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A Critical Discourse Analysis of Stomach Cancer: Comparing Medical Research Articles and International Medical Associations

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Abstract

This study presents a critical discourse analysis (CDA) of stomach cancer information as it appears in twenty peer-reviewed medical research articles and the publicly accessible discourses of five internationally recognised medical associations. It is argued, following Fairclough's (2015) three-dimensional CDA framework and van Dijk's (1980) macro-semantic rules, that the discourses produced by medical associations systematically diverge from the empirical findings reported in academic literature, with potentially significant consequences for public health literacy. The study adopts a qualitative analytical approach, employing Hallidayan transitivity analysis (Halliday and Matthiessen, 2014) and Martin and White's (2005) Appraisal framework to examine ideational, interpersonal, and textual metafunctions across the two corpora. The findings indicate that medical associations tend to employ generalisation and deletion as dominant discourse techniques, thereby presenting imprecise and arguably incomplete information regarding the causes and treatment recommendations for stomach cancer. In contrast, the selected research articles are found to rely predominantly on identifying relational processes and factual monoglossic clauses, which it is suggested, facilitate a more transparent and evidence-grounded representation of the disease. Furthermore, lexical chain analysis reveals considerable discrepancies between the collocational patterns deployed in academic articles and those utilised in association discourse. It is concluded that these linguistic asymmetries are not incidental but are arguably shaped by institutional ideological positions. The pedagogical and policy-level implications of these findings are also discussed, with particular reference to the need for evidence-aligned public health communication in the context of global cancer discourse.

Keywords: Critical Discourse Analysis, medical discourse, stomach cancer, transitivity, Appraisal framework, lexical cohesion, monogloss, institutional ideology, public health communication

1. Introduction

Critical Discourse Analysis (CDA) is concerned with the investigation of how language functions as an instrument of social power, inequality, and ideological reproduction (Fairclough, 2015; van Dijk, 2013). It is argued within this tradition that discursive practices are not neutral but are deeply embedded within socio-political structures that shape what may be said, by whom, and in what manner (Wodak and Meyer, 2009). In this regard, medical discourse constitutes a particularly productive site for critical linguistic investigation, given that the language of health communication operates at the intersection of institutional authority, scientific knowledge, and public trust (Wilce, 2009). The present study, consequently, takes as its point of departure the observation that significant discrepancies appear to exist between the information produced within peer-reviewed medical research and the public-facing discourses generated by internationally recognised medical associations with respect to stomach cancer.

It is worth noting that stomach cancer, clinically referred to as gastric cancer, remains among the most prevalent and lethal malignancies globally, with an estimated incidence of more than one million new cases reported annually, according to Rawla and Barsouk (2019). The Global Burden of Disease Study 2017 indicates that stomach cancer accounted for approximately 865,000 deaths worldwide in that year alone, underscoring the critical importance of accurate, accessible, and evidence-aligned public health communication regarding its causes and treatment options (Naghavi et al., 2020). Given this epidemiological significance, it is of considerable concern if, as is argued in this study, major medical associations appear to systematically employ generalised and, at times, misleading discoursal strategies in their public-facing materials on stomach cancer. The present research, therefore, seeks to illuminate these discursive asymmetries through a rigorous application of Fairclough's (2015) CDA framework, supported by Hallidayan Systemic Functional Linguistics (SFL) and van Dijk's (1980) macro-semantic model.

1.1 Rationale of the Study

There is a growing body of scholarship within applied linguistics and discourse studies that has directed critical attention toward the language of medical institutions and health communication (Yazdannik, Yousefy and Mohammadi, 2017; Golini, 2022). It is suggested by Fairclough (2015) that institutional discourse reflects and reinforces the norms, beliefs, and ideological orientations of the institutions that produce it. In the context of medical associations, it may be argued that such institutions, whilst purportedly functioning as neutral conduits for health information, are in fact subject to a range of financial, professional, and political pressures that potentially influence the nature and scope of the information they disseminate. The concept of a social contract between healthcare providers and the public, as articulated by Caelleigh (2001), implies a duty of transparency and accuracy. However, as Busing, Rosenfield and Rourke (2010) and Boelen and Heck (1995) have observed, this duty is not always systematically fulfilled by major medical organisations. The present study seeks, therefore, to investigate the extent to which this social responsibility is enacted or deflected in the specific context of stomach cancer discourse.

Furthermore, it is argued that discourse analysis provides an indispensable methodological resource for health research, insofar as it enables researchers to move beyond surface-level content to examine the structural and ideological dimensions of health communication (Yazdannik et al., 2017). CDA, in particular, is positioned within this study as a tool for critically examining the power-knowledge configurations that underpin the divergences observed between medical research articles and medical association discourse. The rationale for the present study is thus grounded in both the theoretical imperatives of critical linguistics and the urgent practical necessity of improving the quality and precision of cancer-related public health communication.

1.2 Research Objectives

The present study is guided by the following principal objectives. Firstly, it aims to determine whether international medical associations provide more precise information regarding the causes and treatment of stomach cancer in comparison to the discourses generated by peer-reviewed medical research articles. Secondly, it seeks to identify and compare the specific lexicosemantic relationships and discourse techniques deployed in both corpora with respect to their representation of stomach cancer causes and treatment recommendations. Thirdly, it

endeavours to uncover the ideological positions that may be inferred from the discoursal patterns identified within the association texts, and to assess the potential consequences of these positions for public health communication.

1.3 Research Questions

In order to address the above objectives, the following research questions have been formulated to guide the present investigation:

1. Do medical research articles or international medical associations present more precise content about the causes and treatments of stomach cancer in their respective discourses?
2. Do the medical research articles or medical associations employ similar transitivity patterns and monoglossic resources in the representation of stomach cancer causes and treatments?
3. What are the key lexicosemantic differences in the collocational patterns deployed by research articles and medical associations in their representation of stomach cancer?
4. What particular discourse techniques are utilised in the causes and recommendation sections of the international medical associations?
5. What dominant ideological positions are encoded in the discourses of medical associations, and what are the potential effects of these positions on public health awareness?

