



Lifestyles and Gastric Cancer in Adult Patients

Meliza Huacce-Prado¹, Jose M. Vela-Ruiz^{1,2}, Alejandro Leon^{*,2,3}, Germán Rossani-Alatrística¹

1. Instituto de investigaciones en Ciencias Biomédicas, Universidad Ricardo Palma. Lima, Perú.

2 Unidad de investigación oncológica, Hospital María Auxiliadora, Lima, Perú.

3 Clínica oncológica Aliada. Lima, Perú.

Corresponding Author: Dr. Alejandro Leon, Unidad de investigación oncológica, Hospital María Auxiliadora, Lima, Perú, Clínica oncológica Aliada. Lima, Perú

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Abstract

OBJECTIVE: *The objective of this article is to review the published bibliography on the relationship between lifestyles and gastric cancer in adult patients.*

METHODS: *The review was carried out through the electronic search of various scientific articles related to the subject. The PEO question was used: What is the relationship between lifestyles and gastric cancer in adult patients? The search sources were PubMed, Academic Google, and Scielo. The keywords were "LifeStyle" in combination with "Stomach Neoplasms".*

RESULTS: *Articles published from January 1, 2016, to March 31, 2021, were selected. 237 articles were found, excluding 219 for not meeting our inclusion criteria, leaving 18 articles for this review. A higher probability of gastric cancer risk was observed in respondents who had a high consumption of processed meat (AOR = 3.99, 95% CI: 0.90-17.66), preferences for a large amount of fat/oil (AOR = 4.64, 95% CI: 1.56-13.72), and preferences for high amounts of salts (AOR = 4.18, 95% CI: 1.30-13.44), likewise; Alcohol consumption is associated with an increased risk of gastric cancer among Japanese men.*

CONCLUSION: *The available evidence supports the relationship between lifestyle and gastric cancer. Being the consumption of tobacco, alcohol, the scarce consumption of vegetables and fruits and the intake of processed foods main risk factors.*

KEYWORDS: *Lifestyle, Gastric Cancer.*

Introduction

Gastric cancer continues to be a serious social and health problem, since, even though its global incidence is decreasing (1), it is still the fifth most frequent cancer and the second most common cause of death from cancer in the world, in our country it continues to be one of the most frequent and aggressive, ranking third after prostate cancer and breast cancer. During 2020, the number of new cases estimated, amounted to 6,300, equivalent to 9% of the total (69,849), 52.9% of new cases of stomach cancer occurred in males; while the remaining 47.1% was presented in the female sex; stomach cancer is the leading cause of death with 14.2% of the total (34,936) and the incidence rate considering both sexes is 26.41 per 100,000 inhabitants.

Gastric Cancer is a multifactorial disease and both environmental (68%) and genetic (22%) factors play a role in its etiology, the established risk factor for Gastric Cancer, most notably H. pylori infection, could not fully explain the heterogeneity in its distribution, only a small proportion of people who carry H. pylori in the stomach develop gastric cancer, which suggests that other factors, such as sociodemographic and dietary factors, may be responsible for carcinogenesis. Various dietary intakes and dietary habits have been widely observed to be associated with an increased risk of Gastric cancer, including smoking, alcohol consumption, and the intake of salty foods. (2)

Cancer risk perception has been suggested to be one of the key factors associated with health behavior change. Therefore, it is of particular interest if people at risk of familial cancer perceive this risk and are more motivated to change an unhealthy lifestyle. (3)

Eating habits and nutrient intake play an important role in the prevention and etiology of gastric cancer, according to the report of the World Cancer Research Fund and the American Institute for Cancer Research, increased consumption of vegetables and fruits without Starch can lower the risk of gastric cancer, while salt and salty foods can be risk factors for gastric cancer. Additionally, several other foods can be associated with stomach cancer. (4)

The objective of this article is to review the published bibliography on the relationship between lifestyles and gastric cancer in adult patients.

Methods

In the present study of systematic review, articles in English and Spanish published from January 1, 2016 to March 31, 2021 in PubMed, academic Google and Scielo were used. The PEO question was used: What is the relationship between lifestyles and gastric cancer in adult patients? Population: Adult patients, Exposure: Lifestyles, Result: Gastric cancer. The keywords were: "Life Style" [Mesh term] in combination with "Stomach Neoplasms" [Mesh term] used in Pubmed, "lifestyles", "gastric cancer" used in academic Google, "lifestyles", "gastric cancer" used in SCIELO. The syntax resulting from the advanced search was: (("Patients" [mh] OR Patient * [tiab]) AND ("Life Style" [mh] OR Life Styles * [tiab] OR Lifestyle * [tiab] OR Lifestyles * [tiab] OR Life Style Induced Illness * [tiab] OR Lifestyle Factors * [tiab] OR Factor, Lifestyle * [tiab] OR Lifestyle Factor * [tiab])) AND ("Stomach Neoplasms" [mh] OR Neoplasm, Stomach * [tiab] OR Stomach Neoplasm * [tiab] OR Neoplasms, Stomach * [tiab] OR Gastric Neoplasms * [tiab] OR Gastric Neoplasm * [tiab] OR Gastric Neoplasm * [tiab] OR Neoplasm, Gastric * [tiab] OR Neoplasms, Gastric * [tiab] OR Cancer of Stomach * [tiab] OR Stomach Cancers * [tiab] OR Gastric Cancer * [tiab] OR Cancer, Gastric * [tiab] OR Cancers, Gastric * [tiab] OR Gastric Cancers * [tiab] OR Stomach Cancer * [tiab] OR Cancer, Stomach * [tiab] OR Cancers, Stomach * [tiab] OR Cancer of the Stomach * [tiab] OR Gastric Cancer, Familial Diffuse * [tiab])). The search strategy can be seen in ANNEX 1, 2 and 3. El trabajo corresponde a la Prioridad Nacional de Investigación en Salud 2019- 2023 N° 2 Cáncer.

