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Dialogical functions of metaphors in medical interactions

Abstract: This paper proposes a method for analyzing the dialogical functions of metaphors in communicative interactions, and more specifically in the context of medical interviews. The dialogical goals proposed and pursued by the interlocutors are coded using a coding scheme that captures seven mutually exclusive categories of dialogical moves. The functions of the moves, including metaphors, can be identified and correlated with other variables relevant to the type of communication under analysis. The coding scheme is used to analyze a corpus of 39 interactions between healthcare providers and patients affected by Type 2 diabetes. The exploratory quantitative analysis, for the purpose of determining the different distributions of metaphor uses between patients and providers, is combined with qualitative analysis in which the thematic areas of the metaphors are considered. The findings show how patients and providers use metaphors for pursuing different dialogical goals and meeting distinct communicative needs.

Keywords: argumentation; dialogue analysis; metaphors; patient–provider communication; type 2 diabetes

1 Introduction

Metaphors are considered fundamental dialogical and discursive phenomena, which can have distinct textual manifestations and perform different functions (Semino 2008). Metaphors allow us to present technical or scientific concepts in terms of familiar domains or emphasize a specific dimension of a state of affairs

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that can trigger a positive or negative evaluation. When a doctor explains that "in this way you *shelter* yourself from hypoglycemia," the metaphor used is an instrument for conveying at the same time a negative evaluation on hypoglycemia and emphasizing the desirability of the suggested course of action. The metaphor is constitutive of the purpose of the utterance, aimed at persuading (namely providing an argument to) the interlocutor.

Metaphors are used in the context of healthcare communication for a wide range of dialogical purposes, as tools for evoking emotions and developing affective contexts and interpersonal intimacy, for persuading the interlocutor, or for promoting understanding and change of behaviour (Casarett et al. 2010; Gibbs 2006; Rossi 2021). However, how is it possible to represent the different dialogical purposes of utterances, and how can one capture the different strategies that speakers pursue through metaphors?

The purpose of this paper is to advance a method for analyzing what metaphors can be used to do in a dialogue. It will be shown that systematic studies intended to capture the different functions of metaphors in medical dialogues are still missing (Section 2). The functions of metaphors will then be described within the context of the new methodology, the MEthod for Dialogue Analysis (MEDA), in terms of dialogue moves, namely proposals of joint dialogical activities expressed by dialogical sequences (Macagno and Bigi 2017; Section 3). This methodology will be illustrated through an exploratory analysis of a corpus of interviews in diabetes care, pointing out the different strategic uses of metaphors by healthcare providers and patients (Section 4). The quantitative analysis is then combined with a qualitative study that considers the functions of metaphors, which are classified in broad thematic areas relevant to the activity examined (Section 5).

2 Literature review

Following Aristotle's Poetics (1457b, 7–10), metaphors are defined as a type of "transference," consisting "in giving the thing a name that belongs to something else" (Aristotle 1991). This transference of name can be carried out because there is no name for the concept (the tenor or, in conceptual terms, the target), or to extend the meaning (or rather the associated commonplaces) of the tenor and the vehicle (or source) (Black 1955). Metaphors are indeed regarded as instruments that bring about a conceptual reorganization, extending the boundaries of a concept (Leech 1981) or, more generally, structuring and reorganizing it so that we understand an experience in terms of another (Fauconnier and Turner 2003; Jaszczolt 2002; Lakoff and Johnson 1980).

Metaphors have been analyzed within the tradition of philosophy of language as having (among others) two fundamental purposes in communication (Jaszczolt 2002), namely explaining and theorizing. While explanatory metaphors make a

concept or issue easier to understand, "constitutive" metaphors are part of the development of a theory concerning an issue (Ungerer and Schmid 2006). In the former case, metaphors summarize a way of thinking about a phenomenon, or provide a new way of looking at it. In the latter case, metaphors bring to light (and thus select) semantic or connotative aspects of the tenor, so that a certain concept can be understood by someone who is not familiar with it.

The explanatory function of metaphors has been studied in contexts characterized by "epistemic imbalance," i.e. contexts in which the interlocutors have different knowledge schemas about a subject matter. In specialist-layperson communication, metaphors have been described in terms of "scaffolds" taken from better-known domains, on which to build an understanding of the topic domain (Allbritton 1995). Thus, the knowledge of a more familiar field of experience is projected on the domain that can be expected to be less known or more technical (Deignan 2005: 16). For example, to explain why self-management is so important in the context of diabetes care, the "high levels of glycaemia affecting people with diabetes" are referred to in terms of *pollutants* into the blood that need to be kept under control. By framing the conceptual domain of *diabetes* in terms of the more familiar conceptual domain of *pollution*, the knowledge of some specific characteristics of the latter domain (such as the negative effects, the risks, and causes of pollution) are projected onto the former, thus contributing to explain relevant information about diabetes (Rossi 2016). This dimension of metaphor has clearly a negative side, related to its selectivity. On the one hand, by highlighting some properties of the target domain, metaphors can hide other aspects that can be relevant. On the other hand, metaphors create similarities that result in "emergent meanings not directly limited to speakers' or writers' communicative intentions" (Gibbs 1992: 587). For example, a patient can understand that glycaemia is a substance that is *only* dangerous to the body, and external to it.

These two generic communicative functions of metaphor provide a very general distinction, which needs to be further analyzed. In particular, an explanation can be defined as a transference of understanding from one party to the other (Walton 2007), which contributes to the achievement of the collective goal of the dialogue. In this sense, an explanation can be aimed at sharing knowledge or pursuing distinct dialogical goals, such as deciding, persuading, discovering or testing new hypotheses, etc. (Macagno and Rossi 2021). From this perspective, the explanatory function of metaphors needs to be conceptualized in a dialogical perspective by considering the goals that it is intended to serve, such as explaining, summarizing, supporting a viewpoint, illustrating, clarifying, persuading (Cameron 2003; Goatly 2011; Semino 2008), or conveying an evaluation (Deignan 2010).

In the context of healthcare, the use of metaphors has been also associated with a positive assessment of the providers' communication skill (Casarett 2010) and specific metaphors have been used as educational tools to facilitate understanding,

engage patients and increase their self-management abilities (Naik et al. 2011; for a review of the main findings in the context of mental and physical health see Tay 2016 and Demjén and Semino 2016). Few studies have also suggested that metaphors may be used as tools to improve patient understanding and foster their self-management skills (Bleakley 2017; Ervas et al. 2016; Semino et al. 2018). However, it remains unclear how to distinguish and capture the different purposes that can be pursued in a dialogue. To address this problem, we introduce our analytical approach (see Section 3.2 below) based on the concept of dialogue move, which is intended to capture the dialogical dimension of metaphor use.

