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Displaying concerns within telephone triage conversations of callers with chest discomfort in out-of-hours primary care: A conversation analytic study

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ABSTRACT

Objectives: In primary care out of hours service (OHS-PC), triage nurses ask questions to assign urgency level for medical assessment. A semi-automatic decision tool (the Netherlands Triage Standard, NTS) facilitates triage nurses with key questions, but does not leave much room for paying attention to callers' concerns. We wanted to understand how callers with chest pain formulate their concerns and are helped further during telephone triage.
Methods: We conducted a conversation analytic study of 68 triage calls from callers with chest discomfort who contacted OHS-PC of which we selected 35 transcripts in which concerns were raised. We analyzed expressions of concerns and the corresponding triage nurse response.
Results: Due to the task-oriented nature of the NTS, callers' concerns were overlooked. For callers, however, discussing concerns was relevant, stressed by the finding that the majority of callers with chest discomfort expressed concerns.
Conclusions: Interactional difficulties in concern-related discussions arise**d** directly after expressed concerns if not handled adequately, or during the switch to the counseling phase.
Practice implications: When callers display concerns during telephone triage, we recommend triage nurses to explore them briefly and then return to the sequence of tasks described in the NTS-assisted triage process.

1. Introduction

During evenings, nights and weekend hours, people who need urgent general practitioner (GP) care may call the primary care out-of-hours service (OHS-PC). Triage nurses assign the urgency level based on caller's complaints and thereby the corresponding type of contact (direct ambulance, home visit, consultation or telephone advice) which is linked to a timeframe within which the patient needs to be seen by a medical professional [1]. Within a few minutes, triage nurses must balance safety and efficiency to select the most appropriate urgency, because that impacts the further care trajectory [2,3]. To support triage nurses in this task, the Netherlands Triage Standard (NTS) was implemented in 2011 in almost all OHS-PC centres in the Netherlands [4,5].

The NTS is a hierarchically ordered semi-automatic algorithm with around five key questions for 56 'entrance complaints', including chest discomfort. Depending on the answers of the caller, the NTS automatically generates an urgency level which is linked to an associated response time or whether a telephone advice is sufficient [4]. In this latter situation, the triage conversation switches after the completion of the triage to a telephone counselling conversation.

When triage nurses follow a decision support system, such as the NTS, triage conversations are task-oriented and have a consistent conversational format [6,7]. Although triage nurses may ask additional questions, they rarely deviate from the questions suggested by the NTS [8]. **Triage nurses remain focused on the task of securing the information needed to direct help and respond focused on matching the caller to the task at hand** [6]**.** As a result, topics not included in the NTS, such as caller's expectations, are rarely discussed during triage conversations [9]. **So, triage nurses structure the consultation by using a strict form of agenda setting** [10–13]**.**

Interactional problems, **such as such as deviating from the question-answer structure common in triage calls** may easily occur

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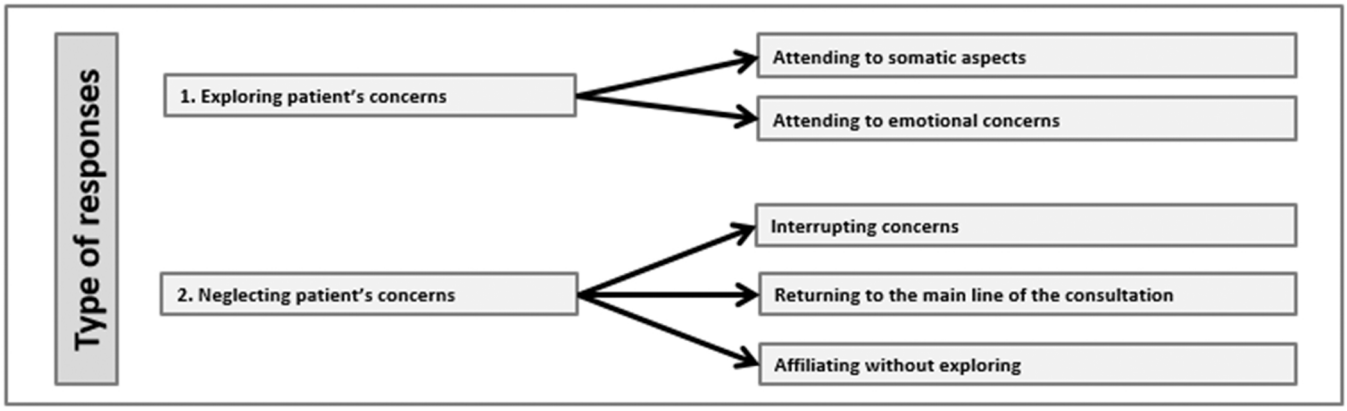

