

# Statistical Modelling of Awareness on Risk Factors of Gastric Cancer : A Study on Youngsters in Melaka

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## ARTICLE HISTORY

## ABSTRACT

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*In Malaysia, gastric cancer (also known as stomach cancer) is diagnosed at a complex stage and has poor prognosis. Most mortality cases due to gastric cancer diseases are potentially preventable. Thus greater efforts are needed for gastric cancer awareness to give adequate knowledge for Malaysians in order to be more cautious or alert in diagnosing the ailment much earlier. After all, early detection is the key towards improving the survival rate in gastric cancer patients. Hence, the aim of this study is to assess the youngsters' awareness on the risk factors of gastric cancer. A survey using online forms was conducted on 350 students of UiTM Melaka, Alor Gajah Campus, to assess their awareness of risk factors regarding gastric cancer. Based on the regression analysis conducted, it can be highlighted that attitudes, knowledge, medication, education level and faculty (dummy) are some of the variables that were found to be the risk factors of the awareness on gastric cancer among these selected youngsters in the 21<sup>st</sup> century.*

**Keywords:** *gastric cancer; awereness; risk factors*

## 1. INTRODUCTIONS

As an indispensable part amongst the most crucial organs in our body other than our heart and brain, our stomach is also not excepted from being affected by any diseases. Any medical problems that are connected with stomach will hence influence our digestive systems [1,2]. Typically, every human body will produce another cell that will supplant the old cells. Notwithstanding, at times, the procedures of cell development are unusual and unneeded new cells structure in human body, will at that point build up another undesirable mass tissue called a lump, growth, or tumor [3]. Stomach cancer which otherwise is called gastric cancer is triggered when cells in the stomach lining start to develop uncontrollably [4]. The cancer may grow from the stomach to different pieces of the body, for the most part in our lungs, liver, bones, abdomens and lymph nodes. When the cancerous cells start to affect different pieces of the body and begin harming different tissues and organs, patients are said to be in a cutting edge phase of gastric cancer [5]. There are a few kinds of the gastric cancers which are known as Adenocarcinoma, Lymphoma, Gastrointestinal stromal tumor (GIST), Carcinoid tumor, Squamous cell carcinoma, small cell carcinoma and leiomyosarcoma.

According to recent studies, stomach cancer is found to be as one of the most widely recognized cancers or malignancies among individuals around the world. Despite the fact that the rate of patients determined to have this disease is declining every year for specific parts of the world, it keeps on showing a noteworthy clinical challenge because most cases are being recognized

in complex stages with poor situations and constrained treatment alternatives [6]. Contrasted with other nations, Japan and Korea have the most elevated danger of having gastric cancer [7].

In Malaysia, the statistics show that hundreds of citizens are suffering from this gastric cancer each year which has also led to fatal cases [8]. It is the 6th mainstream cancer among males and the tenth prominent disease among females in Malaysia [9]. Past studies found that gastric cancer is one of the main factors of death among patients with malignancies [10].

### ***1.1 Youngsters***

Youngsters are characterized as people ranging from 10 to 24 years of age. The United Nation, for factual purposes, however decreases the scope of youngsters, to those between the ages of 15 and 24 years [11]. Gastric happens regularly in the age between 50–70 years [12,13,14]. Be that as it may, more than past 50 years, various research have passed on the medicinal and compulsive characteristics of gastric cancer in youngsters in the scope of 2%–8% in various arrangements [15]. Gastric cancer's mindfulness mediations focusing on each youngsters from parts of Malaysia are fundamental in light of the fact that there is a recent pattern of analysis of this cancer among youngsters in the country [16,17].

### ***1.2 Gender***

Gender is known to be one of the hazard factors that is accounted for to expand the danger of gastric cancer [18,19]. Prior research demonstrated that the onset of the gastric cancer might be connected with some clinicopathological qualities. Females are progressively more frequent among more young patients; where the female to male proportion is 2:1, and diffused and undifferentiated histologic sorts are more as often as possible analyzed in younger patients than in senior citizens (in whom the intestinal kind is increasingly more common) [20, 21, 22]. In addition, youngsters are normally present with this disease at a further developed stage.

