Patient Education and Counseling 104 (2021) 308–314

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

Interactional implications of either/or-questions during telephone triage of callers with chest discomfort in out-of-hours primary care: A conversation analysis

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ARTICLE INFO

Article history:
Received 13 May 2020
Received in revised form 10 July 2020
Accepted 12 July 2020

Keywords:
Telephone triage
Out-of-hours primary care
Conversation analysis
Multiple-choice either/or-questions
Chest discomfort
Communication
Telehealth

ABSTRACT

Objective: To explore the interactional implications of either/or-questions on the interaction between people who call out-of-hours services in primary care (OHS-PC) and triage nurses who use a decision support tool called the 'Netherlands Triage Standard' (NTS) during telephone triage.
Methods: A qualitative study of 68 triage conversations at six Dutch OHS-PC. Patients called the OHS-PC with symptoms, e.g. chest discomfort, suggestive of acute coronary syndrome. Using conversation analysis, we identified two categories of multiple-choice either/or-questions that indicated interactional difficulties, shown in hesitation markers within callers' responses.
Results: Our analysis shows that interactional difficulties mainly arise when (i) questions are poorly designed by the triage nurse; or (ii) when the caller's complaints are ambiguously presented reflecting patient's difficulties to verbalize them (e.g. "not feeling well").
Conclusion: The way NTS displays key diagnostic options encourages triage nurses to use multiple-choice either/or-questions. More awareness among triage nurses is needed on undesirable implications of either/or-questions on the interaction.
Practice implications: We recommend changing the NTS display of diagnostic options and to use questions with fewer options in order to decrease the chance of formulating ambiguous questions soliciting unclear responses. Furthermore, asking content questions when complaints are ambiguously formulated may specify the presentation of complaints.

1. Introduction

During telephone triage conversations at out-of-hours services in primary care (OHS-PC) in the Netherlands patients call to share their concerns and ask for medical help outside the office hours of their own general practice [1]. Triage nurses perform telephone triage under supervision of a general practitioner (GP) [1]. The key goal of telephone triage is to identify callers with the most urgent need for care by allocating adequate urgency levels [2]. In order to assign an adequate urgency level, triage nurses in the Netherlands use a computer decision support system called the 'Netherlands Triage System' (NTS) [3]. The NTS consists of mandatory medical topics on which the triage nurses have to ask questions. The mandatory topics are hierarchically ordered [1]; questions about the most critical symptoms and circumstances requiring immediate action are asked first, followed by less critical questions [4]. Besides the mandatory topics, triage nurses may ask optional questions throughout the conversation. Triage nurses fill out the callers' responses in the NTS, which then automatically generates an urgency level linked to a maximum response time by which medical help must be provided [2].

Telephone triage conversations concern a challenging type of interaction, because triage nurses can only use verbal information [4,5]. There is a substantial body of literature on medical institutional interaction [6], the structure of doctor-patient interaction [7–9], and more specifically on primary care encounters between GPs and patients [10]. Yet, studies focusing on triage nurse-caller interaction in OHS-PC settings are scarce. Previous

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https://doi.org/10.1016/j.pec.2020.07.011

analyses from an interactional perspective showed that most medical consultations follow a standard structure consisting of recognizable phases [11,12], however, these are mostly based on doctor-patient interaction where the main goal is to establish a diagnosis. In triage conversations the main institutional goal is urgency allocation. Based on previous international literature on the phase structure of calls to a medical helpline [13,14] and emergency service [15], and a preliminary bottom-up analysis of our data of triage calls between triage nurses and callers, we identified seven phases of telephone triage conversations at the OHS-PC (see Fig. 1).

The process of urgency allocation is mainly shaped by phase three and five, which contain medically relevant questions. As mentioned before, triage nurses have to follow the structure of the NTS, formulate questions, interpret responses, and enter the responses in the NTS, with in the meantime coordinating the conversation. Obviously, this is a difficult interactional challenge [14]. An additional complicating factor for this type of institutional interaction is time; telephone triage should be fast, in order to limit delay of treatment aimed at improving prognosis. Especially for callers with symptoms suggestive of an acute coronary syndrome this is crucial, yet requires great effort as callers can present a wide variety of symptoms, and physical signs are lacking [16–18].