3 Methods

3.1 Corpus description: patients' and healthcare providers' characteristics

We detected metaphors and analyzed their dialogical distribution in a corpus of medical interviews between Type 2 diabetes patients and healthcare providers recorded from March 2012 through March 2014 in the diabetes outpatient clinic of the Azienda Ospedaliera Istituti Clinici di Perfezionamento di Milano (A.O.I.C.P.), Italy (Bigi 2014). The Ethical Committee of the I.C.P approved the protocol in January 2012. Written informed consent was obtained from all participants (Bigi 2014).

Our sample consists of 39 consultations with 11 Italian patients affected by Type 2 diabetes mellitus. The characteristics of the patients and healthcare providers are described in Table 1. At the time the data was collected, the healthcare team only consisted of women providers. The number of recordings per participant varies both relative to the patients (mean 3.5; range 2–6) and healthcare providers (mean 6.5; range 1–11). Overall, we looked at 21 (54%) interviews with nurses, 14 (36%) interviews with physicians and 4 (10%) interviews with the dietician (Table 1).

Table 1: Patients and healthcare providers characteristics.

Patients (*N* = 11)	
Female	*N* = 6
Total number of visits with female	*N* = 20
Healthcare providers (*N* = 6)	
Female	*N* = 6
Nurse	*N* = 2
Physician	*N* = 3
Dietician	*N* = 1

3.2 Analytical framework

3.2.1 Coding dialogical goals

To understand how and why metaphors are dialogically used within our corpus of medical interviews we have used the coding scheme developed within the MEthod for Dialogue Analysis (MEDA), an analytical framework for the analysis of dialogue (Macagno and Bigi 2017, 2018). MEDA (1) assumes that it is possible to identify and describe individual dialogical intentions in conversations, i.e. what the interlocutors want to do with their utterances to achieve a joint communicative goal; (2) takes as the minimal units of analysis dialogical moves, defined as individual dialogical intentions that correspond with the realization of the higher-level communicative function of the overall discourse; and (3) provides a description of the dialogical organization of a conversation, systematic dialogical patterns and suboptimal realizations of specific dialogical intentions (Macagno and Bigi 2017).

From a theoretical perspective, MEDA combines the top-down approach of the model of types of dialogue (Walton 1989) with a bottom-up approach that takes into account how the general moves can be manifested in a specific context. Combining insights from pragmatics and argumentation theory, this method is based on the notion of dialogue types, translating them into categories of joint dialogical intentions, and transforming sequential joint intentions into proposals of dialogical activities (Macagno and Bigi 2017). In argumentation theory, the generic goal-oriented types of dialogical interactions that the interlocutors can pursue and negotiate have been classified in "types" of dialogue, which are distinguished based on the types of obligations and relations that moves in a dialogue can create (Macagno 2008; Walton 1989; Walton and Krabbe 1995). The joint purposes of a dialogue, namely the interlocutors' generic "we-intentions" when pursuing a joint activity (Searle 2002), were classified by Walton in seven "types of dialogue," namely persuasion, negotiation, inquiry, discovery, deliberation, information seeking, and eristic (Macagno 2008; Walton 1989, 2010). These "types of dialogues" are macro-categories, which include entire sequences of a dialogue and can be made up of several smaller units, i.e., the dialogue moves.

In order to analyze in depth the construction of dialogues and how higher-order pragmatic intentions are expressed through the utterances performed by the speakers, the types of dialogue described by Walton (1989, 2010) were used as the general framework for distinguishing the types of dialogue moves

according to the dialogical inputs (initial situation) and output conditions (the proposed goal of the dialogue and the speaker's goals) (Macagno and Bigi 2017, 2018). It is worth noting that dialogue moves are general categories that can be used to capture different aspects of communication and be adapted to specific contexts (Chiang and Grant 2019; Macagno and Bigi 2020; Rapanta and Christodoulou 2019).

In the context of medical interviews, the dialogue moves were adapted to the specific purpose of a clinical consultation in the context of diabetes care (Macagno and Bigi 2020). From a communicative point of view, these types of dialogue are characterized by the goal of making a reasoned and grounded decision about one or more aspects of a patient's health condition, which needs to be useful for the better management of the disease, achievable by the patient, and (ideally, at least) acceptable or rather based on patient's preferences. Therefore, the fundamental communicative purposes in deliberation are: to acquire and provide information, to discuss the reasons why a certain behaviour is acceptable or not, to co-construct preferences in view of a decision. These communicative goals characterizing chronic care encounters correspond to three relevant types of dialogical moves: a) information-sharing; b) proposal; and c) persuasion. These moves can be further specified considering some elements relevant for the interaction.

The lacking information that can be sought for or provided by either the patient or the healthcare provider can be classified according to its relationship with the overall goal of the interaction: some information is potentially related to patient care (essential), while other information is accessory (contributing) to patient care, namely concerning the administrative aspects of the management of a disease. For instance, requesting or providing clinical data, information about a disease or treatment, or information concerning patients' eating habits can be regarded to be the main goal of the interaction (making a reasonable decision based on patients' preferences). In contrast, information about how to make an appointment for a medical interview, how to withdraw drugs or medical material, or how to use an instrument concern the consequences of a decision already made (category of *procedural information*). The first category of information can be further specified in two subgroups according to its content: *personal information*, which includes information about what a patient eats, how they behave, or their habits, and *clinical information*, namely medical evidence such as the results of medical assessments or controls.

Proposal (deliberation) moves are characterized by plans, and the interlocutors propose and balance the pros and cons of a possible course of action, assessing its possible consequences based on their values and preferences. In chronic care interviews, proposals can concern either "essential" (patient care, or *clinical*) or accessory (*procedural*) plans. For example, when the doctor proposes to

increase the dose of insulin, reduce the amount of pasta that the patient usually eats during the day, or increase the time he or she devotes to exercising, these proposals are directly related to the main goal of the dialogue. In contrast, when a provider suggests the patient about reserving the next appointment immediately or using a certain instrument, the proposals made concern the consequences or the requirements of a decision. Both in the case of information sharing and proposal, the category of "accessory" moves simply indicates their indirect relationship with the main goal of the interview.