### ***1.3 Awareness***

Albeit most of the contributing factors of gastric cancer are identified with food intake and way of life, public mindfulness towards the disease itself may likewise be the reason that the individual has a higher likelihood in getting the disease. The facts confirm that lifestyle and food intake influence stomach the most, however without the awareness, the counteractive action will never prevail at the primary spot. To decrease gastric cancer's mortality, reversible hazard components ought to be adjusted and regular screening ought to be performed [23]. To accomplish this objective, educating the public ought to be embraced as a high state of public's consciousness of those contributing factors is required. There are research on the contrasts between the cancer risk perceptions by the all inclusive community and their conduct towards the counteractive action of the disease [24, 25, 26]. In this manner, it is critical to decide current dimensions of risk factor awareness and perceptions of screening projects proposed for the overall public.

#### ***1.4 Risk Factors***

There are a plenty of factors that can be considered as risk factors that may activate gastric cancer including smoking, tainted by the *H. pylori* microorganisms, and certain hereditary conditions. The most widely recognized reason is contamination by the bacterium *Helicobacter pylori*, which has been recorded in 60% of cases [27]. Starting signs incorporate acid reflux or heartburn, upper abdominal pain, nausea, loss of appetite, difficulty in swallowing, and blood in the stool. Usually, a diagnosis is directed by doing biopsy during endoscopy, trailed by medical imaging and medicines which may contain a blend of medical procedures, chemotherapy, radiation treatment, and targeted therapy.

#### ***1.5 Attitudes/Lifestyle***

Researchers have affirmed that nutritional factors have for quite some time been the most compelling variables that lead to gastric cancer particularly are preserved food and low intake of fruits. Dietary factor plainly expresses that high admission of salts, meats and processed meat will boost up the risk of developing the cancer [28]. Be that as it may, with sound eating routine and sufficient intake of fruits, the risk of an individual to have the disease will be lower than the people with an undesirable diet [29]. Other than that, dietary factors likewise may clarify the disparity in the risk of stomach cancer in every person. The agent that commonly affects gastric cancer patients is called *Helicobacter Pylori* which goes about as the substance that can cause malignant growth in living tissues. To exacerbate the condition, individuals who smoke will have a high danger of gastric cancer as research found that each 6th case of gastric cancer is brought about by patients smoking cigarettes [30].

#### ***1.6 Knowledge***

Gastric cancer has an extremely high plausibility of treatment rate on the off chance that it is seen and treated early. Unfortunately, patients ordinarily came in late because of its unobtrusive side effects. It will be hard to fix gastric cancer once it has spread to different organs of the patients' body. The degree of endurance of gastric cancer patients is exceptionally reliant on the stage at which analysis is made and a few past research have reported this to be certain [31]. Primary diagnosis is an indispensable factor in influencing the result of surgical treatment. Most youngsters have insignificant or are lacking of learning of the risk factors, symptoms and strategies for early detection of gastric cancer, prompting towards the appearance and future inclination of deaths as gastric cancer is inevitable without early detection and no ideal access to treatment is carried out [32]. In addition, having sufficient information of gastric cancer enables youngsters and urges them to partake in prevention and screening projects identified with this deadly illness.

#### ***1.7 Medication***

Next, in medical world, research found that pernicious anemia will always correspond to gastric cancer as patients with pernicious anemia have lower immunity, dietary lack, intestinal bacterial development and terminal ileum pathology. Patients with pernicious anemia will undoubtedly have the triple times higher tendency to be determined as having gastric cancer [33]. Essentially, individuals that experience the ill effects of pernicious anemia have low vitamin 12 ingestion and numerous different elements that are connected with one another organically. Notwithstanding, dose dependent intakes of non-steroidal anti-inflammatory drugs such as

aspirin will help in preventing this cancer. Other than that, they experience cancer fatalism, trust the alternative of traditional treatments and have the absence of self-rule in decision making in looking for or shirking of scientific-based prescriptions.

The main purpose of this research is to evaluate on the youngsters' mindfulness on the risk factors that trigger the gastric cancer where we were attempting to educate individuals at the beginning period so as to increase the gastric cancer's survival rate. This study likewise aims to ascertain the connection between risk factors (attitude/lifestyles, knowledge and medication) with mindfulness on gastric cancer among youngsters.