1.4 Summary of Key Findings

The results of the present study indicate that there are significant and systematic discrepancies between the discourses produced by medical research articles and those generated by international medical associations in their representation of stomach cancer. It was found that medical associations demonstrate a considerably lower frequency of factual monoglossic clauses in comparison to research articles, relying instead on assertions and presuppositions that arguably lack the empirical grounding characteristic of peer-reviewed scholarship. In addition, the application of van Dijk's (1980) macro-semantic rules to the association texts reveals a predominant reliance on the discourse techniques of generalisation and deletion, which it is argued, function to obscure the precision of information that is available in the academic literature. Furthermore, lexical chain analysis suggests that the collocational density of research

articles substantially exceeds that of association texts, indicating a more detailed and targeted representation of causative and preventive factors. These findings, taken collectively, suggest that the discourse of medical associations may not adequately reflect the state of knowledge available in peer-reviewed literature, with potentially significant implications for public health literacy.

1.5 Recommendations

On the basis of the findings of the present study, a number of recommendations are presented for consideration by health communication policy-makers, medical associations, and applied linguists. It is recommended, firstly, that medical associations systematically revise their public-facing materials on stomach cancer to ensure precise alignment with the most current evidence-based research. Secondly, it is argued that the dietary and nutritional risk factors identified consistently in the peer-reviewed literature, including high-sodium diets, excessive consumption of processed and smoked foods, tobacco use, and Helicobacter pylori infection, should be explicitly and clearly articulated in association discourse. Thirdly, it is suggested that intersectoral health communication policies be developed to govern the production of public health information by major medical institutions, particularly with regard to the clarity and specificity of causal attributions and treatment recommendations. Fourthly, it is argued that medical associations should stratify their treatment recommendations according to the severity and stage of the disease, in order to provide more actionable guidance to patients and healthcare professionals. Finally, it is proposed that future research should extend the scope of the present investigation to include a wider corpus of medical association texts and a broader range of disease categories, in order to assess the generalisability of the patterns identified herein.

2. Literature Review

2.1 Language as a Tool for Social Change

Norman Fairclough, one of the most influential theorists in the CDA tradition, argues that there exists no purely external relationship between language and society, insofar as linguistic phenomena may be regarded as social phenomena of a particular kind, whilst social phenomena are themselves, at least in part, constituted through language (Fairclough, 2015, p. 1). This position, it is argued, has far-reaching implications for the study of institutional discourse, since

it suggests that the language practices of powerful social institutions do not merely reflect an underlying social reality but are themselves constitutive of that reality. Language practice, according to Fairclough (2015), continuously co-produces the social order through the configuration of discursive conventions, which simultaneously give experiences meaning from a particular perspective, reflect ideologies, and either support or oppose prevailing relations of hegemony. Consequently, the present study is premised on the understanding that the discourses produced by medical associations are not simply descriptive but are generative of particular forms of social knowledge, authority, and, arguably, complicity.

Furthermore, it is worth noting that language functions across three broad social roles that Fairclough (2015) identifies as stratifying, identifying, and ideational, corresponding to the structural dimensions of genre, style, and grammar respectively. These functional dimensions are directly relevant to the analytical framework adopted in the present study, which draws upon Hallidayan SFL to examine how the transitivity choices, communicative styles, and textual organisation of medical discourse reflect and reproduce institutional positions on stomach cancer causation and treatment. In this sense, the analysis conducted herein may be positioned within the broader tradition of CDA scholarship that seeks to connect micro-level linguistic analysis to macro-level social critique.

2.2 Discourse: Definitions and Dimensions

The term discourse is employed in the scholarly literature with considerable variation, ranging from narrow definitions that focus on language above the level of the sentence to broader conceptualisations that encompass entire systems of knowledge production and social practice. Scollon and Scollon (2001, p. 538) suggest that discourse refers to socially shared habits of thinking, perception, and conduct that are reflected in various texts belonging to diverse genres. Wodak (2001, p. 37) similarly proposes that discourse is always explained in relation to specific situations and speech genres, and that its purpose is either to reproduce beliefs or to transform conceptual frameworks. Fairclough (2015) distinguishes three manifestations of discourse within social practices, namely genre, which shows how different modes of communication may be regarded as part of social action; discourse in the narrower sense, which refers to the various methods of constructing reality through language; and style, which relates to the ways in which

individuals express their social and personal identities. These distinctions are, it is argued, analytically productive for the purposes of the present study, insofar as they enable a differentiated examination of the multiple dimensions through which medical association discourse constructs its representations of stomach cancer.

Discourse analysis, moreover, is characterised in the scholarly literature as a discipline concerned not only with the development and transmission of meaning but also as a social practice through which individuals exercise influence over others (Daymon and Holloway, 2002, p. 141). Schiffrin (1994) identifies pragmatics, ethnomethodology, and variational sociolinguistics as the dominant approaches within discourse analysis, whilst acknowledging the interdisciplinary character of the field. The present study, consequently, draws upon multiple analytical traditions within discourse analysis, integrating the SFL-informed transitivity analysis of Halliday and Matthiessen (2014) with the critical orientation of Fairclough's (2015) three-dimensional CDA model and the macro-semantic framework of van Dijk (1980), in order to provide a comprehensive and methodologically rigorous account of the discursive practices under investigation.

2.3 Critical Discourse Analysis: Theoretical Foundations

2.3.1 Defining CDA

Critical Discourse Analysis is described by van Dijk (2001, p. 349) as an analytical research method that investigates the ways in which social power abuse and domination are enacted, reproduced, and resisted through text and talk in social and political contexts. CDA, it is argued, does not concern itself with language per se but rather with the linguistic component of social and cultural processes and institutions (Titscher et al., 2000, p. 146). Similarly, Fairclough and Wodak (1997) propose eight key characteristics of CDA, which include the centrality of social problems, the embeddedness of power relations in language, the ideological character of discourse, and the historically situated nature of discursive practices. Power abuse, injustice, and inequality are identified as the primary foci of CDA (Wodak and Meyer, 2009), and it is in this critical spirit that the present study approaches the discourses of medical associations and research articles. Moreover, Lazar (2007) argues that CDA must remain open to cross-disciplinary collaboration, given the complexity of the relationships between power, ideology,

and language, an observation that is particularly pertinent to the present study's integration of SFL and macro-semantic analysis within a broadly Faircloughian framework.