Using this analytical framework, we used seven coding categories for the analysis of dialogue moves: 1 – information sharing personal, 2 – information sharing procedural, 3 – information sharing clinical, 4 – clinical proposal, 5 – procedural proposal, and 6 – persuasion. Table 2 provides a brief description of these categories. MEDA categories are defined by combining dialogical intentions with macro-topics in a conversation. Where it is relevant to capture the peculiarities of the communicative context under consideration we have distinguished between dialogical intentions and specific macro-topics. Dialogically irrelevant moves have been considered as "Other" category (7) (Table 2).

Table 2: MEDA categories used for the analysis of the medical interviews.

Category	Dialogical intention	Topic	Code
Information sharing	Exchange of information on specific macro-topics	**Personal** (e.g., patient's personal life, habits, preferences, beliefs, emotions; includes rapport building)	1
		Procedural (e.g., calendar, medical exams; administrative issues; technical issues, …)	2
		Clinical (e.g., symptoms; biomedical parameters; prescriptions of clinical exams, …)	3
Proposal	Moves expressing recommendations, proposals, agreement with and/or refusal of proposal, counter-proposal	**Clinical** (e.g., symptoms; biomedical parameters; prescriptions of clinical exams, …)	4
		Procedural (e.g., calendar, medical exams; administrative issues; technical issues, …)	5
Persuasion	Arguments in support of or against the desirability, reasonableness or acceptability of an opinion or behavior		6
Other	Any move that is dialogically irrelevant to the purpose of the consultation		7

To calculate the interrater reliability, we read all the 39 verbatim interview transcripts. Every interview was codified autonomously by two independent coders. The first 19 interviews were codified by S.B. and F.M. The remaining interviews ($N = 20$) were codified both by S.B. and M.G.R. One coder (S.B.) thus was responsible to codify all the 39 interviews. The interrater reliability was strong with 88.6% of agreement and a Krippendorff's $\alpha = 0.864$ between S.B. and F.M. Very strong results have been obtained also between S.B. and M.G.R., with 92.2% of agreement and a Krippendorff's $\alpha = 0.905$.

3.2.2 Analytical procedure: detecting metaphors and metaphorical utterances

The metaphors used by the patients and the providers in our corpus have been manually identified. The procedure for metaphor identification was developed, following the Metaphor Identification Procedure (MIP) guidelines (Pragglejaz Group 2007), which was adapted to the specific issues characterizing the present corpus. This procedure was implemented to identify the words that were metaphorically used; no assumption was made about whether the speakers intended to use those words metaphorically. The most important steps that we followed are indicated below (Pragglejaz Group 2007: 3):

1. The coders – familiar with both the subject matter and the type of communication – read the whole corpus of transcripts without performing any coding. This step is necessary for familiarizing with the lexical choices of the healthcare providers and the patients.
2. The coders determine the lexical units in the text.
3. The coders determine the difference between the contextual and the basic meaning of the lexical units. For each unit they:
    a. establish its meaning in context
    b. determine whether the lexical unit has a more basic contemporary meaning in other contexts than the one in the given context (basic meanings tend to be more concrete, precise, historically older, etc.)
    c. If the lexical unit has a more basic current meaning in other contexts than the given context, decide whether the contextual meaning contrasts with the basic meaning but can be understood in comparison with it.
4. If yes, mark the lexical unit as metaphorical.

These steps were considered as general guidelines. In the case of doubt, the determination of the "basic" meaning and the conventionality of the contextual use were based on two heuristics. First, the contextual meaning of an expression

was checked on the De Mauro dictionary:[1] even though dictionaries are not sufficient tools for the determination of common meaning (Deignan 2005; Semino 2008), they can provide easy detection of the "pure" idioms or the historically older uses (Deignan 2005). So, if the contextual meaning of an expression is entered in the dictionary as idiomatic or as a reported usage, it is not marked as metaphorical. If the dictionary already reports the use as figurative, and it is based on a metaphorical transfer, it is marked as metaphorical (Semino et al. 2016). Second, the contextual use is assessed through the corpus linguistics software Sketch Engine.7 (Kilgarriff et al. 2014), which provides an integrated standard Italian corpus of 4.9 billion words (*Italian Web 2016*).[2] If the concordance does not report occurrences, or if the count is extremely low, the expression can be considered as a candidate for an innovative metaphor.

Two problems arise in our specific corpus, characterized by the specific subject matter and the institutional context (diabetes care), and the regional varieties of Italian. First, the contextual uses of some expressions (such as "profile" to indicate a series of glycaemia tests that need to be done before and after a meal) are idiomatic in a specific chronic care community, but they cannot be found in the corpus (for example, this use is not found in the aforementioned corpus, even though "inflammatory profile" is recorded). In this case, if the contextual meaning of the lexical item in our corpus does not correspond to the basic one or the common uses, it is presumed as an instance of potential non-idiomaticity. For example, "profile" is commonly used to refer to the outline of physical entities (buildings, people, etc.) or behaviours, but not to a scheme of measurement. For this reason, since the contextual meaning can be understood in comparison with the basic meaning, it is marked as metaphorical.

The second problem concerns regional or slang expressions. For example, the use of the expression "fregarsi" (to rub oneself) to mean "to fool oneself" is a metaphorical use vis-à-vis the basic meaning. However, it is both frequent in the concordance and is reported as slang by the De Mauro dictionary. For this reason, it is not marked as a metaphor. Regional variants are also excluded from the metaphorical count. For example, the verb "aggeggiare" is not reported as an Italian lexeme and has only 24 occurrences in the corpus. However, it is a regional (Tuscan) verbal derivation from "aggeggio" (thing) to mean "to fix something," which is included in the De Mauro dictionary.

This procedure was followed by two blind coders who coded the whole corpus, as a way of detecting the metaphorical expressions. The interrater reliability was strong with 89.9% of agreement and a Krippendorff's α = 0.768. The disagreements

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1 https://dizionario.internazionale.it/.

2 https://www.sketchengine.eu/ittenten-italian-corpus/.

were discussed and resolved between the coders. In this study, and as defined in Section 3.2.2 above, the occurrence of a metaphorical expression identifies a move – a sequence in which more than one metaphorical expression can occur.

