite knowledge about their negative impacts (Apriliyanti et al., 2021). Overall, these studies highlight the complex interplay between various factors influencing healthcare utilization and behavior among different populations in Indonesia.

The behavior change process can be empowered through a Top-Down approach, whereby strategic policies are established by community stakeholders, enabling the community structure below to follow suit with either a sense of relief or lack of pleasure [(Apriliyanti et al., 2021).

Mataraman Studies

Within the Mataraman ethnic group, there is a lack of influence of health accessibility and self-health awareness towards health-seeking behavior. Data examination revealed a very small difference between non-significant paths, and two non-significant variables had contrasting values that may be included in a significant area.

Although the Mataraman ethnic group had good health-seeking behavior and was influenced by better health accessibility compared to the Pendalungan ethnic group, this difference was not significant. It can be said that self-health awareness had a stronger relationship compared to health accessibility, with a T-Statistic reaching 0.792 or a P-value reaching 0.429, both of which were not significant. However, compared to the Pendalungan ethnic group, the health accessibility of the Mataraman ethnic community was slightly better.

The Mataraman ethnic group is the largest in East Java with the widest number of districts/cities. Individuals who are highly educated and work in primary and secondary sectors have a higher chance of becoming poor compared to those who work in tertiary sector in the Mataraman area (Ristanto et al., 2022). These results align with Borko's (2017) research indicating that activities in the agricultural sector had a greater chance of leading to poverty.

The dominance of the impoverished agrarian group may be a significant factor contributing to low levels of self-awareness regarding health. This is evidenced by the majority of symptom values being below or equal to 17, and the most frequent risk factor values being below or equal to 9, with a percentage >50%. Additionally, the level of education in this group remained low.

However, Pramono, Wulansari, and Sutikno (2012) suggest that the Mataraman ethnic group is more receptive to a Bottom-Up approach due to their adherence to Javanese cultural norms.Pendalungan Studies

In contrast, the Pendalungan ethnic group exhibited a greater level of self-awareness regarding health-seeking behaviour in CRC patients. This is supported by a T-Statistic for health awareness being 2.016 with a P-value of 0.044. Although their access to healthcare remained lower compared to the Mataraman ethnic group, this may be attributed to the high interest in obtaining health literacy through various sources such as TV (46.3%), radio (32.8%), and the internet (57.4%). In addition, public universities in the East Java province may contribute to their heightened awareness compared to the Arek population (Nurdiansyah et al., 2022).

However, it is important to note that the Pendalungan ethnic area is located far from the provincial capital and has more rural areas compared to urban areas. In Wulandari et al., (2019) found that elderly individuals residing in urban areas had better hospital utilization compared to those living in rural areas. The elderly in urban areas are 1,544 times more likely to use hospitals than those living in rural areas. Further studies are needed to determine whether socio-economic and cultural factors make the Pendalungan ethnic group vulnerable . If so, it is crucial for government intervention aimed at protecting public health within this region.

In conclusion, this study aimed at examining the health-seeking behavior of CRC patients in East Java, Indonesia, with a focus on the influence of culture, self-health awareness, and healthcare access. The findings indicated that culture and self-health awareness had a significant impact on health-seeking behavior, while healthcare access did not. Cultural values that are ingrained from childhood shape individual attitudes, beliefs, and behaviors, resulting in distinct ethnic tendencies. Therefore, understanding cultural values is crucial to comprehending the patterns and preferences of CRC patients.

The study highlighted that the, the more likely they are to seek healthcare. greater the influence of culture on individuals, the more likely they are to seek healthcare.

Additionally, the study found that self-health awareness had a strong positive correlation with health-seeking behavior. Individuals who posed higher levels of self-health awareness were more likely to seek healthcare. This indicates that promoting self-health awareness among the population can lead to an increase

in health-seeking behavior.

The study also investigated the impact of healthcare access on health-seeking behavior. The results indicated that healthcare access did not have a significant impact on health-seeking behavior, possibly due to the significant development in the East Java province.

Moreover, the study analyzed the health-seeking behavior of CRC patients from different ethnic groups in the East Java province, Indonesia. The findings demonstrated that self-health awareness played a significant role in predicting health-seeking behavior across all three studies, while healthcare access had little or no significant influence.

Author Contribution Statement

A.B. and S.A. conceptualization; A.B. data curation; T.H. and N.M formal analysis; A.B. and T.H. investigation; A.B., S.A. and T.H. methodology; A.B. and N.M writing-original draft; A.B., S.A., T.H and N.M writing-review and editing; N.M. and S.A. resources; N.M. project administration; S.A. supervision..

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Approval

We confirm that the research proposal submitted by the author had been presented and approved for continuation by the Faculty Council of the Faculty of Medicine at Universitas Brawijaya on May 22nd, 2022.

Ethical Declaration

All procedures performed in studies involving human participants were conducted in accordance with the ethical standards of the Health Research Ethics Committee of dr. Saiful Anwar General Hospital in Malang, which aims to protect human rights and ensure the well-being of medical research subjects.

Data Availability

Data is available upon reasonable request.

Conflict of Interest

No conflicts of interest to report.

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