The NTS is set up in such a way that the triage nurse needs to choose between multiple options, with one option leading to a higher urgency than the other(s). During a telephone triage conversation, the NTS proposes possible diagnostic 'main complaints' based on word recognition software; when the triage nurse types information from the caller into a free text field, the NTS responds with possible 'main complaints' from which the triage nurse can choose. By choosing a 'main complaint' a new screen is activated within the NTS, showing the rest of the mandatory triage topics related to that specific 'main complaint'. The topics are listed vertically as keywords (e.g. sweating, nausea, clammy) and have an additional information button. The triage nurse has the possibility to click on this button, after which a short explanation on the topic and a pre-formulated sample question appear (e.g. "Do you feel sweaty or nauseous or clammy?"). In this unique context of telephone triage with the NTS, triage nurses use questions with one or more options. Questions in general can differ in lexical, morphological, syntactic and intonational characteristics [19]. Across cultures and languages these characteristics also differ [20,21]. For the Dutch language there is a categorization of questions focusing on the types of responses questions require: polar questions, content questions and either/or-questions [20]. We adapted this categorization for triage conversations, displayed in Fig. 2 [20–25].

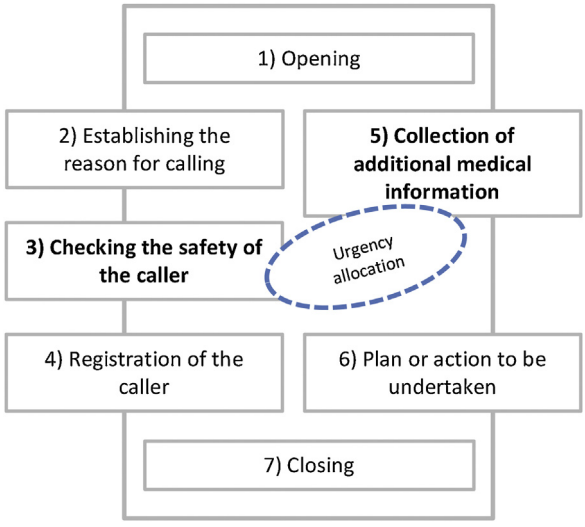

Fig. 1. Phases of telephone triage conversation at the out-of-hours service in primary care (OHS-PC).

A first look at our data revealed that triage nurses often use either/or-questions, which come in different formats: two choice, multiple-choice and tag-format. We noticed friction within the multiple-choice format of 'either/or-questions', category 3b in Fig. 2. On the one hand, multiple-choice questions are easy and fast, because they require an unambiguous response and make a certain type of interactionally 'preferred' response relevant [26]. According to the general principle of preference organisation in interaction, preferred responses (e.g. accepting an invitation) are shown by a quick and direct turn shape, whereas non-preferred responses (e.g. rejecting an invitation) are produced with delay components, such as hesitation makers [26,27]. In case of multiple-choice formatted questions, the preferred response is repeating one of the offered options [20]. A previous conversation analytic study of emergency calls reported that multiple-choice questions were more effective than content questions, as multiple-choice questions helped to align callers to the communicative task of the triage nurse in this interactional context [28]. On the other hand, we observed a lot of hesitation markers such as pauses, filled pauses (e.g. "eh" or "ehm"), reformulations and repairs in response to multiple-choice questions. Hesitation markers are indications of non-preferred responses that take more time [29], which is especially suboptimal in an emergent setting such as telephone triage conversations of people calling with chest discomfort suggestive of acute coronary syndrome. Also, non-preferred responses suggest that the questions were problematic for the caller [26]. Thus, the aim of our study was to explore the implications of multiple-choice either/or-questions on the interaction between people who called the OHS-PC and triage nurses who used the NTS during the calls for triage.

2. Methods

This study is part of a larger project called 'Safety First' paying attention to triage and diagnosis of callers with symptoms suggestive of acute cardiovascular disease in the OHS-PC setting. Details of the design were published elsewhere [30].

We used a random sample of 68 telephone triage conversations of over 2000 recordings of conversations between callers with chest discomfort and triage nurses at Dutch OHS-PCs between 2014 and 2016. Such conversations are routinely recorded and archived for training, quality control, and research purposes. The triage recordings were anonymized in accordance with ethical guidelines and all researchers involved in the data collection and analysis signed a confidentiality agreement. The triage recordings were transcribed verbatim and coded by the authors for the phases and categories of either/or-questions (see Fig. 2). Subsequently, for all transcripts containing either/or-questions we used Jeffersonian conventions for transcription, which makes phonetic information and pacing visible (see Appendix A) [31]. Conversation analysis enabled us to systematically study the interaction between callers and triage nurses by focusing on the various types of either/or-questions and what types of responses they yield [27,32]. Within our dataset of triage calls, we could collect 250 either/or-questions among 68 callers with chest discomfort (see Fig. 1 and Table 1). The frequency and distribution of the different formats within our dataset are displayed in Table 1.