Fig. 1. Type of responses to expressions of concerns.

because both caller and triage nurse act from different institutional roles; as citizen caller and emergency call taker, respectively [6]. However, a concerted effort is needed to establish the goal of the telephone call and to avoid incongruent interactions which may arise when callers' and triage nurses' goals of the triage conversation are not aligned [14]. For triage nurses, the main goal of the triage conversation is to assign an urgency level. Callers, however, have their own goals, and one of these may be discussing their concerns. Importantly, callers are unaware of the hierarchically ordered NTS algorithm that triage nurses are required to follow. For both the triage nurse and the caller with chest discomfort, it is important to take the appropriate 'next steps' that are consistent with the triage nurse's urgency allocation and caller's concerns [15].

Additionally, the emotional involvement between a triage nurse and a caller may be different [16]. A triage call might be a matter of routine for the triage nurse but may be a major event for the caller, especially when they experience chest discomfort, likely being afraid of an acute coronary syndrome [17]. On the other hand, triage nurses may be emotionally involved as well, because triaging chest discomfort is stressful as they also may consider (cardiac) life-threatening disorders, and it is well-known that calamities at the OHS-PC most frequently missed are myocardial infarction and acute cardiac death [18,19]. These stressful conditions underlying such emergency calls may cause emotions or concerns of callers, which may negatively impact interactions**, possibly as a result of less optimal cognitive processing and attention** [20–22]. When callers verbalise emotions, they deviate from the interactional routine with the potential consequence that they miss the call taker's question [6]. At the same time, triage nurses often interrupt these callers trying to return to the NTS questions, thus risking missing callers' expressions of concerns. Callers who express emotions often have difficulty answering the triage nurse and may thus not provide the information that triage nurses require [23].

Previous studies also show that callers and triage nurses have different preferences when discussing concerns. Callers appreciate being given space to discuss their concerns and therewith prefer an exploring response from health care professionals [24]. Moreover, callers who are satisfied with the response to their concerns have better health outcomes and a better relationship with the healthcare professional [25]. However, discussing concerns may seem unnecessarily time-consuming for triage nurses and the context (urgent care setting and the decision support tool they work with) provokes asking direct questions, expecting short and to the point answers. This is generally considered as efficient and useful if there is a potential underlying life-threatening event [23].

We do not yet know how concerns are dealt with in triage interaction, nor do we know how triage nurses' response affects the efficiency and safety of triage conversations. Therefore, the purpose of this study is to better understand the interactional implications of discussing concerns during triage conversations between people who called the OHS-PC for chest discomfort and triage nurses who use the NTS tool.

2. Methods

This study is part of a larger research project on OHS-PC triage improvement [26,27]. Details about the study population and methodological approach were described in a previous study from our group [28].

We used conversation analysis to understand the interaction between callers and triage nurses when discussing concerns. Conversation analysis is a method in which social interaction is analyzed at a microscopic level using conversations that occurred naturally. The recordings are transcribed and analyzed retrospectively. Conversation analysis has been applied across all sorts of healthcare settings [29–31]. For an overview, see a state of the art overview by Barnes (2019) [32]. We used applied conversation analysis here to gain a better understanding of how social interaction works within triage care and to offer suggestions on how it can be improved. The emphasis here is on understanding language in this particularly organized setting, looking at what is the most fluid and successful way to communicate.