Inclusion Criteria:

- Articles published in the last 5 years.
- Articles containing any of the following keyword combinations in both the title and the abstract: Lifestyles along with gastric cancer; "LifeStyle" with "Stomach Neoplasms".
- Studies with significant results for our study.

Exclusion Criteria:

- Studies that are not directly related to the present topic.
- Studies with non-significant results.
- Young aged- patients (<= 18 years).

Results:

237 articles were found, excluding 173 for not being within the last 5 years, 36 for not complying with the combination of keywords in its structure, 10 were also excluded for not being directly related to the subject to be reviewed. That is, a total of 219 articles were excluded, leaving 18 articles for the analysis of this article, including 3 articles for theoretical and conceptual purposes. The study selection diagram can be seen in Figure 1.

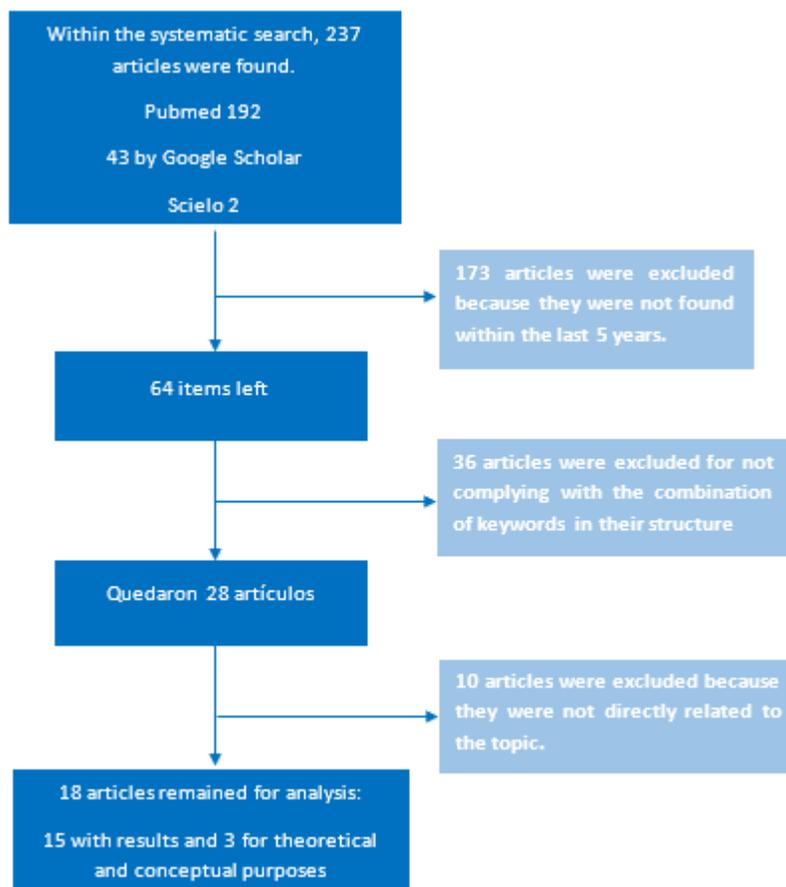


Figure 1: study selection diagram

Evidence from studies:

In the work carried out by Ping. C et al. China 2020. A case-control study was conducted with a population of 523, participants with a low socioeconomic level were observed to have a higher risk of GC compared to those in a high socioeconomic level (adjusted OR = 2.10, CI 95%: 1.13-3.89). Compared with those who drink green tea regularly, patients who did not have this dietary habit had a risk of GC almost 3 times higher (adjusted OR = 2.91, 95% CI: 1.38-6.13). Other dietary habits, including eating hard foods, skipping breakfast, consuming pickled vegetables, overeating, were associated with an increased risk of Gastric Cancer. (2)

Sumil.K.S et al. Nepal, 2020. A case-control study was carried out in two specialized cancer hospitals with a total of 237 participants (79 cases and 158 controls), a higher probability of gastric cancer risk was observed in respondents who had a high consumption of processed meat (AOR = 3.99, 95% CI: 0.90-17.66), preferences for a large amount of fats/oil (AOR = 4.64, 95% CI: 1.56-13.72), and preferences for high amounts of salts (AOR = 4.18, 95% CI: 1.30-13.44). In contrast, it was observed that respondents who consumed higher amounts of fruits (AOR = 0.21, 95% CI: 0.07-0.65) were less likely to have gastric cancer. (5)