3.2.2.1 Detecting the subject matter of metaphors

The last methodological aspect of our research concerns the analysis of the subject matter that metaphors are used to address. We have first distinguished the topics relevant to the global topic of diabetes and patients' health conditions from the ones not directly related to the goal or the context of the consultation (such as formalities or comments on third parties not related to the consultation). The relevant topics were divided in to six categories: symptoms, measurements, lifestyle, medical concepts, clinical tests, and self-monitoring. The specific description of these thematic classes is given in Table 3.

Table 3: Description of the thematic categories.

Thematic categories	Description
Symptoms	Body signal that is not measured through medical instruments, including sensations, pain, feelings, conditions.
Measurements	Reports and assessments of measurements, including the evaluation of a measure considering the overall trend of the patient, the past values, or the values considered as normal. It also refers to adaptations of drugs to health indicators.
Lifestyle	Behaviors that are directly or indirectly related to the interview, including dietary choices and regime, exercise, familiar issues relevant to diabetes control.
Medical concepts	Explanations of medical terms or concepts and relationship between variables, such as between glycaemia values and behaviors or drugs.
Clinical tests	All the tests or procedures that are performed in medical facilities and that are related directly or indirectly with the patient's condition (including not only routine eye or other diabetes-related controls, but also other health tests or surgeries).
Self-monitoring	The procedure of measuring the levels of glycaemia performed by the patient and other tests that patients routinely carry out.

The metaphors have been classified as shown above based on their specific meaning and not on the subject matter of the move. For example, a metaphor describing or referring to a habit (lifestyle) can be included in a move that describes or reports a measurement (measurement). In this case, the metaphor has been coded as belonging to the thematic category of lifestyle.

4 Quantitative results

4.1 Distribution of dialogue moves

By using the MEDA, we have codified 15,246 dialogue moves. Table 4 provides a detailed distribution of the moves within each coding category. We found that 64% of the codified moves were related to information sharing exchanges. Overall, the percentage of the proposal and persuasion moves – those concerning the deliberation exchanges aimed at deciding or accepting a specific point of view – was 26%.

Table 4: Types of dialogue moves in the Italian corpus of medical interviews.

Code	Category		N. of moves
1	Information sharing personal	2,696 (18%)	9,713 (64%)
2	Information sharing procedural	2,693 (18%)	
3	Information sharing clinical	4,324 (28%)	
4	Clinical proposal	1,422 (9%)	3,990 (26%)
5	Procedural proposal	1843 (12%)	
6	Persuasion	725 (5%)	
7	Other	1,543 (10%)	

4.2 Distribution of metaphorical tokens

Table 5 shows the distribution of metaphorical tokens according to their type (conventional vs. creative) and the type of move in which they occur. We have found 33 (almost 4%) creative metaphorical expressions (those in which contextual meanings do not correspond to the basic meaning, and have no or very little representation in the corpus, see Deignan 2005), most metaphors being conventional ones. The rightmost column gives figures and percentage of metaphors we detected in each respective dialogue move category. Overall, our analysis includes 850 metaphors, identified in 5.6% of the dialogue moves we have codified with the MEDA. The findings related to the distribution of metaphors within persuasion moves ($N = 122$) show that they are used within a context with a persuasive dialogical intention in 14.3% of cases.

Table 5: Distribution of conventional and creative metaphors in MEDA categories.

Code	Category	N. of conventional metaphors	N. of creative metaphors	Tot N. of metaphors	Frequency of metaphors per total number of moves
1	Information sharing personal	207	11	218	8.1%
2	Information sharing procedural	54	5	59	2.2%
3	Information sharing clinical	275	12	287	6.6%
4	Clinical proposal	108	1	109	7.7%
5	Procedural proposal	47	0	47	2.6%
6	Persuasion	100	4	104	14.3%
7	Other	26	0	26	1.7%
Total		817	33	850	5.6%

From a methodological point of view, this type of analysis is based on two independent coding procedures, namely the detection of the communicative purposes (MEDA) and the identification of the metaphors used being conducted separately at two different stages. This procedure allowed us to automatically link the communicative purpose of a metaphor to the type of dialogue move within which that metaphor was found. For example, if in the first stage a move (1) was coded as having a specific communicative purpose (e.g. a persuasion move) and in the second stage a metaphor was detected in (1), then the metaphor was attributed the same communicative purpose of (1) (e.g. a metaphor used for persuasive purposes).

The detection of the conversational goals of metaphors can shed light on the possible preferential uses of metaphors in a specific conversational setting. In our corpus of diabetes care interviews, the most frequent communicative purpose was found to be the exchange of information, with 9,713 moves codified (64%). Within this general category, the class of clinical information sharing (code 3) is the most represented (4,324 moves: 28%). The sum of clinical proposal, procedural proposal, and persuasion provides an outline of the structure of the deliberation exchanges within the corpus, with 3,990 moves codified (26%). This distribution of moves can show how metaphors are used in this specific type of medical encounter. From a quantitative point of view, procedural moves (codes 2 and 5) have the lowest percentages, while metaphors used for persuasive purposes show the highest frequency.

4.3 Distribution of metaphors – interlocutors' strategies

The results obtained thus far led to analyzing the differences between the providers and the patients in their use of metaphors. Overall, the providers use a significantly higher number of metaphors than the patients ($\chi^2(6)$ = 9.5 p = 0.002, significant at $p < 0.05$). The providers used 488 metaphors, corresponding to a frequency of metaphor per move of 6.1%, while the patients used 362 metaphors, equal to a frequency of 5% metaphors per move. To assess the different distributions of metaphors between the two populations considering each type of dialogue move, we conducted a paired-samples non-parametric test (Wilcoxon) for each type of move (Table 6).

Table 6: Frequencies of metaphors per type of dialogue move.