Previously, we have shown what kind of response two-choice format questions, multiple-choice format questions and tag-questions elicit in triage conversations and when they are utilised effectively [33]. In this study, we focus on multiple-choice either/or-questions and the responses they elicit in phase three and five

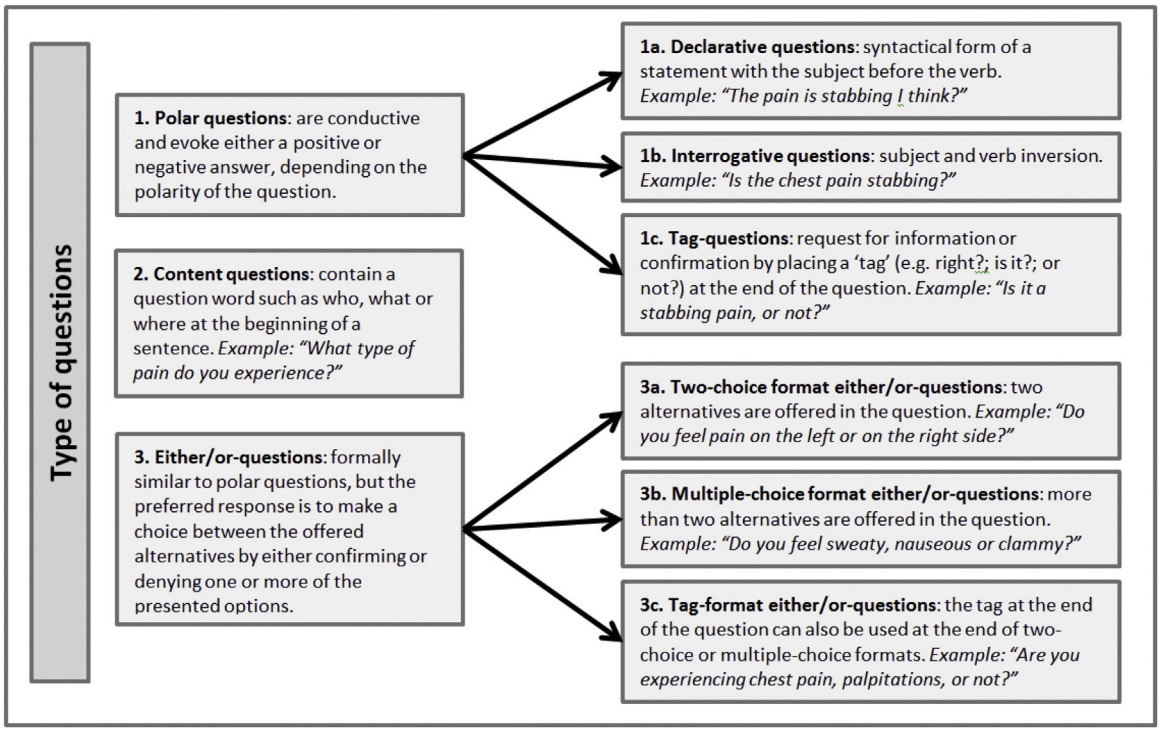

Fig. 2. Type of questions in Dutch and corresponding examples [20–25].

Table 1
Distribution of either/or-questions per phase of OHS-PC telephone triage conversations among 68 callers with chest discomfort (See also Fig. 1).

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Unclear	Total
Two-choice format	0	2	29	4	119	5	1	160
Multiple-choice format	0	0	15	0	47	1	0	63
Tag-questions[a]	0	0	4	3	18	2	0	27

[a] Tag questions are always a two-choice format or a multiple-choice format but are listed as a separate category because of the explicit use of a tag.

because of their high importance in the urgency allocation process, and because the frequent use of either/or-questions in these phases (see Table 1).