We used a selection of 68 triage conversations, of which we selected all transcripts (n = 35) in which concerns were discussed. Among these 68 patients, 40 were women (58.8%) and the mean age was 59.9 years (between 31 and 90 years). The outcome of 57 of these patients is known: 16 of them had an urgent outcome, of which acute coronary syndrome was the most common, and 41 of them had a non-urgent outcome. The average duration of the triage conversations was 7:02 min (range 1:28–12:48 min). We first used Jeffersonian conventions (see Appendix A) to visualize phonetic information and pacing for all selected Dutch-language transcripts [33]. After our analytical process, with a group of Dutch speaking researchers, we translated the fragments that we included in the manuscript into English. We have displayed both Dutch and English transcripts in our results section.

In order to select potential expressions of concerns, we needed to operationalize concerns. We were interested in concerns vocally expressed by the caller during the triage call, as triage nurses only have access to what the caller has said during the triage call and not any additional thoughts or feelings that are not expressed by the caller [23]. We therefore see concerns as an inner state *description* rather than an inner state [23]. This inner state description could be labeled as a mental state description, expressed by a first person singular and a mental verb or verbal expression, e.g. "I WAS KIND OF WORRIED" [34]. In doing so, we consider verbalized emotions, which is common in linguistics [23, 35–37].

These inner state descriptions can be divided into cues and concerns. Concerns are explicit expressions of worries by callers. Cues are more implicit and thus ambiguous [38]. Cues could be a sign of concerns by

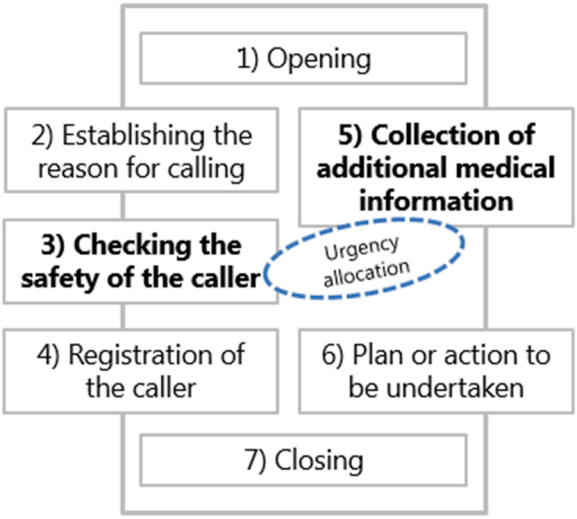

Fig. 2. Phases of telephone triage conversation at the out-of-hours service in primary care (OHS-PC).

Table 1
Frequency of concerns expressed during triage conversation among 68 callers with chest discomfort.

Times of expressed concerns	Number of triage conversations	Initiated by
0	33	
1	17	T: 2x, P: 9x. R: 6x
2	9	P-P: 7x, P-T: 2x
3	7	P-P-P: 3x, R-R-R: 1x, R-T-T: 1x, P-P-T: 1x, P-T-P: 1x
4	2	P-T-P-P: 1x, P-T-P-T: 1x

The third column shows the person who initiated the expression of concerns. Abbreviations are: P = patient, R = patient's representative (this could be, for example, a partner, a child or a parent of the caller), T = triage nurse. For example: P-P-T means that there are three expressions of concerns in which the first and second were initiated by the patient and the third by the triage nurse.

callers, such as sobbing or long hesitations, but a triage nurse must ask more questions to be sure [39,40]. We used both, cues *and* concerns, to select all potential expressions of concerns in our transcripts.

A previous study has categorized responses to concerns in triage conversations as exploring or neglecting the caller's concerns (see Fig. 1) [41]. When a triage nurse explores the caller's concerns, this can be done by attending to somatic aspects related to the concerns (e.g. ask for more information about the family history of coronary artery diseases or medical history of the caller him/herself) or to attend the emotional concerns itself. When a triage nurse neglects callers' concerns, this may be done by interrupting, returning or affiliating. We used this categorization as a starting point to determine the type of responses that triage nurses use.

The types of responses listed in this figure were identified by Arreskov et al [41]. *We constructed this figure based on the descriptions in their study.*

Table 3a
Transcript of CC037 in English.