Galvao de Azevedo et al. Brazil, 2015. They carried out a study of cut series of cases, carried out in hospitals in Recife, a study with 33 patients, where a slight predominance was obtained by women aged ≥ 60 years, from rural areas, with low levels of education and income. According to the BMI, 57.6% were normal and 69.7% were at nutritional risk when% PP was used. It was found that 42.4% were not screened for H. pylori, 48.5% had a genetic predisposition, 75.8% were sedentary, 60.6% were smokers and ex-smokers, 51, 5% were addicted to alcohol and 36.4% were overweight, there was frequent consumption of salty foods, fried foods, low fruit intake, foods containing nitrates/nitrites, as well as inadequate food preservation. Where they concluded that low socioeconomic status, physical inactivity and inadequate eating habits were predominant factors for gastric cancer in the group analyzed. (6)

Okada.E. et al. Japan, 2017. They conducted a study with Japanese patients aged 24 to 95 years with esophageal and stomach cancer who were enrolled in the BioBank Japan Project. The analysis included 365 patients with squamous cell carcinoma of the esophagus (ESCC) and 1,574 patients with gastric cancer. The result showed that in patients with gastric cancer, the risk of mortality was higher in patients with low weight than in patients with normal weight (multivariate HR = 1.66, 95% CI: 1.34, 2.05) . Compared with gastric cancer patients without physical exercise habits, those who exercised ≥ 3 times/week had a lower risk of mortality (multivariate HR = 0.75, 95% CI = 0.61, 0.93) . They concluded that underweight gastric cancer patients also have a poor prognosis, while patients with physical exercise habits have a good prognosis. (7)

Li.Y. et al. Japan, 2021. They conducted a cohort study that examined the relationship between alcohol consumption and gastric cancer risk among the Japanese population, a study involving a total of 54,682

Japanese men and women who participated in the Japan Collaborative Cohort Study. They found that alcohol consumption was associated with an increased risk of gastric cancer among men (HR in former drinkers and current alcohol consumption of <23 g, 23– <46 g, 46– <69 g and ≥ 69 g / d categories versus never drinkers were 1.82, 95% CI, 1.38-2.42, 1.41, 95% CI, 1.10-1.80, 1.47, 95% CI, 1, 17-1.85, 1.88; 95% CI, 1.48-2.38 and 1.85; 95% CI, 1.35-2.53, respectively, and that for an increase of 10 g of alcohol consumption after excluding former drinkers was 1.07, 95% CI 1.04-1.10). The association in men was seen for cardiac and non-cardial gastric cancer (HRs in the category with the highest alcohol consumption versus those who never drank were 9.96, 95% CI 2.22 to 44.67 for cardiac cancer and 2.40; 95% CI, 1.64 to 3.52 for non-drinkers). Alcohol use is associated with an increased risk of gastric cancer among Japanese men, regardless of the anatomic subsite of cancer. (8)

Vera López. EF. Ecuador. 2018. It carried out a study based on cases and controls, with a total of patients diagnosed with Gastric cancer, 141 cases and 50 controls. The data were obtained from medical records and using validated records, separating them into variables such as biological, clinical and nutritional characteristics. As a result of the sample, 77 were men, 55% and 64 were women (45%). They concluded that the various foods rich in carcinogens that are eaten by patients with or without a family history of carcinogens greatly increase the risk of developing gastric cancer. (9)

Narmeen A.A. et al. Jordan. 2021. They carried out a case-control study that included 587 adults (patients with PC, 101; patients with GC, 172; healthy controls, 314). Between March 2015 and August 2018, the objective of the study was to determine the dietary factors and lifestyle of gastric cancer patients. Who was evaluated through questionnaires of physical and personal activity based on interviews? The results suggest that body weight, physical activity, smoking, and family history of cancer are among the factors that affect the risk of Gastric Cancer among Jordanians. (10)

Hoang.BV et al. Korea. 2016. They conducted a study including 830 control subjects and 415 patients, data on demographics, medical history and lifestyle, including dietary and nutrient intake. They were collected using reliable self-administered questionnaires. Information on dietary intake was collected from the participants using a food frequency questionnaire that had previously been reported as reliable and valid. An inverse association was observed between vitamin C intake and gastric cancer risk for the oldest (≥ 120.67 mg / d) versus the lowest intake category (<80.14 mg / d) [OR (CI 95%): 0.64 (0.46-0.88)], with a significant trend in the three intake categories (P = 0.007). Foods that provide vitamin C, including cabbage [0.45 (0.32-0.63), 0.50 (0.34-0.75), 0.45 (0.25-0.81)] , strawberries [0.56 (0.40-0.78), 0.49 (0.32-0.74), 0.52 (0.29 -0.93)] and bananas [0.40 (0 , 29-0.57), 0.41 (0.27-0.62), 0.34 (0.19-0.63)], were protective factors against the risk of gastric cancer according to the results of the analyzes adjusted overall and results for men and women, respectively. (11)