3. Results

The multiple-choice format of either/or-questions in our data and the hesitation markers in the responses show the callers' difficulties in responding to this type of questions. Our analysis showed that such difficulties mainly arise when a) questions are poorly designed; or b) when callers' complaints are ambiguously presented (i.e. callers are looking for words to describe the sensations experienced). These two categories will be further illustrated below.

3.1. Poorly designed multiple-choice either/or-questions

Callers often responded to questions with hesitation markers such as "eh", "ehm", pauses or restarts. Sometimes, the triage nurse had to repeat (part of) the question, in the absence of a clear response to all the options within the question. These hesitant responses led us to further investigate the (problematic) questions that preceded these responses. The data shows that problematic questions occured when response options have an unclear relation to each other. The use of the conjunction 'or' provides alternative response options. These options can exclude each other, i.e.: "on the left or on the right?" or they can offer options that fall within the same category, i.e.: "Is the pain stinging or pressing?" [34]. Sometimes, the offered values have an unclear relationship or they do not exclude each other risking interactional difficulties. Examples of problematic question designs are displayed in Table 2.

Not all problematic questions could be found by looking at problematic responses. In Table 3 we see a relatively straightforward response given by the caller in line 8. Here, the caller provides a confirmation ("yeah") and chooses one of the options provided by the question in lines 4–7: "it just stays the same all the time".

Taking a closer look at the question, the presented options (lines 4–7) concern breathing, movement and the course of the pain.

Table 2
Examples of poorly designed multiple-choice either/or-questions.

CC014	T:	*() And uh/ Because you've had these /t/ symptoms for three whole weeks? Really every < day>? Or uh is it fa[ding] too: or not?*
CC018	T:	*Hmhm. And do you also feel ↓sweaty or ↓clammy or do you feel a pain anywhere else?*
CC019	T:	*O↑kay and are you eh really aware of your heartbeat or are you saying well I ↑really do have this pressing PAIN on my chest or (.) I am brea:thless e:hm (.) What's the ↓most im↓portant mis↓ter (.)?*

Table 3
Transcript of CC041.

1	C:	Het is een pijn dat ik nog wel kan ver↓dragen. *It's a pain I can still tol↓erate.*
2	T:	↑Ja wat voor cijfer is dat? *↑Yes what number is it?*
3	C:	Hm: 4 of ↑5. *Hm: 4 or ↑5.*
4	T: →	Ok: En: e/ehm hoe is het > verder met die pijn<? Zit ie vast aan *Okay: And: u/uhm what > about this pain<? Is it connected to*
5		de < ademhaling > of als u een bepaalde < bewe:gingen maakt > of *your < breathing > or when you make a certain < move:ment > or*
6		als u wat gaat do:en is hij dan ↑erger of blijft ie ↑al die *when you're ab:out to do something does it get ↑worse or stay*
7		↓tijd hetzelfde? *the same ↑all the ↓time?*
8	C:	↓Ja het blijft gewoon al die tijd het↓zelfde (0.3) *↓Yeah it just stays the ↓same all the time (0.3)*
9	T:	Eh/ gebruikt u nog andere medicijnen? *Uh/ do you use any other medication?*

Table 4
Transcript of CC017.

1	T:	En u voelt zich niet ↓lekker *And you're not feeling ↓well*
2	C:	↓Nee al e:h ja al een paar dagen ↓niet gewoon echt pijn ↓echt *↓No not u:h yeah for a couple of days ↓just not real pain ↓really*
3	T: →	↓Ok. Maar het straalt ↑niet uit naar uw < arm > of uw < ka:ken> *↓Okay. But ↑doesn't it spread down your < arm > or to your < ja:w>*
4		of rug? *or back?*
5	C:	E:h ik/ ik/ ik/ ik/ ik weet het ↓echt niet. Ik weet het ↓echt niet. *U:h I/ I/ I/ I/ I ↓really don't know. I ↓really don't know.*
6		[Maar ik/] *[But I/]*
7	T: →	[Maar u kan zeggen of uw daar ook < pijn > heeft aan uw <↑arm > of uw *[But can you say if you have < pain > in your <↑arm > or your*
8		<↑kaak > of/ Of u daar ↑pijn heeft? <↑jaw > or/ Whether you have ↑pain there?*
9	C:	Dat heb ik niet in de ↓gaten eerlijk gezegd. *I'm not ↓aware of it honestly.*
10	T:	En u bent daar bij misselijk bij? Bent u ook aan het zweten? *And do you feel nauseous with it? Does it make you sweat too?*
11	C:	Ja ik voel mij gewoon niet/ Nee niet zweterig maar ik voel mij *Yeah I just don't feel/ No not sweaty but I just don't feel*
12		gewoon niet lekker. Ja. *well. Yeah.*