T: WHAT ARE YOU ↑FEELING (.) tightness in your ↑chest?
P: A lot of tightness in my chest like a belt ((sniffs)) and and every time well I'm not quite sure below my chest you know
T: [↑Yes]
P: [So] like it's bruised all ↓over (.) and it just makes me think (()) and and my my belly is also ((so)) tender right now so I wonder well could I be could my stomach be a little is my stomach upset or something but there's this nagging pain (.) [((I mean))]
T: [But are you ↑nauseous?]
P: ↓Yes: that too ↓yes [I've had I've had (())/]
T: [Does the pain radiate to the ↑chest]/ But let me ask you a few ↓questions
P: Okay ((sniffs)) (1.5)
T: Does the pain radiate to somewhere ↑else?
P: Yes well to my to to my to my arm and to my leg
T: =Which ↑arm?
P: Left
T: (())/
P: And on the right I feel tingling too >YES I I I really feel like I'm thinking that something's very wrong now because this doesn't feel ↓right<
T: ↓No I'm just going to/ do you feel like you're going to ↑faint or are you then ↑other/ ↑sweaty uh ↑sweating a lot?
P: Yes ↑oh I find myself (()) breaking into such a sweat ((sniffs)) ((I mean)) that uh that I think think gee (())/
T: Are you familiar with ↑heart or uh ↑vascular diseases?

To understand when concerns are discussed during triage calls with the NTS, we used the phases defined by Erkelens et al. (see Fig. 2) [28].

The phases listed in this figure were identified during a previous study from our research group, based on the findings of this study combined with previous relevant literature [28].

3. Results

Our results begin with an overview of the frequency of concerns expressed in triage calls, and the phases in which this took place. This is followed by analyses of callers' expressions of concern and triage nurses' responses to concerns. Finally, we will discuss expressions of concerns that take place in a specific interactional environment, namely, when switching from a triage conversation to a telephone counseling conversation.

Triage nurses communicate with a task-driven approach during triage calls, asking the caller questions to complete the NTS. Following the 'question-answer turn-taking system', triage nurses ask questions automatically generated from the NTS to which a caller responds, followed by an answer or a new question from a triage nurse. We observed that the conversation is guided by the triage nurse assisted by the NTS and the callers' contribution to the conversation is limited to providing requested information. Questions about concerns are not included in the NTS, and might therefore be overlooked. For callers, however, discussing concerns is relevant, which our data also suggest by the large number of expressed concerns initiated by callers. Concerns are expressed one to four times per triage call (see Table 1). When concerns are brought up multiple times during a triage conversation, it is the same concern that returns, mostly because the caller comes back to them or, in a few cases because the triage nurse returns to the initially presented

Table 2
Distribution of initiating expressions of concerns by phase of OHS-PC telephone triage conversations among 68 callers with chest discomfort (see Fig. 2 for an explanation of the phases).

	Phase 2 – Establishing the reason for calling	Phase 3 – Checking the safety of the caller	Phase 5 – Collection of additional medical information	Phase 6 – Plan or action to be undertaken	**Total**
Patient	8	4	19	12	43
Triage nurse	0	0	4	7	11
Patient representative	3	1	1	5	10
Total	11	5	24	24	64

Table 3b
Transcript of CC037 in Dutch.