Fairclough (2001) describes CDA as a research methodology that draws on a variety of theoretical approaches, given that it is not based on academic paradigms but on social concerns (van Dijk, 2007). This transdisciplinary character of CDA is especially productive in the context of medical discourse analysis, insofar as it enables the researcher to move fluidly between textual, discursive, and social levels of analysis, thereby capturing the multi-layered character of institutionalised health communication. The present study, it is argued, exemplifies this transdisciplinary orientation through its combination of linguistic, socio-cognitive, and ideological analytical tools.

2.3.2 Fairclough's Three-Dimensional CDA Model

Fairclough's three-dimensional CDA model, as elaborated in Language and Power (1989), Discourse and Social Change (1992), and Critical Discourse Analysis (1995), proposes that every discursive event may be analysed at three interrelated levels, namely text, discursive practice, and social practice (Fairclough, 1993, p. 138). At the textual level, attention is directed to the formal linguistic features of the text, including vocabulary, grammar, cohesion, and structure. At the discursive practice level, analysis focuses on the processes of text production and interpretation, including processes of intertextuality and interdiscursivity. At the level of social practice, the institutional, organisational, and historical conditions that shape and are shaped by discursive events are examined. Fairclough (2001) argues that these three dimensions of analysis are mutually constitutive, insofar as texts are simultaneously produced within and productive of social realities. The application of this three-dimensional framework to the medical discourses examined in the present study enables a comprehensive account of the ways in which the language of stomach cancer representation is shaped by, and in turn shapes, the institutional contexts of medical knowledge production and public health communication.

It is also worth noting that Fairclough's model has been widely applied in the analysis of medical and health communication discourse in the recent literature. Park, Griffin and Gill (2012) have employed CDA-informed textual analysis to examine medical education research, identifying how particular textual practices either support or challenge prevailing norms of medical

knowledge. Similarly, Yazdannik, Yousefy and Mohammadi (2017) have demonstrated the utility of discourse analysis as a methodological resource for health-care system research, arguing that it enables researchers to uncover the hidden power dynamics that shape health communication. These precedents lend further support to the analytical approach adopted in the present study.

2.4 Systemic Functional Linguistics and Transitivity

2.4.1 Systemic Functional Linguistics

Systemic Functional Linguistics (SFL), as developed by M.A.K. Halliday and refined in collaboration with Matthiessen (Halliday and Matthiessen, 2014), provides the primary linguistic analytical framework for the present study. SFL is a theory of language that conceives of language as a system of meanings (Halliday, 1994, p. 16), and that seeks to account for the ways in which language is used for various social purposes in different situational contexts. The system of transitivity, which is central to the ideational metafunction of language in SFL, provides a set of lexicogrammatical resources for construing experience into meaning by identifying the processes, participants, and circumstantial elements that constitute the experiential content of clauses (Halliday and Matthiessen, 2014, p. 213). Transitivity analysis has been widely employed as an analytical tool in CDA research, given its capacity to reveal the ideological dimensions of representation, specifically with regard to how actions, events, and states are attributed to particular participants and how causal relations are constructed or obscured in discourse (Bloor and Bloor, 2004; Thompson, 2004; Eggins, 2004).

The three primary process types in SFL's transitivity system are material, mental, and relational processes, with three subsidiary types, namely behavioural, verbal, and existential processes, located on the boundaries between the primary categories (Halliday and Matthiessen, 2014, p. 216). Material processes construe the experience of the external world, including actions and events, whilst mental processes represent the experience of consciousness. Relational processes, which are particularly prominent in the medical discourse examined in the present study, function to establish identifying or attributive relationships between entities, and thus constitute a primary mechanism through which medical facts and causal chains are articulated in both research articles and association texts. The analysis of transitivity choices in the present study is

therefore undertaken with a view to revealing how the different process types deployed in each corpus function to construct contrasting representations of stomach cancer causation and treatment.

2.4.2 Metafunctions and the Appraisal Framework

In addition to the ideational metafunction examined through transitivity analysis, the present study also draws upon the interpersonal metafunction of language as theorised in SFL, specifically through the application of Martin and White's (2005) Appraisal framework, with particular attention to the engagement subsystem. The engagement system, according to Martin and White (2005), assesses the degree to which a text opens or closes dialogic space for alternative perspectives, distinguishing between monoglossic utterances, which present propositions as non-negotiable, and heteroglossic utterances, which acknowledge the possibility of multiple voices and viewpoints. Within the category of monogloss, Lee (2017) identifies three subtypes, namely Fact, Assert, and Presupposition, which differ in the degree to which the information they convey is presented as empirically grounded, personally evaluated, or assumed as shared knowledge. The application of this framework to the cause and treatment sections of the research articles and medical associations enables a systematic comparison of the communicative styles adopted in each corpus, and provides evidence for the claim that the monoglossic practices of the two text types reflect fundamentally different orientations toward the status of medical knowledge.

2.5 Lexical Cohesion and Van Dijk's Macro-Semantic Rules

The textual metafunction of language, as conceptualised in SFL, is examined in the present study through Halliday and Hassan's (1973) model of lexical cohesion, with particular attention to the lexical chains and collocational patterns deployed in the cause and treatment sections of the research articles and medical associations. Lexical cohesion, it is argued, functions as a key mechanism through which thematic coherence and argumentative density are achieved in medical texts, with denser and more elaborated lexical chains indicating a more detailed and precise representation of the subject matter (Halliday and Hassan, 1973). The comparative lexical chain analysis conducted in the present study reveals significant differences in the density and specificity of the collocational patterns employed in each corpus, providing further evidence

for the claim that medical association discourse systematically underrepresents the causative and preventive factors identified in peer-reviewed research.

Furthermore, the present study employs van Dijk's (1980) macro-semantic rules, as elaborated in Renkema and Schubert (2018), to analyse the discourse techniques utilised by medical associations in their representation of stomach cancer causes and treatments. Van Dijk's macro-semantic model identifies four principal rules, namely deletion, selection, generalisation, and construction, through which the macrostructure of a discourse is derived from its microstructural elements. The application of these macro-rules to the association texts enables the identification of systematic patterns of information omission and generalisation that, it is argued, function to obscure the precision of evidence-based medical knowledge. This analytical approach is consistent with recent scholarship in critical discourse and health communication that has employed van Dijk's framework to examine ideological manipulation in institutional texts (Zotzmann and O'Regan, 2016; Amoussou and Allagbe, 2018).