These options are presented as multiple-choice alternatives using 'or' to mark the various options. However, the relationship between these three options is imprecise and unclear. The options do not fall within the same category, nor do they exclude each other. In fact, the options cover three separate topics. The first two topics (respiration and movement) are polar (interrogative) questions (meaning that a yes or no response would be relevant) and the third option (course of pain) is a two-choice either/or-question "when you're about to do something does it get worse or stay the same?". Yet, these three topics and question formats are combined into one multiple-choice either/or-question with three options. Following the principle of interactional contiguity [35], the caller only responds to the last part of the question by choosing one of the two options. Whether the pain is connected to the respiration or movement is not mentioned and cannot be excluded with certainty. This example shows that by combining options with different content and/or combining different questions formats to form a multiple-choice either/or-question, the triage nurse risks missing out on important information. These poorly designed questions not only cost extra (unnecessary) time to respond to, but also possibly hinder safe triage.

3.2. Ambiguous presentation of complaints

In the dataset, some multiple-choice either/or-questions frequently lead to wordy and ambiguously formulated responses. On closer inspection, these types of ambiguous responses often concern complaints that are difficult to put into words by the caller. In these cases, either/or-questions did not help in eliciting a concrete response (see Table 4) [6].

During the call, the patient indicated that he was not feeling well with an unpleasant sensation on the his "left side", and he is afraid that it is related to his heart. After the caller was registered in the triage system, the triage nurse returns to the complaint of "not feeling well". If we analyse the interaction line-by-line, the either/or-question in lines 3–4 receives multiple hesitations, restarts and an ambiguous response. The phase of collecting additional medical information (phase five, Fig. 1) is opened in line 1 with "And you're not feeling well". By using this negatively formulated declarative, the triage nurse gives the caller little space to formulate his problem. Although the negative formulation is confirmed by the turn-initial "No" (line 2), the caller also briefly adds the elapsed period of time, a technique often used when problems are difficult to put in words [6], and follows up with an extreme case formulation: "real pain" with an additional "really". This extreme case formulation legitimates his complaints about the suffering endured [36]. By doing so, the caller stresses the severity of the problem and underlines that these sensations are more severe than "not feeling well" – as proposed by the triage nurse. Conveying that symptoms are worthy of a doctor's time and attention, is a phenomenon called *doctorability*, referring to patients' orientation towards legitimizing their request for the doctor's help [37,38]. Previous literature on doctorability described practices that patients use in contexts where justification of medical help seemed to be at stake. One of these is making 'troubles resistant' claims, e.g. about the length of time a patient waited before seeking medical help [37], which is also been done by the caller in line 2. This legitimization of the caller's problem is not responded to by the triage nurse with an acknowledgment, but rather with a transition in topic. By using "Okay. But . . . " (line 3) – a discourse marker followed by a contrastive discourse marker – the triage nurse indicates that she hasn't received the information she was looking for [39]. This then explains the concrete, declarative multiple-choice question in lines 3–4 giving three options concerning the location of radiating pain. However, the negative formulation within the question ("doesn't it . . . ") expects a negative response ("no, it doesn't"), making the caller's problem less doctorable. It is therefore not surprising that the caller's response (lines 5–6), shows multiple hesitation markers and restarts followed by a non-preferred response – rather than confirming that his problem is indeed not doctorable, the caller responds with "I really don't know". The triage nurse does not accept this 'unknowing' response (line 7) by using the contrastive discourse marker "but" and repeating the question in lines 7–8. Again, the caller is unable to respond to the question. This time, the triage nurse starts a new sequence with "and" offering two new topics (line 10), presumably in order to fill out the NTS. While confirming that he is not sweaty – and therefore making his own problem less doctorable, the caller still emphasizes that he doesn't feel well, a repetition of what the triage nurse stated in line 1.

This excerpt shows that the triage nurse has to interactionally work hard to find out what the caller is suffering from while the caller is continuously presenting his problem as doctorable. Offering all the options to the caller doesn't provide the triage nurse with the information she is looking for and costs valuable time. The caller's responses include hesitation markers, re-starts,

Table 5
Transcript of CC013.