Based on figure below, this study proposed the following hypotheses based on the above past studies:

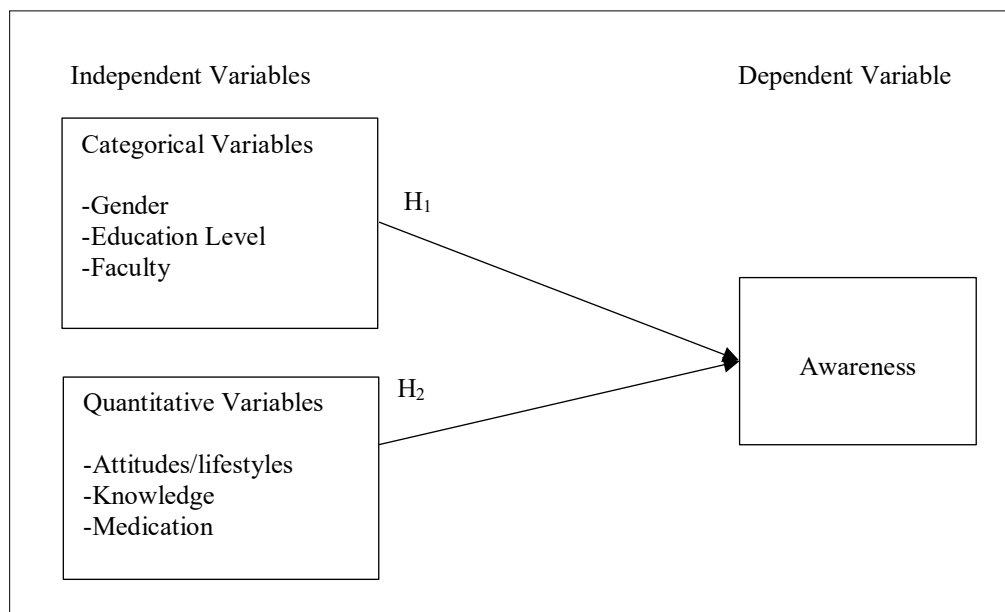


Figure 1: Proposed Research Model

H<sub>1</sub>: There is a relationship between gender, education level and the faculty of the respondents towards awareness of gastric cancer among youngsters.

H<sub>2</sub>: There is a relationship between attitudes/lifestyles, knowledge and medication of respondents towards awareness of gastric cancer among youngsters.

## 2. METHODOLOGY

### 2.1 Data Collection

A survey form was used and distributed via the online platform during the July - December 2018 semester at Universiti Teknologi Mara (UiTM) Melaka, Alor Gajah Campus. Since the population of diploma and degree students in this campus is 4876 students, Sekaran [34] proposes that the samples comprising of 350 students ought to be taken. The data were then examined utilizing the IBM SPSS Statistics 22 (SPSS 22) so as to acquire the outcomes and

present the discoveries in accordance with the objectives of the investigation. In this research, stratified sampling was utilized where all respondents were separated into their respective faculties (strata) namely the Faculty of Communication and Media Studies, Faculty of Art and Design, Faculty of Hotel and Tourism, Faculty of Education and Faculty of Business and Management. The number of respondents selected in every faculty was proportionate to the overall number of respondents in the faculty which is 4876; hence the appropriate proportion used is 7.2% from each faculty.

### **2.1 Data Analysis**

The descriptive statistics explain the respondents in terms of frequency and percentage of the responses collected. Then, two inferential analyses were carried out namely, Pearson's Correlation and Multiple Linear Regression (MLR). The bivariate analyses analyzes the relationship between the awareness of gastric cancer among teenagers and independent variables which were attitudes/lifestyles, knowledge and medication. MLR has been used to determine the best predictor in explaining dependent variable. The procedures involved the F-test, coefficient of determination, and test on regression coefficients.

The survey instrument was developed into four major sections of their awareness and some items on the demographic data. Section A contained three questions using nominal scale focused on respondents' background. Section B focused on determining the attitudes/lifestyles (5 items), while Section C was concerned with the knowledge of respondents (5 items), and Section D examined the medication part (5 items). Section E required the respondents to rate statements about the awareness of gastric cancer among teenagers (5 items). The pilot study was initially conducted to verify reliability and validity of the item used.

## **3. RESULTS AND DISCUSSION**

### **3.1 Demographic Profile of Respondents**

Table 1 shows the demographic profile of the respondents. It shows that there were 246 female respondents (70.3%) compared to 29.7% (104 respondents) male respondents. In terms of education level, 66.3% (232 respondents) of the respondents were diploma students while 33.7% (118 respondents) were bachelor degree students. It was revealed that half of the total respondents were from the Faculty of Business and Management by 52.6% (184 respondents), followed by the Faculty of Communication and Media Studies 20.6% (72 respondents) and the Faculty of Art and Design by 11.4% (40 respondents). The rest of the respondents were from the Faculty of Accounting, Faculty of Hotel and Tourism Management and Faculty of Education with 7.1% (25 respondents), 4.6% (16 respondents) and 3.7% (10 respondents) respectively.