Rondán Guerrero. F.R. Peru. 2016. A case-control study was carried out with a total of 84 patients with a diagnosis of gastric cancer and they were compared with 84 controls, the data were obtained from

medical records using previously validated data collection cards, which contained sociodemographic problems, clinical, pathological and environmental. Of the total sample, it was observed that 70 were men (41.7%) and 98 were women (58.3%), the majority were under 50 years of age (52.9%). A statistically significant association was found between the diagnosis of gastric cancer and the following factors: being male (OR = 5.96; 95% CI, 3.01-11.79), being 50 years old or more (OR = 3.81; 95% CI, 2.01-7.24), family history of gastric cancer (OR = 9.47; 95% CI, 3.14-28.57), H. Pylori infection (OR = 8; 95% CI, 4.01-15.95) and tobacco consumption (OR = 6.61; 95% CI, 3.18-13.73). (12)

Cave. Y. Peru. 2020. He carried out an observational, descriptive and quantitative study in 390 people who attended the prevention center of the National Institute of Neoplastic Diseases of Peru (INEN), through the use of validated instruments for the level of knowledge of prevention measures and practices of healthy lifestyles. The level of knowledge of the studied population was predominantly high with 47.70%. The healthy lifestyle practices of the studied population were predominantly moderately healthy with 58.46%. The relationship between the level of knowledge of gastric cancer prevention and healthy lifestyle practices showed a statistically significant association. The study concluded that the level of knowledge of gastric cancer prevention measures is directly proportional to the practices of healthy lifestyles in the population studied. (13)

Gamboa.M. Peru. 2016, conducted an analytical observational study to compare associations regarding food consumption and habits related to gastric adenocarcinoma (GA) in 2 groups, one with GA cases and GA controls. The average result obtained was 68 years +/- 12.6 and of the controls in 51 +/- 15.96 years. A positive association was found with the following four factors: male sex OR 8.11 (95% CI 3.9-17.0) p <0.001; chronic exposure to biomass OR 2.55 (95% CI 2.2-11-5) p <0.001, family history of gastric cancer in first degree relatives OR 2.55 (95% CI 1.1-5.8) p = 0.03 and the degree of education under OR4.42 (95% CI 2.0-9.7) p <0.001. I conclude that male sex, frequent consumption of smoked foods, chronic exposure to biomass, family history of first-degree gastric cancer, and low level of education are epidemiological risk factors for AG. (14)

Zhao.L. et al. China 2020. They conducted a study with gastric cancer patients who were identified from the gastric cancer database of the China National Cancer Center 1998-2018, In this study, they reviewed 18,441 cases of gastric cancer, overweight or obese individuals were associated with a positive history of smoking and alcohol consumption (P = 0.002 and P <0.001, respectively). Multivariate results indicated that BMI at diagnosis did not have a significant effect on prognosis. In gastrectomy patients, factors independently associated with poor survival included advanced age (HR = 1.20, 95% CI 1.05-1.38, P = 0.001), any weight loss (P <0.001), smoking history of more than 30 years (HR = 1.14, 95% CI: 1.04-1.24, P = 0.004), and increased TNM p-stage (P <0.001). The results contribute to a better understanding of lifestyle factors on the overall gastric cancer burden and long-term prognosis. In these patients, weight loss (in both the 0-10% and > 10% groups), but not BMI at diagnosis, was associated

with survival outcomes. Regarding other factors, a history of smoking for more than 30 years conferred a worse prognosis only in patients undergoing gastrectomy. (15)

Santa Cruz.R. et al. Brazil. 2019. They carried out a study between 2013 and 2015, where a total of 88 consecutive patients were enrolled and not related to a diagnosis of EOGC (Early-onset gastric cancer). Where most of the tumors were diffuse (74%) and poorly differentiated (80%). In total, 4 new missense variants of uncertain significance (VUS) were identified: c.313T> A, c.387G> T, c.1676G> A, and c.1806C> A. MLPA results revealed no rearrangements and CDH1 transcription analysis for variants of interest was inconclusive. Patients with EOGC had a higher intake of red meat (OR: 2.6, 95% CI: 1.4-4.9) and processed (OR: 3.1, 95% CI: 1.6-6 , 0) and higher fruit consumption (OR: 0.4, 95% CI: 0.3 – 0.7). (16)

Cordova. M.P. Peru 2020. I carry out a study that was descriptive, correlational, prospective and cross-sectional, the objective of which was to determine the relationship between lifestyles and cancer The main results were: The highest percentage corresponds to the female sex, aged between 31 and 50 years, with complete primary and secondary, housewives, from Cajamarca. More than half of the users have unhealthy lifestyles and more than third healthy lifestyles. . When applying the Chi-square test and the Odds Ratio (OR), it was determined that there is no statistically significant relationship between lifestyles and cancer (p = 0.066) (OR = 1.75 95% CI = 0.959 - 3.196). Therefore, the null hypothesis is accepted. (17)

Roco.A. et al. Chili. 2018. Among the risk factors for the development of cancer are smoking and alcohol consumption. In Chile, 33.6% of the population smokes and 21.2% of young people. Alcohol consumption in the Chilean population is 74.5% and in young people 12.2%. The objective of this review is to analyze the state of the art of relationship between pharmacogenetics, tobacco and alcohol as risk factors for the development of cancer. The results suggest that the presence of polymorphisms that alter the function of biotransformation enzymes phase I (CYP1A1, CYP1E1) and phase II (GST), as well as polymorphisms in DNA repair enzymes (ERCC1 / ERCC2), increase the risk of induced cancer. for the smoking and alcoholic habit. This association is important if we consider that in the Chilean population the habit of smoking and drinking alcohol is highly prevalent. (18)

The designs and results of the studies are found in Tables 4 and 5.