1	T:	Ok. Even kijken hoe ik u kan helpen hoor. Vertel nog eens, *Okay. Let's see how I can help you, aye? Tell me again,*
2		sinds wanneer heeft u nou dat akelige gevoel op de borst? *when did you begin having that unpleasant feeling in your chest?*
3	C:	Ja nou goed. Ik eh/ Waar het voor mijn gevoel enigszins mee begonnen is, *Yeah, okay, I eh/ I think it started a bit*
4		is ik had ziekteverschijnselen. Beetje spierpijn in de *when I began getting symptoms. A bit of a muscle pain in the*
5		nek zeg maar. *neck, so to speak.*
(Time past: 01:42 min. Conversation about the course of the symptoms and use of medication.)		
5	C:	Nee het is/ het is ook geen echte ↓pijn. Ja het lijk wel of nu of *No it's/ it's not proper ↓pain either. Yeah it's like now and*
6		ik af en toe een scheutje voel zeg ↓maar. Maar dan vraag ik me af *then I feel a bit of a dash you ↓know. But then I wonder*
7		of dat in mn hoofd [((is die] dat *if it's all in my head [((is it]*
8	T:	[ja] *[yes]*
9	C:	zegt)) ((lacht)) of mijn lichaam zeg ↓maar *saying that?)) ((laughs)) or in my body you ↓know*
10	T: →	Ja maar/ en ((ik)) ben niet benauwd zeg je. Geen benauwd ge↓voel. *Yeah but/ you say ((I)) I'm not short of breath. No short↓iness of*
11		Je gaat op de fiets naar je ↓werk. Ik STEL even gewoon wat/ *breath? You ride your bike to your ↓work. I'm just ASKING a few/*
12		wat eh eh vra:↓gen IS er ergens ANDers < PIJN:> beHA:lve *few uh uh ques:↓tions IS there < PAIN:> somewhere ELse beSI:des*
13		dat > beklemmende gevoel op de borst<? [Bijvoorbeeld] *that > oppressive feeling in the chest<? [For example]*
14	C:	[Ja ()] *[Yes ()]*
15	T:	in de < bu:ik > of de < be:nen>, <linkera:rm > of de < ka:ken>? *in your < tum:my > or your < le:gs>, <left a:rm > or < ja:w>?*
16	C:	Ja. Ja. Nou goed eh/ ↓Linkerarm inderdaad daar eh ga je ook meteen *Yeah. Yeah. All right uh/ ↓left arm indeed uh you'd feel that*
17		aan voelen. Daar heb ik niet het idee dat ik daar iets [echt voel]. *right away. I don't think I [really feel] something there.*
18	T:	[Nee.] *[No.]*
19		Nee. *No.*
20	C:	Behalve dat ik er altijd op loop te drukken aan die linkerkant *Except I'm always feeling a tightness on my left side,*
21		de laatste dagen, dus dat gevoel af en toe. Het lijkt dat boven in *these past few days, that feeling, now and then. It feels like a*
22		boven in mijn rug een klein steekje zeg maar. *little stabbing at the top of my back so to speak.*
24	T:	Dus in de rug wel pijn? Boven in de rug? *So there's pain in your back? The upper back?*
25	C:	Ja. Ja het lijkt een beetje dat () dat daar soms een beetje/ ook een *Yes. Yes it seems like a bit () in there sometimes a bit/ of an*
26		naar gevoel. Soms een klein prikje, maar ook niet heel *unpleasant feeling too. Sometimes it stabs a bit, but it's not that*
27		heftig zeg maar. *intense you know.*
28	T:	Nee niet heftig. Maar het gaat mij om als iemand zegt ik heb *No not intense. But as far as I'm concerned, if someone says I feel*
29		een beklemmend gevoel op de borst dan wil ik gewoon een ja of een *feel painful pressure on my chest then I just want a yes or a*
30		nee bij, heeft u nog ergens anders pijn en waar dan? *no, do you have pain anywhere else and if so where?*
31	C:	Ok ok. Eh/ Ja. In de rug. (.) soms. *Okay okay. Uh/ Yes. In my back. (.) sometimes*
32	T:	In de rug. Dan vink ik dat aan. *In the back. Then I'll tick that.*
33	C:	Ja. *Okay.*

unknowing responses and repetitions, while the nurse continues to offer concrete symptom options in order to fill out the NTS.