2.6 Medical Discourse and Institutional Ideology

Medical discourse has been extensively examined within CDA and applied linguistics as a site of institutional power and ideological reproduction (Wilce, 2009; Park et al., 2012). It is argued within this tradition that the language practices of medical institutions are not merely descriptive but are constitutive of particular forms of medical authority and patient subjectivity. Habermas (1977), cited in Wodak (2001), suggests that language functions as a tool for social control and the legitimation of power structures, and it is in this context that the discourses of medical associations may be understood as expressing and reproducing particular institutional ideologies with respect to the communication of health risk. The concept of commuserism, which is referenced in the present study, refers to the ideological practice of simplifying complex medical information for commercial or institutional purposes in ways that potentially disempower patients and undermine informed health decision-making.

Golini (2022) has recently demonstrated, through a lexical bundles analysis of patient information for radiography, that the linguistic strategies deployed in institutional health communication systematically shape patient understanding of medical procedures. Similarly, Mahlberg (2014) has argued that corpus-assisted CDA enables the identification of recurring

linguistic patterns in institutional texts that reflect and reinforce particular ideological orientations. These perspectives collectively support the analytical approach adopted in the present study and provide a rich theoretical context within which the findings of the present investigation may be interpreted. It is argued, consequently, that the systematic divergences between medical research and association discourse identified in this study are not merely linguistic phenomena but are reflective of deeper institutional ideological positions that warrant critical scrutiny from both a scholarly and a public health policy perspective.

3. Research Methodology

3.1 Research Design

The present study adopts a qualitative research design grounded in the methodological principles of Critical Discourse Analysis (CDA), as developed by Fairclough (2015). The research is positioned within an interpretive paradigm that understands language as a form of social practice, and that seeks to uncover the ideological dimensions of medical discourse through close textual analysis. The analytical framework deployed in this study integrates Fairclough's (2015) four-stage Dialectical Relational Approach (DRA), Halliday and Matthiessen's (2014) transitivity system, Martin and White's (2005) Appraisal framework, Halliday and Hassan's (1973) model of lexical cohesion, and van Dijk's (1980) macro-semantic rules. It is argued that this multi-layered analytical framework enables a comprehensive and nuanced examination of the discursive practices of both medical research articles and medical associations, thereby providing a robust evidential basis for the claims advanced in the present study.

3.2 Data Collection and Sampling

The data for the present study were collected through a purposive sampling procedure, which was adopted on the grounds that the research objective required the selection of texts that would enable a meaningful comparison between the discourses of peer-reviewed medical research and those of internationally recognised medical associations. A total of twenty medical research articles related to stomach cancer, published in indexed academic journals, and five internationally recognised medical associations were selected for analysis. The sampling was restricted to texts that explicitly address the causes and treatment recommendations for stomach cancer, in order to ensure the comparability of the two corpora.

The following tables provide the full bibliographic details of the sampled research articles and the names and web addresses of the medical associations included in the study.

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Table 1
Sampled Medical Research Articles on Stomach Cancer

No.	Title of Article	Year	Authors
1	Global burden of stomach cancer in 195 countries, 1990-2017: GBD 2017	2020	Naghavi et al.
2	Gastric Cancer in Young Adults: Carcinogenesis to Prognosis	2020	Jian Li
3	Public Awareness of Gastric Cancer Risk Factors in a High Risk Region	2009	Oh et al.
4	Low baseline awareness of gastric cancer risk factors in New York City	2020	Shah et al.
5	Helicobacter pylori-Induced Inflammation and Risk of Gastric Cancer	2021	Kumar, Patel and Ghoshal
6	Epidemiology of gastric cancer: global trends, risk factors and prevention	2019	Rawla and Barsouk
7	Gastric cancer prevention strategies: a global perspective	2020	Eusebi
8	Dietary factors and stomach cancer mortality	2002	Ngoan et al.
9	Gastric Cancer: A Brief Review, from Risk Factors to Treatment	2020	Cuzzuol et al.
10	Dietary Nitrates, Nitrites, and Nitrosamines and the Risk of Gastric Cancer	2015	Song, Wu and Guan
11	Dietary salt intake and gastric cancer: The Hisayama study	2006	Shikata et al.
12	Alcohol drinking and gastric cancer risk: a meta-analysis	2012	Tramacere et al.
13	Dietary Fiber Intake Reduces Risk for Gastric Cancer: A Meta-analysis	2013	Zhang et al.
14	Consumption of fruit and risk of gastric cancer: meta-analysis of cohort studies	2014	Wang et al.
15	Stomach Cancer and Exposure to Talc Powder: Population-Based Study	2019	Chang et al.
16	Gastric cancer: prevention, risk factors and treatment	2011	Zali, Rezaei-Tavirani and Azodi
17	Current cancer situation in China: 2018 Global	2019	Feng et al.

No.	Title of Article	Year	Authors
	Cancer Statistics		
18	Risk factors for gastric cancer in Fujian, China: case-control study	2018	Yuan et al.
19	Global, regional, and national burden of stomach cancer: GBD 2017	2020	Naghavi et al.
20	Risk factors for stomach cancer: systematic review and meta-analysis	2020	Poorolajal, Moradi and Mohammadi

Table 2
International Medical Associations Included in the Study

No.	Association Name	Web Address
1	Mayo Clinic	mayoclinic.org/diseases-conditions/stomach-cancer
2	WebMD	webmd.com/cancer/understanding-stomach-cancer-symptoms
3	American Cancer Society	cancer.org/cancer/stomach-cancer.html
4	American Society of Clinical Oncology (ASCO)	cancer.net/cancer-types/stomach-cancer
5	National Cancer Institute	cancer.gov/types/stomach

3.3 Analytical Framework

The analytical framework of the present study is structured around the four stages of Fairclough's (2012) Dialectical Relational Approach (DRA). In Stage 1, the social wrong is identified through semiotic analysis of the discourses of the medical associations, employing Hallidayan transitivity analysis (Halliday and Matthiessen, 2014) to examine the ideational metafunction, Martin and White's (2005) engagement system to investigate the interpersonal metafunction, and Halliday and Hassan's (1973) lexical cohesion model to analyse the textual metafunction. In Stage 2, the obstacles to addressing the social wrong are identified through an examination of the collocational patterns and macro-semantic strategies deployed in the association texts, drawing upon van Dijk's (1980) macro-rules of deletion, selection, generalisation, and construction. In Stage 3, the question of whether the prevailing social order requires the perpetuation of the social wrong is addressed through an ideological critique of the association discourses. In Stage 4, possible ways of addressing the identified obstacles are proposed on the basis of the analytical

findings. This four-stage analytical procedure, it is argued, provides a methodologically coherent and theoretically grounded framework for investigating the discursive asymmetries identified in the present study.