		Role			
		Healthcare Provider		Patient	
		Count	Frequency	Count	Frequency
Type of dialogue move	Information sharing personal	41	3.45%	177	11.73%
	Information sharing procedural	39	2.77%	20	1.56%
	Information sharing clinical	169	7.56%	118	5.65%
	Clinical proposal	97	12.08%	12	1.94%
	Procedural proposal	39	3.82%	8	0.97%
	Persuasion	93	17.06%	11	6.11%
	Other	10	1.30%	16	2.08%

The Wilcoxon non-parametric test comparison of the providers' and the patients' metaphors yielded significant results for the following dialogue move types, in descending degrees of significance: information sharing personal (z = 7.8243, $p < 0.001$); clinical proposal (z = 7.1268, $p < 0.001$); procedural proposal (z = 3.8533, $p < 0.001$); persuasion (z = 3.6348, $p < 0.001$); information sharing clinical (z = 2.525, p = 0.0114); and information sharing procedural (z = 2.1486, p = 0.03156). No significant difference was observed for the category of other moves.[3] The

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3 The use of metaphorical moves (as distinguished from metaphors) in the two populations significantly differs ($p < 0.001$) for the following dialogue moves: information sharing personal (z = 7.8215), clinical proposal (z = 6.0985), procedural proposal (z = 3.3702), and persuasion (z = 2. 8117). The difference between the other three types of metaphorical moves in the two populations is not significant. The patients performed 331 metaphorical moves, while the providers 397. Each metaphorical move may involve the use of more than one metaphor.

different frequencies of metaphors per type of move are reported graphically in Figure 1, while Figure 2 represents the count of the metaphors per category.

These distributions show how the patients and the providers use preferential metaphors for distinct purposes. While the providers tend to use metaphors to propose recommendations or support a proposal or viewpoint (89% of metaphors in both persuasion and clinical procedure moves, and 83% of metaphors in procedural proposal moves are performed by the providers), the patients tend to use metaphors mostly for sharing personal information (81% of metaphors used for this purpose are performed by the patients). The patients tend to use significantly more metaphors than the providers when sharing personal information; the providers opt for using more metaphors in making proposals and especially persuading, which is significantly more than the patients do.

4.4 Metaphors and thematic categories

The subject matter in which metaphors are most frequently used is lifestyle, namely issues related to diet and exercise (representing more than 26% of the total metaphors
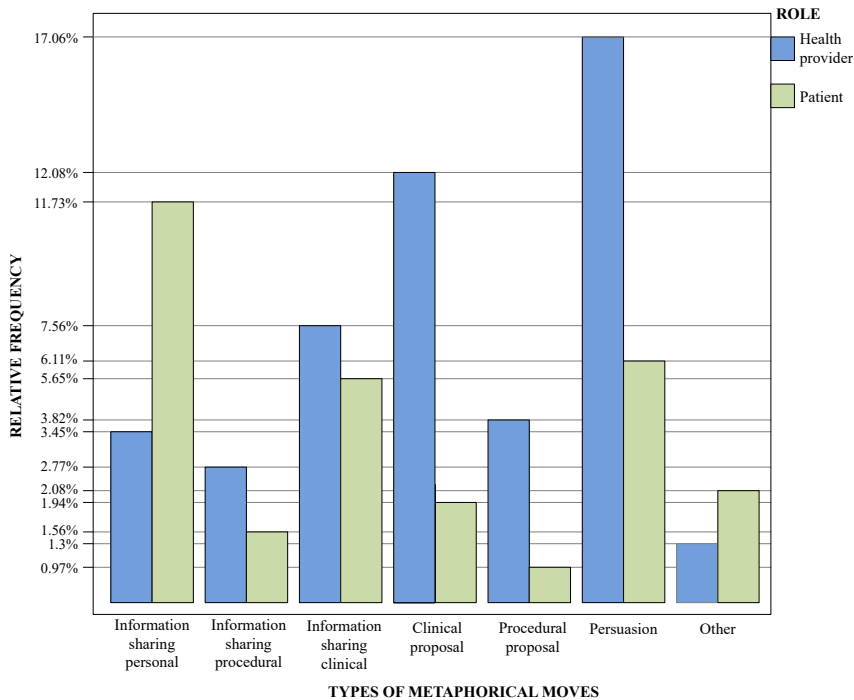

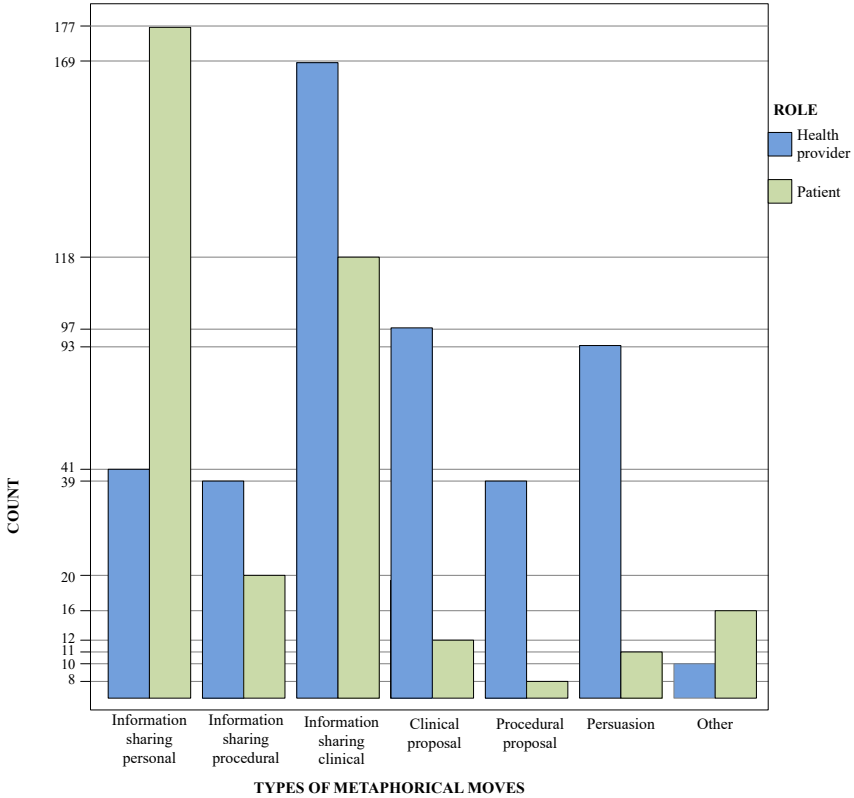**Figure 1:** Interlocutors' dialogical goals in using metaphors.

Figure 2: Count of the metaphors per category of dialogical move.

used), followed by self-monitoring (20%), symptoms (16%), measures (14%), and medical concepts and relations (12%). The distributions of the metaphors relative to their subject matter between the two populations were found to be significantly different $\chi^2(6) = 69.2$ $p < 0.001$, Phi: 0.285 (medium effect size) (Figure 3).