		DeCS	MeSH
P	Participantes	Pacientes	Pacientes
E	Exposición	Estilos De Vida	Estilo De Vida
O	Outcome	Cancer Gastrico	Neoplasias Gástricas

Table 1: systematic search. Key terms

			MeSH	Entry terms
P	Participant es	Pacientes	“Patients”[mh]	Patient*[tiab] Clients*[tiab] Client*[tiab]
E	Exposición	Estilo De Vida	“Life Style”[mh]	Life Styles*[tiab] Lifestyle*[tiab] Lifestyles*[tiab] LifeStyle Induced Illness*[tiab] Lifestyle Factors*[tiab] Factor, Lifestyle*[tiab] Lifestyle Factor*[tiab]
O	Outcome	Cancer Gastrico	“Stomach Neoplasms”[mh]	Neoplasm, Stomach*[tiab] Stomach Neoplasm*[tiab] Neoplasms, Stomach*[tiab] Gastric Neoplasms*[tiab] Gastric Neoplasm*[tiab] Neoplasm, Gastric*[tiab] Neoplasms, Gastric*[tiab] Cancer of Stomach*[tiab] Stomach Cancers*[tiab] Gastric Cancer*[tiab] Cancer, Gastric*[tiab] Cancers, Gastric*[tiab] Gastric Cancers*[tiab] Stomach Cancer*[tiab]

Table 2: systematic search: assignment of labels to terms

		MeSH + entry terms
P	Participantes	“Patients”[mh] OR Patient*[tiab]
E	Exposición	“Life Style”[mh] OR Life Styles*[tiab] OR Lifestyle*[tiab] OR Lifestyles*[tiab] OR Life Style Induced Illness*[tiab] OR Lifestyle Factors*[tiab] OR Factor, Lifestyle*[tiab] OR Lifestyle Factor*[tiab]
O	Outcome	“Stomach Neoplasms”[mh] OR Neoplasm, Stomach*[tiab] OR Stomach Neoplasm*[tiab] OR Neoplasms, Stomach*[tiab] OR Gastric Neoplasms*[tiab] OR Gastric Neoplasm*[tiab] OR Gastric Neoplasm*[tiab] OR Neoplasm, Gastric*[tiab] OR Neoplasms, Gastric*[tiab] OR Cancer of Stomach*[tiab] OR Stomach Cancers*[tiab] OR Gastric Cancer*[tiab] OR Cancer, Gastric*[tiab] OR Cancers, Gastric*[tiab] OR Gastric Cancers*[tiab] OR Stomach Cancer*[tiab] OR Cancer, Stomach*[tiab] OR Cancers, Stomach*[tiab] OR Cancer of the Stomach*[tiab] OR Gastric Cancer, Familial Diffuse*[tiab]

Table 3: systematic search. Label assignment to terms

Article name	Author / year of publication	Origin	Population	Results
Case studies and control				
Risk Factors of Gastric Cancer in High-Risk Region of China: A Population-Based Case-control Study	Ping.C al./2019 et	China	523	Compared with those who drink green tea regularly, patients who did not have this dietary habit had a risk of GC almost 3 times higher (adjusted OR = 2.91, 95% CI: 1.38-6.13). Other dietary habits, including eating hard foods, skipping breakfast, consuming pickled vegetables 30 years ago, overeating, were associated with an increased risk of GC. In addition, patients with a low socioeconomic level and who consumed pickled vegetables 30 years ago had a 6 times higher risk of GC compared to those with a high socioeconomic level, but did not consume pickled vegetables 30 years ago (OR = 6, 11, 95% CI: 3.87-9.66).
Gastric cancer and associated factors in hospitalized patients	Galvao A.I et al./ 2015	Brazil	33	It was found that 42.4% were not screened for H. pylori, 48.5% had a genetic predisposition, 75.8% were sedentary, 60.6% were smokers and ex-smokers, 51, 5% were addicted to alcohol and 36.4% were overweight. There was frequent consumption of salty foods, fried foods, low fruit intake, foods containing nitrates / nitrites, as well as inadequate food preservation.