Table 1: Respondents' Background

Background	Items	Frequency	Percentage (%)
Gender	Male	246	70.3
	Female	104	29.7
Education Level	Diploma	232	66.3
	Degree	118	33.7
Faculty	Education	13	3.7
	Communication and Media Studies	72	20.6
	Business and Management	184	52.6
	Art and Design	40	11.4
	Accounting	25	7.1
	Hotel and Tourism Management	16	4.6

### 3.2 Reliability Analysis

Cronbach's Alpha was used to evaluate the reliability of the questionnaire and the result is shown in the Table 2. The Cronbach's Alpha coefficients for the component of awareness, attitude/lifestyles, knowledge and medication were 0.756, 0.871, 0.929 and 0.828 respectively. It was found that all the Cronbach's Alpha values were more than 0.70, demonstrating that the questionnaire was reliable. It indicated that those particular components extracted had a reliable measure of consistency awareness among the 350 respondents.

Table 2: Results of Reliability Test

Attribute	Cronbach's Alpha
Awareness	0.756
Attitudes/Lifestyles	0.871
Knowledge	0.929
Medication	0.828

### 3.3 Multiple Linear Regression Analysis

In order to ensure the appropriateness of the outputs from the regression analysis, the assumptions of multiple regressions must comply. For normality of error terms assumption, simple P-P plot can be used. If positive linear line is observed, then the error terms is normally distributed. To check if the error terms are of constant variance, a scatter plot of residuals versus predicted values can be plotted.

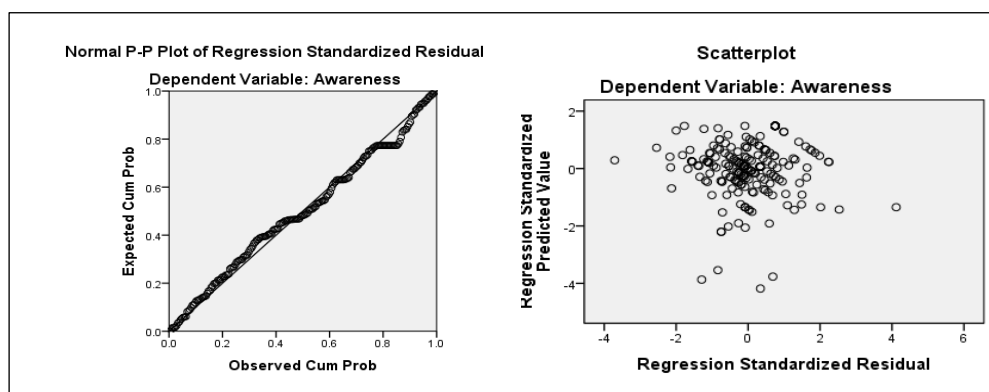


Figure 2: Normal P–P Plot of regression standardized residual for dependent variable and the scatter plot of residuals observed value and predicted value

Based on Figure 2, in the normal P-P Plot, points are laid in a reasonably straight diagonal line from bottom left to top right. It indicates no major deviation from normality. Besides that, from the scatter plot of residuals, it shows that there is no violation of the constant variance assumption for residuals as the points are randomly scattered.

### 3.3.1 Correlation Analysis

Pearson's Correlation is utilized to investigate the relationship between independent variables (IVs) and the dependent variable (DV). Correlation coefficients can give a numerical summary of the direction and the strength of the linear relationship between the IVs and DV. Pearson's relationship coefficients ( $r$ ) range from +1 to - 1 and the sign in front demonstrates whether there is a positive or negative correlation.

Table 3: Correlation Analysis

	Attitudes/Lifestyles	Knowledge	Medication
Awareness	0.622** p < 0.01	0.618** p < 0.01	0.566** p < 0.01

Based on the Pearson Correlation matrix in Table 3, it shows that there exists a significant moderate positive correlation between attitudes/lifestyles and awareness ( $r = 0.622$ ,  $p$ -value < 0.01), knowledge and awareness ( $r = 0.618$ ,  $p$ -value < 0.01) and medication and awareness ( $r = 0.566$ ,  $p$ -value < 0.01). Hence, it can be concluded that all independent variables (attitudes/lifestyles, knowledge and medication) are significantly correlated to the dependent variable (awareness).

### 3.2.2 Multiple Linear Regression Model

Thus, further analysis became possible to examine the amount of variance in the dependent variables that can be explained by independent variables. Hence, the multiple regression analysis was carried out to test if gender, education level, faculty, attitudes/lifestyles, knowledge and medication were good predictors on awareness of gastric cancer among youngsters.