3.4 Analytical Procedures

In accordance with the analytical framework described above, the following specific analytical procedures were carried out in the present study. Firstly, the transitivity choices and types of monogloss used in the cause and treatment sections of the research articles and medical associations were identified and tabulated. Secondly, lexical strings were constructed from the causes and recommendations identified in each corpus, and the frequencies of shared lexical items were computed. Thirdly, the lexical strings of research articles and associations were numerically compared to identify convergences and divergences. Fourthly, taxonomical and expectancy relations within the lexical strings were examined, with particular attention to hyponymical and meronymical relations. Fifthly, van Dijk's (1980) macro-rules were applied to the association lexical strings to identify the dominant discourse techniques in operation. Finally, the ideological orientations underpinning these discourse techniques were examined and critically discussed with reference to relevant theoretical frameworks.

4. Data Analysis and Discussion

The data analysis in the present study is organised in accordance with the four stages of Fairclough's (2012) Dialectical Relational Approach. Stage 1, which focuses upon the social wrong in its semiotic aspects, comprises a comparative analysis of the transitivity choices, monoglossic resources, and lexical strings deployed in the cause and treatment sections of the research articles and medical associations. Stage 2 identifies the obstacles to addressing the social wrong through an examination of collocational patterns and macro-semantic strategies. Stage 3 considers whether the social order needs the social wrong, whilst Stage 4 identifies possible ways past the obstacles. Taken together, these four stages of analysis provide a comprehensive account of the discursive asymmetries between medical research and association discourse identified in the present study.

4.1 Stage 1: Content Representation in the Ideational Metafunction

In order to investigate the content representation in the ideational metafunction, a transitivity analysis of the cause sections of the research articles and medical associations was conducted. The linguistic relationships and potential uses of these relationships were revealed by the examination of content representation in the two corpora. The following table presents a comparative overview of the transitivity choices identified in the cause sections of the research articles and the associations respectively.

Table 3
Comparative Transitivity Choices in Medical Research Articles and Medical Associations

Process Type	Sub-Type	Research Articles (%)	Medical Associations (%)
Relational	Identifying	47	40
Relational	Attributive	11	10
Material		22	30
Mental		8	8
Verbal		6	7
Existential		6	5

As is indicated in Table 3, the majority of both corpora deploy relational processes as the dominant process type. It is suggested, in accordance with Halliday and Matthiessen (2014, p. 215), that relational clauses model experience as being rather than doing or sensing, thereby providing a mechanism for the definition and characterisation of entities and their attributes. In the context of medical research articles, the high frequency of identifying relational clauses, it is argued, functions to create explicit cause-and-effect chains among the different factors responsible for the development of stomach cancer, as illustrated in the following example extracted from Poorolajal, Moradi and Mohammadi (2020):

> *Many factors may play a role in the development of stomach cancer. Advanced age, male sex, ethnicity, and genetic factors may contribute to the development of stomach cancer, but they are neither modifiable nor preventable. However, nutritional factors and*

behavioural factors such as cigarette smoking and drinking alcohol, as well as Helicobacter pylori infection, also contribute to the development of stomach cancer.

The above example illustrates how the identifying relational process is deployed in research article discourse to provide the reader with clear cause-and-effect relationships pertaining to stomach cancer development. In contrast, as is indicated in Table 3, the medical associations demonstrate a comparatively higher frequency of material processes, which it is argued, function to describe the actions and events associated with stomach cancer development without necessarily providing the causal precision that characterises the identifying relational processes of the research articles. Furthermore, the following table presents the individual transitivity frequencies for each of the five medical associations, indicating that individual associations vary considerably in their process type distributions.

Table 4
Individual Transitivity Frequencies in Medical Association Texts

Process	Sub-Type	Mayo Clinic	WebMD	ACS	ASCO	NCI
Relational	Identifying	4	2	2	3	3
Relational	Attributive	0	1	2	0	1
Material		3	4	2	1	2
Mental		1	1	0	0	1
Verbal		0	0	1	0	1
Existential		0	1	0	0	1

The individual frequencies presented in Table 4 indicate that most associations demonstrate a tendency toward material process deployment rather than the identifying relational processes predominant in the research articles. It is worth noting that this pattern of material process usage, whilst not in itself ideologically problematic, has the effect of presenting the causation of stomach cancer as a series of actions and events rather than as a structured network of causally related factors, thereby reducing the precision and clarity of the information communicated to readers.

4.2 Stage 1: Communicative Styles in the Interpersonal Metafunction

In addition to the ideational dimension of discourse, the communicative styles employed in the representation of stomach cancer content were examined through Martin and White's (2005) Appraisal framework, with particular attention to the three types of monoglossic clauses identified by Lee (2017), namely Fact, Assert, and Presupposition. The following tables present the monoglossic resources identified in each corpus.