Dietary Risk Factors Associated with Development of Gastric Cancer in Nepal: A Hospital-Based Case-Control Study	Sumil.K.S al./ 2020 et	Nepal	237	<p>In the adjusted multivariate conditional logistic regression model, an increased risk of gastric cancer was more likely among respondents who had a high consumption of processed meat (AOR = 3.99, 95% CI: 0.90-17.66), preferences high fat / oil (AOR = 4.64, 95% CI: 1.56-13.72) and high salt preferences (AOR = 4.18, 95% CI: 1.30-13.44). In contrast, it was observed that respondents who consumed higher amounts of fruits (AOR = 0.21, 95% CI: 0.07-0.65) were less likely to have gastric cancer.</p>
Effect of dietary vitamin C on gastric cancer risk in the Korean population	Hoang.BV al./2016 et	Korea	1234	<p>In analyzes adjusted for first-degree family history of gastric cancer, level of education, work, family income, smoking, and regular exercise, an inverse association was observed between vitamin C intake and the risk of gastric cancer for the elderly (≥ 120, 67 mg / d) versus the lowest intake category (<80.14 mg / d) [OR (95% CI): 0.64 (0.46-0.88)], with a significant trend in the three intake categories (P = 0.007). Foods that provide vitamin C, including cabbage [0.45 (0.32-0.63), 0.50 (0.34-0.75), 0.45 (0.25-0.81)], strawberries [0.56 (0.40-0.78), 0.49 (0.32-0.74), 0.52 (0.29 -0.93)] and bananas [0.40 (0, 29-0.57), 0.41 (0.27-0.62), 0.34 (0.19-0.63)], were protective factors against the risk of gastric cancer.</p>
Injerencia de los tipos y hábitos de alimentación en pacientes con Cáncer Gástrico	Vera Lopez .EF. / 2018	Ecuador	191	<p>As a result of the sample, 77 were men 55% and 64 were women (45%). With a significant association, 55% presented with a diagnosis of Cancer and non-cancer pathologies. The various foods rich in carcinogens that are eaten by patients with or without a family history of cancer greatly increase the risk of developing gastric cancer.</p>
Dietary and Lifestyle Factors Associated with Gastric and Pancreatic Cancers: A Case-Control Study	Narmeen A.A.et al. /2021	Jordan	587	<p>It was shown that patients with GC and PC had higher pre-diagnosis body mass indices, a higher proportion smoked and had a family history of cancer than controls. Also, the consumption of two snacks [odds ratios (OR) = 0.44, 95% confidence intervals (CI): 0.23-0.85] three snacks (OR = 0.04, 95% CI: 0.01 -0.23) and no food eaten outside (OR = 0.31, 95% CI: 0.09 - 0.99) showed a protective effect against GC, and the consumption of three snacks (OR = 0.08, 95% CI: 0.02 - 0.40) significantly reduced the risk of PC. These results suggest that body weight, physical activity, smoking, and family history of cancer are among the factors that</p>

				affect the risk of GC and PC among Jordanians.
Factores de riesgo asociados al cáncer gástrico en pacientes atendidos en el consultorio externo del servicio de gastroenterología del HNHU durante el año 2014	Rondán Guerrero. F.R./ 2016	Peru	84	A statistically significant association was found between the diagnosis of gastric cancer and the following factors: being male (OR = 5.96; 95% CI, 3.01-11.79), being 50 years old or more (OR = 3.81; 95% CI, 2.01-7.24) , family history of gastric cancer (OR = 9.47; 95% CI, 3.14-28.57), H. Pylori infection (OR = 8; 95% CI, 4.01-15.95) and tobacco consumption (OR = 6.61; 95% CI , 3.18-13.73).
ESTUDIOS COHORTE				
Alcohol Consumption and Risk of Gastric Cancer: The Japan Collaborative Cohort Study	Li.Y.et al. / 2021	Japan	54.682	Alcohol consumption was associated with an increased risk of gastric cancer among men (HR in former drinkers and current alcohol consumption of <23 g, 23– <46 g, 46– <69 g and ≥ 69 g / d categories versus never drinkers were 1.82, 95% CI, 1.38-2.42, 1.41, 95% CI, 1.10-1.80, 1.47, 95% CI, 1.17-1 , 85, 1.88; 95% CI, 1.48-2.38 and 1.85; 95% CI, 1.35-2.53, respectively, and that for an increase of 10 g in the consumption of alcohol after excluding former drinkers was 1.07, 95% CI 1.04-1.10)
OBSERVATIONAL STUDIES				
Demographic and lifestyle factors and survival among patients with esophageal and gastric cancer: The Biobank Japan Project	Okada.E.et al. / 2017	Japan	213	Among gastric cancer patients, the risk of mortality was higher in underweight patients than in normal weight patients (multivariate HR = 1.66, 95% CI: 1.34, 2.05). Compared with gastric cancer patients without physical exercise habit, those who exercised ≥3 times / week had a lower risk of mortality (multivariate HR = 0.75, 95% CI = 0.61, 0.93) . However, the lack of stage in many cases was a limitation.
Estilos de vida saludable y nivel de conocimiento de prevención del cáncer gástrico instituto nacional de enfermedades neoplásicas 2016	Cueva. Y./ 2020	Peru	390	The level of knowledge of the studied population was predominantly high with 47.70%. The healthy lifestyle practices of the studied population were predominantly moderately healthy with 58.46%. The relationship between the level of knowledge of gastric cancer prevention and healthy lifestyle practices showed a statistically significant association.