Concerning the overall use of metaphors, the patients use fewer metaphors than the providers (362 vs. 488). We notice that while more than 22% of the patients' metaphors concern symptoms (vs. 11% of the providers'), the proportions are completely reversed when the dialogue concerns medical concepts and relationships (15% of the providers' metaphors vs. 8% of the patients') and issues related to self-monitoring (25% of the providers' metaphors vs. 14% of the patients'). The last significant difference concerns metaphors used for talking about lifestyle topics. While the patients use more than 35% of their metaphors to address these issues, the providers use metaphors in a much lower frequency (20%).
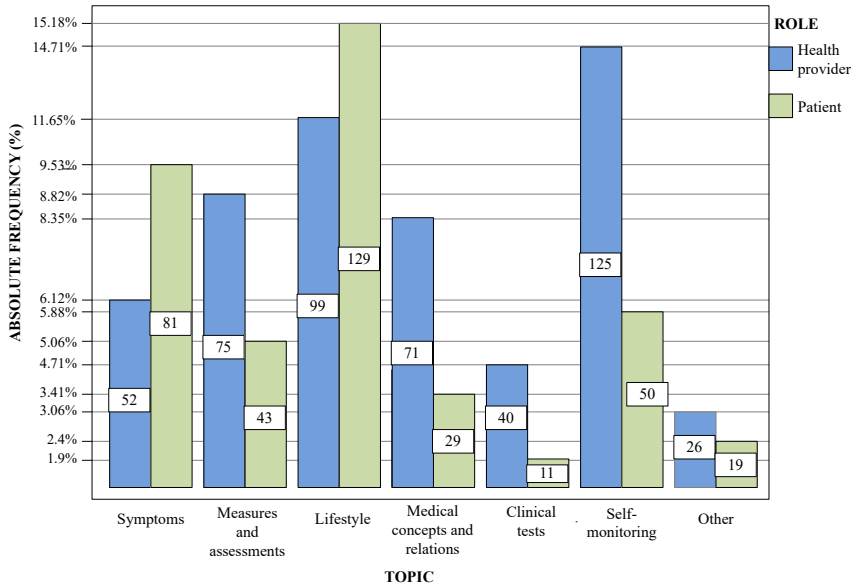
Figure 3: Distributions of metaphors by subject matter and role.

5 Qualitative analysis

The quantitative findings show how the patients in our corpus tend to use metaphors for communicating concepts related to three basic thematic categories, namely lifestyle, symptoms, and measurements. In contrast, the providers use more metaphors that are more distributed among the thematic areas, but they tend to use more metaphors when the subject matter concerns medical concepts and relations, lifestyle, self-monitoring, and measures. These tendencies can be matched with the trends observed in the preferential uses of metaphors (codified in terms of different dialogue moves). By pointing out how the significant metaphorical thematic areas are used dialogically, it is possible to provide a more detailed outline of the interlocutors' communicative uses of metaphors.

The patients tend to use metaphors mostly for:

a) *sharing* the *symptoms* of their condition. Symptom metaphors ($N = 49$) are used within information sharing personal moves, which amounts to 60% of the patients' symptom metaphors and 13.5% of total metaphors used by the patients; and

b) *reporting* their *lifestyle* habits. Lifestyle metaphors ($N = 78$) are used within information sharing personal moves, which amounts to 60.4% of the patients' lifestyle metaphors and 21.5% of the total metaphors used by the patients.

In contrast, the providers tend to use metaphors for:

a) sharing clinical information about *symptoms* (77% of the doctor's metaphors ($N = 40$) concerning symptoms are for informing or requesting clinical information;

b) making medical proposals or justifying a decision based on *medical concepts* and explaining them. 29.5% of medical concept metaphors ($N = 21$) are used within information sharing clinical moves, 15.2% ($N = 19$) within persuasion moves, and 8.5% ($N = 6$) within clinical proposal moves;

c) requesting information and making and justifying proposals concerning the patient's *lifestyle*. 35.3% of lifestyle-related metaphors ($N = 35$) are used within clinical proposal moves, 19.2% ($N = 19$) within information sharing personal moves, and 16.6% ($N = 16$) within persuasion moves;

d) making and justifying proposals related to *self-monitoring*. 28% of self-monitoring related metaphors ($N = 35$) are used in clinical proposal moves and 22.4% ($N = 28$) in persuasion moves;

e) sharing clinical information and persuading the patient on topics concerning *measurements*. 52% of measurement-related metaphors ($N = 39$) are used within information sharing clinical moves and 15.5% ($N = 11$) within clinical proposal moves.

In general, 30% of the providers' metaphors used in persuasion moves concern self-monitoring issues, followed by medical concepts (20%).

The different distributions of topics and purposes of metaphors indicate the pursuance of different strategies. The results suggest that metaphors are the instruments preferentially used by the patients for expressing concepts related to medical issues or physical conditions. Considering the age and level of education of the population in our corpus, metaphors appear to be crucial for bridging epistemic or intercultural gaps (often the patients do not know how to express a physical sensation or a health condition).

The metaphors used by the providers mirror a different tendency. Medical concepts are made more familiar and accessible through metaphors, which are also used for persuading the interlocutor to modify his or her lifestyle or habits. However, these findings underline another aspect of metaphor use, namely the risk of vagueness. The providers' metaphors used for sharing information or making a proposal concerning self-monitoring (such as the most frequent metaphors in this category, namely "profile," "discourse," and "arrive") characterize a medical jargon that may refer to precise concepts for the providers. Such terms seem to be interpreted vaguely by the patients and thus lose their precision. In this sense, such metaphors can lead to misunderstanding or poor understanding of the communicated concepts (Rossi and Macagno 2020; Macagno and Rossi 2019).

The providers' most frequent metaphors used for assessing and reporting measurements (for example, "ugly," "beautiful," "jump," "blow") are also characterized by vagueness. These metaphorical uses are however noticeably different from the self-monitoring ones. Here, metaphors are used mostly for providing the patient with an interpretation of numeric data (measures), and thus for sharing clinical information in a way accessible to the patient and strategic for the provider. The vague and value-laden metaphorical assessments or interpretations of measures can be directly or indirectly used for developing the premises of further communicative steps, such as an argument or a proposal. In this sense, they can be considered implicitly argumentative.