In Table 5 the caller has an "unpleasant feeling" on his chest and has difficulties describing his complaints. First, the triage nurse checks the caller's safety (phase three, Fig. 1) and registers the caller in the triage system (phase four, Fig. 1). Then the triage nurse comes back to the opening question in line 1. The caller struggles to describe the unfamiliar sensations as "a bit of a dash" (line 6), "a little stabbing" (lines 21–22), "unpleasant feeling" (lines 26) and "it stabs a bit" (line 26) and mentions that he has difficulties in determining whether these symptoms are actual symptoms that he is experiencing (lines 6–7 and 9).

The triage nurse uses contrastive discourse markers showing that she is looking for other information: "Yeah but/ you say" (line 10), "But as far as I'm concerned," (line 28) showing that she hasn't got the information she needs and is still looking for a concrete response to be able to proceed to the next mandatory question within the NTS. That the triage nurse needs an unambiguous response in order to be able to fill out the NTS is even more evident from the utterance: "I just want a yes or a no" (lines 29–30). By creating this polarity there is no space given for narratives and ambiguously formulated complaints, like an "unpleasant feeling" or "it stabs a bit".

Remarkable is that the caller's response in line 31 ends with a minimal pause and an adverb of frequency "sometimes", downgrading the preferred unambiguous response "Yes. In my back" [40]. This also shows that the interactionally preferred option 'yes' doesn't cover the symptoms experienced. The confirmation of the triage nurse "I'll tick that" without repeating "sometimes" also implies that there is no attention given to the nuance that the word "sometimes" provides. "I'll tick that" shows that the triage nurse needs to tick one of the NTS boxes to be able to proceed. This displays the friction that occurs during the translation from conversational interaction to the NTS system.

4. Discussion and conclusion

4.1. Discussion

In triage conversations the institutional goal is to determine an adequate urgency in order to provide efficient and safe care. To support the triage nurses to reach this goal, the NTS was introduced in the Netherlands in 2011. The NTS displays key diagnostic topics in options (i.e. sweating, nausea, vomiting) to determine an urgency level. Subsequently, triage nurses formulate these options in either/or-questions ("And do you also feel ↓sweaty or ↓clammy or do you feel a pain anywhere else?"). Multiple-choice either/or-questions compel the caller to choose between options, while one option would lead to a higher urgency than the other. Subsequently, the triage nurses reduce callers' complaints into symptoms that can be documented in the NTS.

Triage nurses should be more attentive to the interactional implications of either/or-questions and further pursue patients who have difficulty verbalizing complaints through adequate question. The overriding interactional concern is how to focus the communication between triage nurse and caller on reaching the most appropriate urgency allocation, supported but not determined by a decision support system such as the NTS. Our conversation analysis reveals a deficiency of awareness among healthcare professionals of the influence of social technological aspects of the use of a decision support system [41,42]. The way that the NTS displays key diagnostic topics provokes using either/or-questions, which can lead to communicational pitfalls.

4.2. Conclusion

During telephone triage, the Netherlands Triage Standard decision support tool influences the interaction between triage nurses and callers as it displays key diagnostic options, encouraging the triage nurse to use multiple-choice either/or-questions to

check these options. Interactional difficulties mainly arise when questions are poorly designed by the triage nurse, or when the caller's complaints are ambiguously presented reflecting patient's difficulties to verbalize them. The implications are twofold: more awareness among triage nurses is needed on ineffective consequences that multiple-choice either/or-questions evoke in the interaction, which can be done by training. Also, improvement should be sought in changing the NTS display of diagnostic options.

4.3. Practice implications

Often improvements of triage are sought in the diagnostic information within the decision support tool, giving subordinate importance to the component of interaction between caller and triage nurse. Our data give rise to opportunities for improvement different than the diagnostic information itself. The practice implications are twofold. Firstly, the design of the NTS can be optimised to reduce the risk of communicational pitfalls and the triage nurses should be helped to be more resilient to these pitfalls.