<p>Factores de riesgo epidemiológicos para adenocarcinoma gástrico en Trujillo, Perú</p>	<p>Gamboa.M./ 2016</p>	<p>Peru</p>	<p>158</p>	<p>Male sex, frequent consumption of smoked foods, chronic exposure to biomass, family history of first-degree gastric cancer, and low level of education are epidemiological risk factors for gastric adenocarcinoma</p>
<p>Lifestyle factors and long-term survival of gastric cancer patients: A large bidirectional cohort study from China</p>	<p>Zhao.L.et al. / 2020</p>	<p>China</p>	<p>18441</p>	<p>Results contribute to a better understanding of lifestyle factors on overall gastric cancer burden and long-term prognosis. In these patients, weight loss (in both the 0-10% and > 10% groups), but not BMI at diagnosis, was associated with survival outcomes. Regarding other factors, a smoking history of more than 30 years conferred a worse prognosis only in patients undergoing gastrectomy. Great efforts are needed to elucidate the mechanisms targeting the complex effects of lifestyle factors.</p>
<p>Frequency of CDH1 germline variants and contribution of dietary habits in early age onset gastric cancer patients in Brazil</p>	<p>Santa Cruz.R.et al. / 2019</p>	<p>Brazil</p>	<p>88</p>	<p>Patients with EOGC had a higher intake of red meat (OR: 2.6, 95% CI: 1.4-4.9) and processed (OR: 3.1, 95% CI: 1.6-6 , 0) and higher fruit consumption (OR: 0.4, 95% CI: 0.3 -0.7) compared to the eating habits of the Brazilian population. Eating habits may be associated with the development of EOGC.</p>
<p>TRANSVERSAL STUDY</p>				
<p>Estilos de vida y cáncer en usuarios atendidos en el servicio de diagnóstico precoz y prevención de cáncer del hospital regional docente de Cajamarca, 2019</p>	<p>Cordova.M.P./ 2020</p>	<p>Peru</p>	<p>245</p>	<p>The highest percentage corresponds to the female sex, aged between 31 to 50 years, with complete primary and secondary school, housewives, from Cajamarca. More than half of the users have unhealthy lifestyles and more than a third healthy lifestyles. More than a quarter of users have a positive cancer diagnosis and about three-quarters a negative diagnosis. When applying the Chi-square test and the Odds Ratio (OR), it was determined that there is no statistically significant relationship between lifestyles and cancer (p = 0.066) (OR = 1.75 95% CI = 0.959 - 3.196). Therefore, the null hypothesis is accepted.</p>
<p>Farmacogenética, tabaco, alcohol y su efecto sobre el riesgo de</p>	<p>Roco.A. et al./ 2018</p>	<p>Chile</p>		<p>The results suggest that the presence of polymorphisms that alter the function of biotransformation enzymes phase I (CYP1A1, CYP1E1) and phase II (GST), as well as polymorphisms in DNA repair enzymes (ERCC1 / ERCC2) increase the risk</p>

<p>desarrollar cáncer</p>				<p>of cancer induced by smoking and alcohol. This association is important, if we consider that in the Chilean population the habit of smoking and drinking alcohol is highly prevalent.</p>
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Table 4: Titles, design and results of research work related to lifestyle and gastric cancer

Title	Importance	Strengths	Weaknesses
<p>Risk Factors of Gastric Cancer in High-Risk Region of China: A Population-Based Case-control Study</p>	<p>Sociodemographic risk factors and dietary habits associated with gastric cancer were identified.</p>	<p>The sample size was adequate to allow review of the study.</p>	<p>It doesn't include some important lifestyle features.</p>
<p>Gastric cancer and associated factors in hospitalized patients</p>	<p>Low socioeconomic status, physical inactivity, and inappropriate eating habits were identified as predominant factors for gastric cancer.</p>	<p>The research provides valuable information on the topic of lifestyles.</p>	<p>Additional research is needed to validate the findings.</p>
<p>Dietary Risk Factors Associated with Development of Gastric Cancer in Nepal: A Hospital-Based Case-Control Study</p>	<p>The research provided important data on the consumption of red and processed foods.</p>	<p>The study provided insights into good nutrition education, public awareness, and changing lifestyles.</p>	<p>The study included patients with pancreatic cancer.</p>
<p>Effect of dietary vitamin C on gastric cancer risk in the Korean population</p>	<p>A protective effect of vitamin C and foods that provide vitamin C against gastric cancer was observed.</p>	<p>It values the importance of the of foods containing vitamin C as protective agents against the risk of gastric cancer.</p>	<p>It requires more studies with significant sample sizes.</p>
<p>Injerencia de los tipos y hábitos de alimentación en pacientes con Cáncer Gástrico</p>	<p>Identified risk factors associated with gastric cancer.</p>	<p>Encontró que los alimentos ricos en sustancias cancerígenas que son ingeridos por pacientes con o sin antecedentes familiares aumentan el riesgo de presenta cáncer gástrico.</p>	
<p>Dietary and Lifestyle Factors Associated with Gastric and Pancreatic</p>	<p>It demonstrated the importance of body weight, physical</p>	<p>The size of the sample, who were evaluated through questionnaires</p>	<p>The study included patients with pancreatic cancer.</p>