Table 5
Types of Monogloss Identified in Medical Research Articles

Fact	Assert	Presupposition
Helicobacter pylori infection	Family history of gastric cancer	Older age
Smoking	Variety of genes	Male sex
Excessive use of processed meat	Lifestyle factors (low socioeconomic status)	
High consumption of alcohol	High level of stress, depression	
Diet high in smoked, pickled and salted foods		
Being overweight or obese		
Low consumption of fresh fruits and vegetables		

Table 6
Types of Monogloss Identified in Medical Association Texts

Fact	Assert	Presupposition
Smoking	Lifestyle factors (low socioeconomic status)	Older age
Salty and smoked foods	Environmental factors	Male sex
Drinking alcohol regularly	Race/ethnicity	
Overweight or obese	History of gastric surgery	

Fact	Assert	Presupposition
Infection with H. pylori	Blood type A	
	Sugar-sweetened beverages	
	A diet low in fruits and vegetables	
	Red and processed meats	

Table 7
Comparative Frequencies of Monoglossic Resources in Research Articles and Medical Associations

Type of Monogloss	Research Articles (%)	Medical Associations (%)
Fact	79	33
Assert	15	61
Presupposition	6	6

As is indicated in Table 7, the salient difference between the two corpora lies in the distribution of Fact and Assert monoglossic resources. The predominant use of Fact monoglossic clauses in the research articles, which account for 79% of all monoglossic instances, indicates that the communicative style of peer-reviewed scholarship characteristically presents the information of stomach cancer in a manner that is grounded in empirical evidence and experimental verification. In contrast, the medical associations deploy Assert clauses at a frequency of 61%, suggesting that a substantial proportion of the information communicated in association texts is based on personal or institutional judgment rather than independently verifiable empirical grounds. It is argued, consequently, that the communicative style of the medical associations does not consistently reflect the epistemological standards of evidence-based medicine, and that this

discrepancy has potentially significant implications for the reliability of the health information received by the general public.

The above pattern is further illustrated by the following example extracted from the National Cancer Institute's website, in which assert-type clauses are employed to describe the causes of stomach cancer:

> *Genetic conditions may increase the risk of stomach cancer in people with Type A blood, Li-Fraumeni syndrome. Environmental factors that may increase the risk of stomach cancer include being exposed to radiation, working in the rubber or coal industry.*

It is worth noting that the modal verb may in the above example functions as an evaluative marker that introduces epistemic uncertainty, rendering the propositions arguable rather than factual. This pattern of assertion-based communication, it is suggested, stands in marked contrast to the factual communicative style characteristic of the research articles, in which causes are presented as empirically established findings rather than tentative possibilities.

4.3 Stage 1: Textual Organisation and Lexical Chain Analysis

4.3.1 Lexical Strings of Research Articles

The following tables present the lexical strings constructed from the cause sections of the twenty research articles, providing a systematic overview of the factors identified in peer-reviewed scholarship as contributing to the development of stomach cancer.

Table 8

Frequency of Causes of Stomach Cancer Identified in Medical Research Articles

No.	Causal Factor	Frequency
1	A diet low in fresh fruits and vegetables	8
2	Smoking	17
3	Excessive use of processed meat	5
4	High consumption of alcohol	12
5	Diet high in smoked, pickled and salted foods	14
6	Being overweight or obese	7
7	Frequent use of cooking oil	1
8	High consumption of nitrites and NDMA	1

No.	Causal Factor	Frequency
9	Helicobacter pylori infection	16
10	High level of stress and depression	3
11	Physical inactivity	3
12	Long-term stomach inflammation (gastritis)	5
13	Family history of gastric cancer	5
14	Genetic factors (MCC, APC, p53 tumour suppressor genes)	4
15	Lifestyle factors including low socioeconomic status	6
16	Environmental factors	2
17	Race/ethnicity	3
18	History of gastric surgery	2
19	Blood type A	2
20	Older age	2

Table 9

Frequency of Causes of Stomach Cancer Identified in Medical Association Texts

No.	Causal Factor	Frequency
1	Smoking	5
2	Salty and smoked foods	5
3	A diet low in fruits and vegetables	2
4	Overweight or obese	5
5	Red and processed meats	1
6	Sugar-sweetened beverages	1
7	Gastroesophageal reflux disease	3
8	Family history of stomach cancer	3
9	Infection with H. pylori	2
10	Drinking alcohol regularly	4
11	Type A blood	2
12	Certain genes	1
13	Environmental factors (industrial exposure)	2

No.	Causal Factor	Frequency
14	Hereditary factors (Lynch syndrome, familial adenomatous polyposis)	2
15	Grapefruit and grapefruit juice	1
16	Helicobacter pylori infection	2

Table 10

Comparative Analysis of Causes of Stomach Cancer in Research Articles and Medical Associations

No.	Causal Factor	Frequency in Journals	Frequency in Associations
1	A diet low in fresh fruits and vegetables	8	2
2	Smoking	17	5
3	Excessive use of processed meat	5	1
4	High consumption of alcohol	12	4
5	Diet high in smoked, pickled and salted foods	15	5
6	Being overweight or obese	7	5
7	Frequent use of cooking oil	1	0
8	Helicobacter pylori infection	16	2
9	High level of stress and depression	3	0
10	Long-term stomach inflammation (gastritis)	5	3
11	Family history of gastric cancer	5	3
12	Genetic factors (MCC, APC, p53 tumour suppressor genes)	4	1
13	Lifestyle factors and physical inactivity	9	0
14	Environmental factors	2	2
15	Race/ethnicity	3	0
16	History of gastric surgery	2	0
17	Blood type A	2	2
18	Older age	2	0
19	Sugar-sweetened beverages	0	1
20	Gastroesophageal reflux disease	0	3

No.	Causal Factor	Frequency in Journals	Frequency in Associations
21	Hereditary factors	0	2
22	Grapefruit and grapefruit juice	0	1

As is indicated in Table 10, there are substantial and systematic discrepancies between the frequencies with which particular causal factors are identified in research articles and in association texts. Notably, smoking is identified in seventeen research articles but in only five association texts, whilst Helicobacter pylori infection, arguably the most consistently identified causal factor in the peer-reviewed literature, is referenced in sixteen research articles but in only two association texts. Similarly, high alcohol consumption is identified in twelve research articles but in only four associations. These patterns, it is argued, provide strong evidential support for the claim that medical association discourse systematically underrepresents the causal factors identified in the peer-reviewed literature, thereby potentially misleading the public with respect to the primary risk factors for stomach cancer. In contrast, several factors that receive little or no mention in the research articles, such as gastroesophageal reflux disease and grapefruit consumption, are identified in association texts, suggesting that association discourse may at times prioritise factors that are less centrally implicated in the research literature.

4.3.2 Collocation Analysis

In order to further examine the discursive asymmetries between the two corpora, a comparative collocational analysis was conducted. The following table presents the collocational patterns deployed with the primary causal factors of stomach cancer in the research articles and the associations respectively.