Table 4 indicates that the regression model is significant ( $F(10, 339) = 39.539$ ,  $p\text{-value} < 0.05$ ).

Table 4: Summary of Regression Results ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	83.708	10	8.371	39.539	0.000
Residual	71.769	339	0.212		
Total	155.477	349			

The results in Table 5 discovered that the multiple correlations ( $R = 0.734$ ) of eight significant predictors with the criterion (dependent variable), as shown in Table 6. From the model, factors that influence the awareness of gastric cancer among youngsters are attitude/lifestyle, knowledge, medication, degree level, Faculty of Communication & Media Studies, Faculty of Business Management, Faculty of Art & Design and Faculty of Accounting. The eight factors have a significant effect size that explains 53.8% of the variability towards the awareness of gastric cancer. The adjusted  $R^2$  indicates that in the population, the eight factors account for 52.5% of the variance in respondents' awareness of gastric cancer.

Table 5: Summary of Regression Results  $R^2$

R	$R^2$	Adj $R^2$	Standard Error of the Estimates
0.734	0.538	0.525	0.460

As shown in Table 6 below, there are eight variables that can be considered as significant predictors which are attitudes ( $t = 5.070$ ,  $p\text{-value} < 0.05$ ), knowledge ( $t = 5.815$ ,  $p\text{-value} < 0.05$ ), medication ( $t = 5.266$ ,  $p\text{-value} < 0.05$ ), education level since the dummy variable (degree) is significant ( $t = -2.458$ ,  $p\text{-value} < 0.05$ ) and the faculty since the dummy variables (Communication & Media Studies), (Business and Management), (Art & Design) and (Accounting) are significant ( $t = -2.456$ ,  $p\text{-value} < 0.05$ ), ( $t = -3.009$ ,  $p\text{-value} < 0.05$ ), ( $t = -2.114$ ,  $p\text{-value} < 0.05$ ), ( $t = -3.532$ ,  $p\text{-value} < 0.05$ ) at 5% significance level. It can be concluded that awareness increases when attitudes or lifestyles of respondents increase, holding other variables constant. Similarly, the awareness of respondents about gastric cancer increases when the knowledge and medication increase, holding other variables constant. Other than that, the awareness of gastric cancer is about 14.6% lower when respondents' education level is degree compared to diploma level. The awareness of respondents about gastric cancer was about 32.3%, 36.4%, 29.1% and 56.5% lower in the Faculty of Communication & Media Studies, Faculty of Business and Management, Art & Design and Faculty of Accounting compared to respondents from other faculties, while other variables were held constant. However, gender and Faculty of Education failed to meet the selection criteria ( $p\text{-value} > 0.05$ ).



Table 6: Regression Results (Coefficients)

	B	Std Error	Beta	T	Sig.
Const.	1.327	0.193		6.880	0.000
Attitude/lifestyle	0.221	0.044	0.271	5.070	0.000
Knowledge	0.260	0.045	0.305	5.815	0.000
Medication	0.228	0.043	0.245	5.266	0.000
Male	0.033	0.058	0.022	0.567	0.571
Degree	-0.146	0.059	-0.103	-2.458	0.014
Education	0.021	0.173	0.006	0.120	0.905
Communication & Media Studies	-0.323	0.131	-0.196	-2.456	0.015
Business & Management	-0.364	0.121	-0.273	-3.009	0.003
Art & Design	-0.291	0.138	-0.139	-2.114	0.035
Accounting	-0.522	0.148	-0.202	-3.532	0.000

The estimated model is:

$$\hat{Y} = 1.327 + 0.221*\text{attitudes} + 0.260*\text{knowledge} + 0.228*\text{medication} - 0.146*\text{education level (degree)} - 0.323*\text{faculty (Communication \& Media Studies)} - 0.364*\text{faculty (Business Management)} - 0.291*\text{faculty (Art \& Design)} - 0.522*\text{faculty (Accounting)}$$

(1)

#### 4. CONCLUSION

Based on the regression analysis conducted, it can be highlighted that attitudes, knowledge, medication, education level and faculty (dummy) are some of the variables that were found to be the risk factors of the awareness on gastric cancer among the selected youngsters in the 21<sup>st</sup> century. As the R-square value was small, the risk factors may not be accurate. However, the objective of the study which is to find the relationship and risk factors that trigger gastric cancer is still obtained. Therefore, it can be concluded that awareness campaigns should be implemented in order to educate people especially youngsters at the early stage in enhancing the survival rate of gastric cancer.

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