Cancers: A Case-Control Study	activity, smoking, and family history as risk factors for gastric cancer.	of physical and personal activity based on interviews	
Factores de riesgo asociados al cáncer gástrico en pacientes atendidos en el consultorio externo del servicio de gastroenterología del HNHU durante el año 2014	Having a family history, a previous infection with H. Pylori, and smoking were found to influence the development of gastric cancer.	A statistically significant relationship was found between cancer diagnosis and tobacco use.	The data collection sheet did not include eating habits, alcohol consumption.
Alcohol Consumption and Risk of Gastric Cancer: The Japan Collaborative Cohort Study	The association of alcohol consumption with gastric cancer was identified.	It found that alcohol consumption is associated with an increased risk of gastric cancer among Japanese men, regardless of the anatomical subsite of the cancer	The magnitude of the association could be affected due to the characteristics of the control group.
Demographic and lifestyle factors and survival among patients with esophageal and gastric cancer: The Biobank Japan Project	It was possible to determine the importance of alcohol as a poor prognosis in patients with gastric cancer, as well as patients who are underweight.	He described the distribution of demographic and lifestyle factors in patients with stomach cancer.	The sample size includes patients with esophageal cancer.
Estilos de vida saludable y nivel de conocimiento de prevención del cáncer gástrico instituto nacional de enfermedades neoplásicas 2016	I determine the relationship between healthy lifestyles and gastric cancer.	I value the level of knowledge of patients about prevention and healthy style practices.	The answers to the questions posed in the surveys are closed, which limits the analysis.
Factores de riesgo epidemiológicos para adenocarcinoma gástrico en Trujillo, Perú	He compared associations regarding food consumption and habits related to gastric adenoma.	I identify that the idea and consumption of tobacco determine a large number of cases of gastric cancer.	Not included in the sample
Lifestyle factors and long-term survival of gastric cancer patients: A large bidirectional cohort study from China	Body mass index (BMI), alcohol consumption and smoking were assessed as agents that contribute to the development of gastric cancer.	Important points such as smoking and alcohol consumption were evaluated.	Patients with low socioeconomic status.

Frequency of CDH1 germline variants and contribution of dietary habits in early age onset gastric cancer patients in Brazil	Diet habits and lifestyles were assessed in patients with early-onset gastric cancer.	The sample size a total of 88 in patients taking into account those not related to the diagnosis of gastric cancer of early onset.	The sample size was 18,441, an amount that would not allow adequate monitoring.
Estilos de vida y cáncer en usuarios atendidos en el servicio de diagnóstico precoz y prevención de cáncer del hospital regional docente de Cajamarca, 2019	The relationship of lifestyles in the development of gastric cancer was identified.	More than half of the users have unhealthy lifestyles and more than a third healthy lifestyles.	It does not include some data on lifestyles such as cigarette smoking by conducting further studies on CDH1.
Farmacogenética, tabaco, alcohol y su efecto sobre el riesgo de desarrollar cáncer	Analyze the relationship between tobacco and alcohol as risk factors for cancer.	Appreciate the importance of smoking and drinking alcohol.	They did not include the type of research study.

Table 5: Importance, strengths and weaknesses of jobs related to lifestyles and gastric cancer.

Discussion

Through this systematic review, it was observed that there is a relationship between lifestyle and gastric cancer, which has been evidenced by different authors. (2,5,6,8,10,15)

Case-control, cohort, cross-sectional studies, as well as descriptive studies, can be reviewed.

Within the case and control studies, it was observed in the work by Galvao AI. et al. in Brazil, that low socioeconomic status, physical inactivity, and inadequate eating habits were predominant factors for gastric cancer in the group analyzed. (3)

Likewise, a greater risk of gastric cancer was found with the frequent consumption of red meat, processed meats, high preferences for salt, fats/oil and seasonings due to the oxidative process that these products generate, generating free radicals and participating in the genesis of cancer. On the other hand, the regular consumption of fruits had a protective effect against gastric cancer, possibly due to the antioxidants, vitamins and minerals that it offers us. (5)

In cohort studies, it was observed that alcohol consumption is associated with an increased risk of gastric cancer among Japanese men, regardless of the anatomical subsite of cancer, in which the different races and their relationship with gastric cancer should be studied in-depth, as well as, the types of beverages and their harmful effects. (4)

Similarly, in a case-control study, it was observed that body weight, physical activity, smoking, and family history of cancer are among the risk factors for Gastric Cancer.⁶ In the case of nicotine exerts a mitogenic effect by activating the extracellular signal-regulated protein kinase (ERK) cascade; induces cyclooxygenase2 (COX-2), acting as a marker of inflammation in tumor tissue and promoting vascular endothelial growth factor (VEGF). (19)

To the protective effects of vitamin C in the diet and foods containing vitamin C on the risk of gastric cancer, a protective effect was observed, but more studies are required, as it is one of the most common antioxidants found in fruits and vegetables, vitamin C can have a chemopreventive effect. Vitamin C protects cells from oxidative DNA damage, thus blocking carcinogenesis. (7,20) In analyzes of consumption of foods that contribute vitamin C, some findings are consistent with a meta-analysis of prospective cohort studies that reported an association inverse between fruit intake and gastric cancer incidence [RR (95% CI): 0.82 (0.73-0.93)] which was stronger for follow-up periods of ≥ 10 years [0.66 (0.52-0.83)]. (20,21)

Conclusion

The available evidence supports the relationship between lifestyles and gastric cancer, with the consumption of tobacco, alcohol, the low consumption of vegetables and fruits, and the intake of processed foods being the main risk factors.

It is recommended to adopt preventive measures such as lifestyle changes and improve the level of information in our population as the main steps to start with the reduction of indicators of gastric cancer incidence.

Therefore, it is necessary to delve into research topics related to the subject and more analytical prospective studies are needed to analyze other possible factors in the development of gastric neoplasia.

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