Table 11

Collocational Patterns Associated with Causal Factors in Research Articles and Medical Associations

Factor (Articles)	Collocation (Articles)	Factor (Associations)	Collocation (Associations)
Diet	Low in fresh fruits/vegetables OR high in smoked/pickled/salted foods	Obesity	Excess body weight

Factor (Articles)	Collocation (Articles)	Factor (Associations)	Collocation (Associations)
Drugs	High potency tobacco; high alcohol consumption	Drugs	Drinking alcohol regularly
Infection	Helicobacter pylori (specific bacterial strain)	Genetic	Factors (unspecified)
Environment	Working in coal or metal industries	Environment	Certain occupations
Genetic factors	Family history; MCC, APC, p53 tumour suppressor genes	Genetic factors	Inherited cancer syndromes
Foods	Processed meat; cooking oil; nitrites	Eating	Diet high in salt
Gastritis	Long-term stomach inflammation; history of gastric surgery	Hereditary	Factors (unspecified)
Lifestyle	Low socioeconomic status; physical inactivity	Reflux	Gastroesophageal reflux disease
Obesity	Being overweight or obese	Beverages	Sugar-sweetened beverages

As is indicated in Table 11, research articles deploy considerably more specific and elaborated collocational patterns than the medical associations, employing precise lexical items that identify particular dietary components, specific bacterial strains, and named genetic mutations as causal factors. In contrast, the collocational patterns of the associations tend toward generality, employing vague terms such as genetic factors, certain occupations, and environmental factors without providing the specificity that would enable readers to take targeted preventive action. It is argued, consequently, that the greater collocational density of research article discourse reflects a commitment to public health precision that is not consistently replicated in association discourse, and that this discrepancy is likely to have negative consequences for the health literacy of the general public.

4.4 Stage 2: Macro-Semantic Rules Applied to Association Discourse

In order to identify the obstacles to addressing the social wrong of imprecise health communication, van Dijk's (1980) macro-semantic rules were applied to the discourse of the

medical associations. The following table presents the macro-rules identified in the representation of stomach cancer causes by the associations.

Table 12
Macro-Semantic Rules Applied to Causal Discourse of Medical Associations

No.	Discourse Instance	Macro-Rule Applied
1	A diet low in fresh fruits and vegetables	Generalisation
2	Smoking	Generalisation
3	Excessive use of processed meat	Generalisation
4	High consumption of alcohol	Generalisation
5	Diet high in smoked, pickled and salted foods	Generalisation
6	Being overweight or obese	Generalisation
7	Frequent use of cooking oil	Deletion
8	Helicobacter pylori infection	Generalisation
9	High level of stress and depression	Deletion
10	Long-term stomach inflammation (gastritis)	Generalisation
11	Family history of gastric cancer	Generalisation
12	Genetic factors (MCC, APC, p53 tumour suppressor genes)	Generalisation
13	Lifestyle factors and physical inactivity	Deletion
14	Environmental factors	Generalisation
15	Race/ethnicity	Deletion
16	History of gastric surgery	Deletion
17	Blood type A	Generalisation
18	Older age	Deletion
19	Sugar-sweetened beverages	Selection
20	Gastroesophageal reflux disease	Selection
21	Hereditary factors	Selection
22	Grapefruit and grapefruit juice	Selection

As is evident from Table 12, the most frequently deployed macro-rules in the association texts are generalisation and deletion, which together account for the majority of the identified discourse instances. Generalisation operates by replacing specific, precise lexical items with more broadly applicable terms, thereby reducing the informational density of the discourse. Deletion, in contrast, operates by entirely omitting causal factors from the association discourse that are prominently identified in the peer-reviewed literature. Selection, which involves the introduction of factors not centrally identified in the research literature, is deployed in a small number of instances, suggesting that association discourse occasionally foregrounds peripheral factors at the expense of more centrally important ones. These patterns, taken collectively, indicate that the obstacle to accurate health communication in the association context is not random but appears to be the product of systematic discursive choices that function to simplify and generalise information in ways that may not serve the best interests of the general public.

Similarly, Table 13 below presents the macro-rules applied to the treatment and recommendation sections of the association texts, revealing a comparable pattern of generalisation and deletion.

Table 13

Macro-Semantic Rules Applied to Treatment Recommendations of Medical Associations

No.	Recommendation Instance	Macro-Rule Applied
1	Reduce salty and smoked foods	Generalisation
2	Stop smoking	Generalisation
3	Eat fresh vegetables and fruit	Generalisation
4	Avoid alcohol	Generalisation
5	Maintain a healthy weight	Generalisation
6	Antioxidant supplements (vitamins A, C, and E)	Deletion
7	Green tea	Deletion
8	H. pylori eradication	Generalisation
9	Herbal medicine and drug safety	Generalisation
10	Physical activity	Generalisation
11	Consuming onion or garlic	Deletion

No.	Recommendation Instance	Macro-Rule Applied
12	Lifestyle modifications	Deletion
13	Eliminating environmental risk factors	Deletion
14	Improvement of sanitary and hygienic conditions	Deletion
15	Widespread antibiotic use	Deletion
16	Targeted and Immune Checkpoint Therapy	Deletion
17	Chemoprevention	Selection
18	Taking dietary supplements	Selection

It is indicated in Table 13 that deletion is the dominant macro-rule applied in the recommendation sections of the association texts, affecting a substantial range of specific treatment recommendations that are prominently featured in the research literature, including antioxidant supplementation, H. pylori eradication protocols, lifestyle modification, sanitary improvements, and targeted therapies. The systematic deletion of these recommendations from association discourse, it is argued, constitutes a significant obstacle to effective public health communication and may reflect underlying institutional ideological orientations that merit critical scrutiny.