The trends emerging from our quantitative analysis can be interpreted by considering some illustrative examples (in all examples, the original texts are provided in square brackets; the metaphorical expressions are underlined). The most evident trend in both the patients' and the providers' metaphor use is requesting and sharing information about symptoms. The providers use metaphors for relating more complex symptoms to images or representations that the patients can easily recognize, to collect clinical information about the evolution of their disease.

(1)   Nurse: Put your feet up, so that we can examine them. Have you got any annoying sensations such as tingling, burning feeling, spasms? Sensations like pins are stinging you?
       [Su i piedi che li guardiamo. Disturbi come formicolii, bruciori, crampi? Sensazioni che ci siano degli spilli che la pungono?]

Here metaphors are used to refer in a general but comprehensible way to symptoms that correspond to clinical values (such as the elasticity of the skin) or specific health conditions (such as dizziness caused by the decrease of glycemic values). These metaphors allow identifying, very broadly, clinical symptoms useful for diagnosis and treatment.

The patients use metaphors to share information related to the way they feel their body functions, namely, to convey to the doctor aspects of their personal life that *can* have clinical relevance. The following are illustrative examples.

(2)   I mean, I will tell you, in this time I am a bit messed up, a bit also in my head, let us say that I am not regular, so I have skipped writing, eh no, the pills always.
       [Cioè, le dirò che questo periodo sono un po' sballata un po' anche di testa diciamo non sono regolare quindi ho saltato di scri- no eh le pastiglie sempre]

(3)   I have one – well, I do not know whether it depends on diabetes. For example, if I only walk up one flight of stairs, not very long, well my legs::: -

well they get <u>paralyzed</u>, I:: - how can I put it, I have got <u>pins and needles (in Italian: ants)</u> in all my legs. That is, they take me, and I have got <u>pins and needles (in Italian: ants)</u> in all my legs as if:: - that is, I cannot walk up two flights of stairs, or if I go hiking on a mountain, for example, I walk a bit and then my legs are <u>sawn off</u>, I say, that is, they do not <u>go</u>.

[Io ho una- cioè non lo so se dipende dal diabete. per esempio se faccio anche solo una rampa di scale non lunga, cioè ho le gambe:::- cioè mi si <u>paralizzano</u> le gambe, mi::- come posso dire. cioè mi- mi- mi::- mi si<u>informicolano</u> tutte. cioè mi <u>prendono</u> e mi <u>informicolano</u> tutte le gambe come se:::- cioè mi- no-n non ce la faccio a fare due rampe. o se vado in montagna per esempio, faccio un pezzetto e poi ho le gambe che mi si- le <u>gambe tronche</u>, dico io. cioè- che non <u>vanno</u>.]

(4)   Yes, no no no, I <u>fall down</u>.
       [Sì, no no no, <u>vado per terra</u>]

Examples 2–4 represent symptom-related metaphors that are used to report and share physical sensations. The patient in (2) cannot refer to her unusual state of mental confusion using more precise descriptions, so he relies on a slang concept denoting excitement ("*sballare*"). The patient in (3) describes a specific sensation of pain in the legs with the image of swelling. The patient in (4) refers to her state of dizziness as the sensation of falling to the ground.

    Persuasive moves are the ones that are characterized by the highest frequency (14.3%) of metaphors. The use of metaphors for persuasive purposes is one of the strategies that define the healthcare providers' communication. A clear example is Example 5 below, in which the physician is trying to persuade the patient that keeping the blood pressure low (by measuring it) is a good way to prevent future problems usually correlated with wide blood pressure fluctuations. To this purpose, she advances the following move.

(5)   Physician: If I know that my blood pressure is, let's say, <u>dancing</u>, I measure it.
       [Se io so di avere la pressione diciamo <u>ballerina</u>, me la misuro].

The metaphor here concerns the thematic category of assessment of *measures*, as it concerns a trend of measures related to a physical condition (blood pressure). This metaphor is used to express a reason for persuading the patient to measure the blood pressure more often – it works as a condensed argument in favour of a specific behaviour. The Italian word "ballerina" (dancing), an adjectivization of the noun "ballerina" (dancer), is figuratively used to describe unstable, dangerous, and fluctuating movements also in other contexts (e.g. "terra ballerina:" dancing land,

when referring to earthquakes).[4] The metaphor has a twofold use. On the one hand, it makes accessible a concept that could be more complex to understand by the patient, as "dancing" can be more easily related to irregularities in blood pressures. On the other hand, the metaphor is not neutral but expresses a value judgment on the fluctuating values. This example shows how metaphors expressing value-laden interpretations of clinical measures or trends can be used to lead the interlocutor to act in a specific way. The reason is not explicitly advanced by the provider, but it is rather left unexpressed in assessing metaphorically the patient's values of blood pressure, associating them with a concept that evokes a potential risk and danger.

The persuasive purpose of a provider's move can be pursued through the metaphorical explanation of a *medical concept*. Metaphors can be extremely effective in conveying and making familiar to the patient important educational contents related to functioning and self-managing of diabetes. In Example 6, the dietician is justifying the advice of keeping healthy habits also on vacation, as diabetes can worsen. However, instead of showing how small variations in diet can impact health conditions, she uses a series of metaphors to represent the unreasonableness of patients' reasoning.

(6)　　Dietician: when you go on vacation, you <u>carry</u> the diabetes with you, you don't <u>lock</u> your diabetes in Milan when you leave. Diabetes <u>stays</u> with you. *[Quando si va in ferie il diabete <u>si porta dietro</u>, non si <u>chiude</u> a Milano e si parte. <u>Rimane</u> con lei.]*

Here, the metaphors convey *medical concepts*, but not in a restricted sense. They express premises that are not challengeable by the patient unless he accepts to be committed to nonsense.

The other thematic category of metaphors frequently used for persuasive purposes is *self-monitoring*.

(7)　　Nurse: For a person who works, I understand that it is more complex. However, we need to do it like I say, a bit <u>more reasoned</u>, as I can <u>start off with</u> a good value, but what happens after I eat?

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4 To assess this hypothesis, a corpus linguistic package, Sketch Engine.7 was used to perform a quantitative investigation of a corpus (in this case, the Italian corpus available in the software plus an additional corpus obtained through a manual search on Google using the key phrase "*è ballerina/a*" (to be dancing) in the construction copula + adjective phrase). 106 occurrences in total were found, of which 40 are used descriptively to indicate instability (the light is dancing; the Earth is dancing…) and thus are argumentatively neutral, while all the remaining 66 occurrences are argumentatively used to trigger a negative evaluation (see Macagno 2020).