We recommend further ethnomethodological research, comparable to a previous study on computer-aided dispatch [43], to establish how this optimisation can be reached. This could be done by carrying out field observations and by combining audio and video recordings of telephone triage conversations by triage nurses who use the NTS. In that way, one can analyse how computer triage tools utilised by triage nurses are embodied in the interaction and specifically in the use of either/or-questions. Secondly, awareness of the influence of the NTS on using multiple-choice either/or-questions in triage conversations should be raised among triage nurses. Our conversation analysis has led to two recommendations for daily practice:

1) Poorly designed multiple-choice either/or-questions can be avoided by utilizing questions with less options; the shorter the question the less chance of creating ambiguous questions leading to incomplete or unclear responses and missing out on important information. Also, the offered values in multiple-choice either/or-questions should be unambiguous and have a clear relationship to each other.
2) Regarding the phenomenon of using either/or-questions in case a caller has difficulties describing complaints (i.e. ambiguous presentation of complaints), we recommend making the presentation of complaints more specific through first asking content questions, and then either/or-questions, which demands a different design of the NTS. By giving more interactional space, the caller will be invited to clarify the symptoms experienced [8]. Critics might say that such invitations will incite winding narratives, however, we suggest that even in emergency conversations the advantages of narratives shouldn't be mistaken, as they permit the caller to give their own account of illness [6].

We argue that a better balance is needed between leaving space for narratives and asking either/or-questions in order to funnel complaints and to have an efficient and safe telephone triage conversation. To evoke a brief problem presentation, the triage nurse can take away callers' doubts of legitimacy by recognizing the need of the phone call. This is in line with previous literature describing doctorability and its effect of doctorability inviting physicians to offer reassurance as to the legitimacy of seeking for medical help [37]. A simple "good thing you called" during the problem presentation might reduce the chance that callers will make their problem doctorable in extended narrative styles which is suboptimal for adequate allocation of urgency and corresponding medical care. Because of the emergency context in which the calls take place, it is crucial that the triage happens fast in order to limit the delay of treatment, which is especially important for people calling with symptoms suggestive of acute coronary syndrome [16].

In order to raise awareness what either/or-questions questions do in interaction among triage nurses, and to apply the two recommendations above, it is advised to offer trainings based on research with real recordings, for example using the Conversation Analytic Role-play Method (CARM) [44,45]. By using real-life recordings, awareness can be created what questions really do as there is more to a question than meets the eye.

Funding

This work was supported by the department of general practice of the University Medical Center Utrecht, Associate Professorship-promotion grant of D.L. Zwart, MD, PhD, the foundation 'Netherlands Triage Standard' and the foundation 'Stoffels-Hornstra'. The views expressed are those of the authors and not necessarily those of the foundations. The funding foundations had no role in study design, data collection and analysis, preparation of the article, or decision to publish.

Informed consent statement

I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

Ethics approval

The Medical Ethics Review Committee, Utrecht, the Netherlands.

CRediT authorship contribution statement

Daphne C. Erkelens: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Project administration. **Tessa C. van Charldorp:** Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Supervision. **Vera V. Vinck:** Methodology, Formal analysis, Investigation, Writing - original draft. **Loes T. Wouters:** Writing - review & editing. **Roger A. Damoiseaux:** Writing - review & editing. **Frans H. Rutten:** Writing - review & editing, Funding acquisition. **Dorien L. Zwart:** Conceptualization, Formal analysis, Writing - review & editing, Funding acquisition. **Esther de Groot:** Conceptualization, Methodology, Investigation, Writing - original draft, Supervision.

Declaration of Competing Interest

The authors have no conflict of interest to declare.

Acknowledgements

We would like to thank the out-of-hours primary care foundation 'Primair Huisartsenposten' in Utrecht and linguistic student Celine van Laer for their participation.

Appendix A. Transcription conventions

The symbols listed below are based on Jefferson's glossary of transcript symbols, which are routinely used in conversation analytic research [31].

Symbol	Definition

(*Continued*)

Symbol	Definition
?	Strong rising phrase intonation
()	Inaudible speech
(guess)	Unclear speech, guess by researcher
((laughs))	Verbal description of (non-verbal) actions
/	Indicates a repair or a cut-off
(.)	Pause or silence less than 0.2 s
(1.0)	Pause or silence of one second
>word<	Faster than surrounding speech
<word>	Slower than surrounding speech
CAPITALS	Louder than surrounding speech
°word°	Softer than surrounding speech
:	Lengthening of the preceding speech
↑	Marked rising shift in syllable intonation
↓	Marked falling shift in syllable intonation

Appendix B. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.pec.2020.07.011.

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