4.5 Comparative Analysis of Treatment Recommendations

Table 14
Comparative Frequencies of Treatment Recommendations in Research Articles and Medical Associations

No.	Treatment / Recommendation	Frequency in Journals	Frequency in Associations
1	Reduce salty and smoked foods	6	1
2	Stop smoking	11	3
3	Eat fresh vegetables and fruits	12	5
4	Avoid alcohol	5	1
5	Maintain a healthy weight	2	1
6	Antioxidant supplements (vitamins A, C, E)	1	0
7	Green tea consumption	2	0

No.	Treatment / Recommendation	Frequency in Journals	Frequency in Associations
8	H. pylori eradication	7	1
9	Herbal medicine and drug safety	1	2
10	Physical activity	4	1
11	Consuming onion or garlic	1	0
12	Lifestyle modifications	5	0
13	Eliminating environmental risk factors	1	0
14	Improvement of sanitary and hygienic conditions	2	0
15	Widespread antibiotic use	1	0
16	Targeted and Immune Checkpoint Therapy	2	0
17	Chemoprevention	0	1
18	Taking dietary supplements	0	1

The comparative data presented in Table 14 indicate that there are systematic and substantial discrepancies between the treatment recommendations identified in the research articles and those featured in the association texts. Notably, H. pylori eradication, which is identified as a treatment recommendation in seven research articles, appears in only one association text, whilst lifestyle modification, featured in five research articles, is absent from all five association texts. It is argued, consequently, that the systematic underrepresentation of evidence-based treatment recommendations in association discourse constitutes a form of discursive manipulation that may serve institutional interests at the expense of public health awareness. These findings are consistent with the broader critical discourse literature on institutional ideology and health communication, as discussed in the literature review.

4.6 Stage 3: Ideological Analysis

The results of the first and second stages of analysis confirm how collocational patterns and macro-rules of generalisation, deletion, and construction are employed by medical associations for what may be argued are manipulative discursive purposes. It is worth considering what ideological positions might underlie the employment of these discourse techniques. At this stage

of the analysis, the ideological dimensions of the association discourse are examined in greater detail.

It is suggested that the predominant deployment of generalisation in the association discourse reflects an institutional orientation that prioritises broad, easily digestible information over the precise, evidence-grounded details that would be necessary to enable the general public to make genuinely informed health decisions. Furthermore, the systematic deletion of lifestyle-related and socioeconomic causal factors from association discourse may be interpreted as reflecting an ideological position that seeks to individualise health responsibility whilst deflecting attention from the structural determinants of stomach cancer risk. These interpretations are consistent with the broader CDA literature on institutional ideology and health communication, which has consistently argued that the language of health institutions reflects and reproduces the power structures of the medical-industrial complex (Fairclough, 2015; van Dijk, 2013).

Moreover, it is argued that the concept of commuserism, as referenced in the present study's analytical framework, provides a useful conceptual lens through which to understand the ideological functions of the generalisation and selection strategies deployed by medical associations. By simplifying complex medical information for ostensibly populist purposes, the associations may be understood as inadvertently, or indeed deliberately, maintaining a degree of epistemic dependence on the part of the general public that serves the institutional interests of the medical profession and the pharmaceutical industry. These ideological implications, it is suggested, warrant serious attention from health communication policy-makers and applied linguists alike.

4.7 Stage 4: Possible Ways Past the Obstacles

On the basis of the preceding analysis, a number of possible ways of addressing the identified obstacles to accurate and evidence-aligned public health communication are proposed in the present section. It is argued, firstly, that medical associations should undertake a systematic review of their public-facing materials on stomach cancer to ensure that the specific causal factors and treatment recommendations most consistently identified in the peer-reviewed literature are explicitly and accurately represented. Secondly, it is suggested that health communication policies should be developed at both national and international levels to govern

the production of public health information, with particular emphasis on the requirement for evidence alignment and causal precision. Thirdly, it is proposed that the collocational patterns and informational density of association discourse should be benchmarked against those of peer-reviewed research, and that associations should be required to justify any significant deviations from the evidence base. Finally, it is argued that applied linguistic research, of the kind exemplified in the present study, should be more systematically integrated into the evaluation of public health communication, given its capacity to uncover the ideological dimensions of institutional discourse that are not visible through content analysis alone.

5. Conclusion

The present study has sought to demonstrate, through a rigorous and multi-layered application of critical discourse analysis, that significant and systematic discrepancies exist between the discourses produced by peer-reviewed medical research articles and those generated by internationally recognised medical associations in their representation of stomach cancer. It has been argued, following Fairclough's (2015) three-dimensional CDA framework and van Dijk's (1980) macro-semantic model, that these discrepancies are not incidental but reflect deeper institutional ideological positions that shape the character and scope of health information communicated to the general public.

In the ideational dimension, transitivity analysis has revealed that whilst research articles predominantly deploy identifying relational processes to construct explicit and precise cause-and-effect chains, the medical associations favour material processes that describe actions and events without necessarily providing the causal specificity available in the academic literature. In the interpersonal dimension, the analysis of monoglossic resources has demonstrated that research articles present their propositions primarily as Fact, thereby grounding their claims in empirical evidence, whilst the associations rely predominantly on Assert-type clauses that introduce epistemic uncertainty and reduce the authority of the information communicated. In the textual dimension, lexical chain analysis has shown that the collocational patterns of the research articles are substantially more specific and informatively dense than those of the

associations, further supporting the claim that association discourse systematically underrepresents the state of knowledge available in the peer-reviewed literature.

The application of van Dijk's (1980) macro-semantic rules to the association texts has further revealed that generalisation and deletion are the dominant discourse techniques in operation, functioning to simplify and abbreviate the representation of stomach cancer causes and treatment recommendations in ways that are potentially misleading to non-specialist readers. These findings, it is argued, are consistent with a broader ideological critique that identifies the language practices of medical associations as reflecting an institutional orientation that may serve professional and commercial interests at the expense of public health empowerment.

Consequently, it is proposed that the pedagogical and policy implications of the present study are considerable. At the level of health communication policy, it is argued that the findings provide a strong case for the development of more rigorous standards governing the accuracy and evidential alignment of public health information produced by medical associations. At the level of applied linguistics pedagogy, the study demonstrates the analytical power of combining Faircloughian CDA, Hallidayan SFL, and van Dijkian macro-semantic analysis in the investigation of institutional discourse, and it is suggested that this multi-layered methodological approach merits wider adoption in the field of health communication research. Furthermore, it is recommended that future research should extend the scope of the present investigation to include a broader range of disease categories and a more diverse range of institutional contexts, in order to assess the generalisability of the patterns identified herein. It is also argued that quantitative corpus-linguistic methods could profitably be integrated with the qualitative CDA approach adopted in the present study, in order to provide a more robust and comprehensive account of the discursive asymmetries between medical research and institutional health communication discourse.

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