> *[Una persona anche che lavora mi rendo conto che è più complicato. Però dobbiamo come dico io farlo un pochino <u>più ragionato</u>, per cui io posso <u>partire</u> con un buon valore, ma cosa succede dopo che io ho mangiato?]*

The two metaphors are used to express two principles of *self-monitoring*, namely a specific regularity in testing a patient's values ("reasoned"), and the comparison between the morning glycemic values with the ones detected after the meals ("start off with"). The first metaphor has a twofold dimension. On the one hand, it is used to express a specific interval and modality in making self-assessments, and if we consider only this communicative goal, this metaphor can result in the risk of making a specific concept vaguer. On the other hand, "reasoned" expresses an argument in favour of a specific assessment procedure, which condemns as confusing or without an organizing principle the one followed by the patient. In this sense, the metaphor itself is an implicit argument.

Several metaphors concerning *self-monitoring* concepts used for persuasive purposes combine a vague (in the sense of non-specific) descriptive content with an evaluative component. This characteristic can be explained as fulfilling a specific communicative strategy, namely providing a general idea of the subject matter – to be understood by interlocutors with little knowledge of medical procedures or concepts – with a clear evaluation to direct their actions.

(8)   Nurse: \<this way of testing the values\> gives us <u>a more complete picture</u>, so that we know also how <u>to intervene</u> with the therapy.
     [È che ci dà <u>un quadro più completo</u> per sapere anche come <u>intervenire</u> con la terapia]

The "more complete picture" refers to the combined trends of measurements taken at specific intervals to modify the therapy accordingly. These metaphors do not explain the exact medical purpose of the series of tests but convey their function (understanding a condition) for a purpose that the patient should already understand and share.

The last relevant thematic area of metaphors used for persuasive purposes is *lifestyle*. Unlike the metaphors above, lifestyle metaphors do not have an additional goal of explaining or simplifying unfamiliar concepts. Rather, they are framing strategies or colloquial expressions conveying specific value judgments. An example is the following.

(9)   Physician: Between <u>becoming Totti</u> \<a famous Italian soccer player\> and working out twice a week there's an infinite number of possibilities.
     [Dal diventare Totti al fare due volte a settimana c'è un'infinità di possibilità tra cui scegliere.]

The metaphor "becoming Totti" is used to frame the interlocutor's reluctance to engage in physical exercise, as unsuited to her age and condition. The hyperbolic metaphor is used to reduce to absurdity the interlocutor's viewpoint, and thus persuade her to enroll in some gym courses.

6 Discussion

Two distinct observations can be made on the findings related to our diabetes care corpus. First, metaphors have been found to serve the goal of sharing or requesting information that would be harder to describe or understand using non-metaphorical language. Thus, when a metaphorical move is aimed at sharing information such as symptoms, the interlocutors tend to pursue the goal of making the subject matter more related to the presumable background knowledge of the interlocutor, sacrificing precision – and incurring possible problems of under-standing (Macagno and Rossi 2019). Second, metaphors are frequently used by healthcare providers as a preferential strategy for persuasive purposes, both directly and indirectly. In addition to the metaphors used in persuasive moves for supporting the desirability of a proposal (a direct and expected use), metaphors are also indirectly used to frame a state of affairs and support persuasively the intended evaluation thereof. Measures are thus presented in a metaphorical and non-neutral way to support a further proposal move; procedures are outlined or referred to metaphorically to point out their unacceptability or unreasonableness; and symptoms are described through vivid images for underscoring their seri-ousness. In these cases, metaphors represent a tradeoff between the informational need and the persuasive goal.

A more specific comment needs to be made about the providers' use of met-aphors for persuasive purposes, which is the category with the highest frequency of metaphors in the providers' talks. The high frequency of the persuasive uses of metaphors mirrors a shared assumption in the literature, which underscores the persuasive effects of figurative language (Burgers et al. 2016; Ervas et al. 2018, 2021; Rossi 2021; Sopory and Dillard 2002; Van Stee 2018). The definition of "persuasion move" refers to an argumentative process, namely advancing arguments or attacks to a viewpoint, or more generally a conclusion, to increase or decrease its acceptability (Walton 1999). These moves are essentially characterized by con-taining arguments, which involve a sequence of natural inferences leading from implicit or explicit premises to an implicit or explicit conclusion. Metaphors can be persuasive because they can elicit an assessment, and more importantly because they can translate a concept into a different system of evaluative criteria.

7 Conclusions

Metaphors have been acknowledged to have several different uses, that is they can be used to pursue distinct dialogical purposes, regardless of whether they are knowingly being used as metaphors as such. However, to our knowledge, no studies have addressed the problem of determining what goals metaphors are used to pursue, and in what proportions. This methodological gap becomes crucial in the context of medical communication, in which metaphors are studied as educational tools. This paper intended to address this methodological problem, showing how different uses of metaphors can be captured and analyzed both quantitatively and qualitatively. To this purpose, a method for analyzing the dialogical uses of metaphors was proposed and illustrated through its application to a corpus of medical interviews in diabetes care.

Metaphors have been analyzed by considering the dialogical functions (goals) of dialogue moves. The MEDA – a method specifically designed to analyze the dialogical structure of verbal interactions – has been applied to determine the goals that metaphorical moves pursue. The quantitative results have been combined with a thematic analysis of the metaphors used. The qualitative findings were used for determining the most common trends in the providers' and the patients' use of metaphors in our corpus of diabetes care. The exploratory study based on this methodology provides some methodological insights into the strategies that can be used for analyzing metaphors in discourse and illustrates the type of studies that can be conducted and the nature of the results that can be obtained. However, some limitations need to be highlighted to avoid unwanted generalizations and misinterpretations. The findings have been obtained through the application of an analytical tool, recently developed both at a theoretical and methodological level, on a corpus that can provide only exploratory results. The distributions and correlations found are limited to a very specific context – diabetes care in a clinic in Northern Italy and a limited corpus – involving a group of specialists who had received adequate training on doctor–patient communication at different stages in their career. Further studies are needed to investigate the same issues in a broader corpus, and in other linguistic and cultural communities to detect similarities and variations. More importantly, these exploratory findings suggest possible directions of research, focused on the issues of metaphor comprehension and the function of metaphor in fostering patient education.

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