T: WAT HEEFT ↑U (.) druk op de ↑borst?
P: Druk op de borst helemaal een band ((snuift)) en en elke keer nou ik weet niet helemaal onder mijn borst weet je wel
T: [↑Ja]
P: [Zo] alsof het helemaal beurs ↓is (.) en het doet gewoon dat ik denk (()) en en ook mijn mijn buik doet ook ((zo)) op het ogenblik zeer dus ik denk nou ik zou wel aan mijn maag beetje mijn maag overstuur zijn of zo maar het blijft maar zeuren en (.) [((ik bedoel))]
T: [Maar bent u ↑misselijk?]
P: ↓Ja: ook dat ↓ja [ik heb al ik heb al (())/]
T: [Straalt die pijn op de ↑borst]/ Maar ik ga even wat vragen aan u ↓stellen
P: Ja ((snuift)) (1.5)
T: Straalt die pijn ook nog ergens naar toe ↑uit?
P: Ja nou naar mijn naar naar mijn naar mijn arm en naar mijn been
T: =Welke ↑arm?
P: Links
T: (())/
P: En rechts heb ik ook nog tintelingen >JA ik ik ik heb echt zo iets van dat ik denk dat er is gewoon nu echt iets aan de hand want dit klopt ↓niet<
T: ↓Nee ik ga even/ heeft u het gevoel van ↑flauwvallen of heeft u daar ↑anderen/ ↑zweterig eh erg ↑zweten?
P: Ja ↑oh ik heb wel (()) dat ik het zweet uitbreek ((snuift)) ((bedoel)) van eh dat ik denk denk nou (())/
T: Bent u bekend met ↑hart of eh ↑vaatziekten?

concern.

These concerns emerged in different phases of the triage conversations (see Table 2). All concerns discussed in phases 2 and 3 were initiated by the caller.

In phases 2,3 and 5, the callers' concerns were often added immediately after answering a question from the triage nurse. Table 3a and Table 3b shows a typical example of expression of concerns by the caller.

The excerpt starts with a question from the triage nurse in line 1 s after the conversation initiated in phase 1. The caller responds in lines 2–3 and seeks affirmation. The nurse provides this affirmation in line 4, encouraging the caller to elaborate. During elaboration in lines 5–7, the caller mentions her stomach as a possibly cause. Medical knowledge is the triage nurse's area of expertise, not that of the caller. This is illustrated by the number of hesitations, the use of the construction 'I think' and restarts by the caller. Furthermore, in line 7, the caller uses 'or something', denoting lack of sufficient knowledge about the topic and downgrading her own epistemic stance on this topic [42]. In line 8, the triage nurse returns to the NTS-directed line of questioning, asking for nausea. After confirmation, and before the caller can once again elaborate, the triage nurse interrupts the caller and asks for the next – NTS relevant – question in line 10. The triage nurse inserts a meta-comment to announce what she is doing: 'asking questions' and continues to do so in lines 12 and 14. After the caller's specification of her left arm, the caller self-initiates another elaboration. She starts this with 'and' in line 17. Whereas the pain extends to her left arm, her right arm also experiences tingling. Here we see that the caller first answers the NTS question put forward by the triage nurse and then provides additional information about her concerns. This caller speeds up the rate of speaking, possibly to ensure that she can fully express her concerns. We often see this adjustment in speaking rate when competing for turns in conversations [43]. We also see some hesitation, in the form of hesitation markers in this utterance because the caller repeats the word 'I' three times [44]. When a caller unexpectedly changes the subject, which is called an 'in-situ announcement', she begins to hesitate [45]. When expressing her concerns in line 18, the caller uses 'really' and 'very', intensifying discourse markers to accentuate that something is really the matter [46].

The response in line 19 is short. The triage nurse confirms that something is really off with a downward intonation 'no' and immediately – within the same breath – continues with explaining her next step 'I'm just going to', but restarts and immediately asks the next NTS-relevant question. The caller accepts the shift and answers the question in lines 21–22.

This type of expression of concern is quite typical in our data: the callers speeds up the rate of speech after answering a question and hesitates in this expression.

These typical expressions of concern invite different types of responses. We now turn to the responses in more detail. All of these responses have different interactional implications for the triage conversation. **We first describe the response in the specific transcript in detail, followed by a general conclusion at the end.**

Table 4a and Table 4b shows a type **1** response (returning to the main line of the consultation – see Fig. 1).

The caller expresses concerns in lines 2–7 by saying that he is concerned because he does not know what the cause of his complaints is. As in Table 3a and Table 3b, this is not the expertise of the caller, which is illustrated by hesitations and a restart. In line 8, the triage nurse responds with "yes" to this, followed by a short pause, which is immediately followed by the next NTS question, without further attention to the concerns expressed. As a result, the caller returns to these concerns later during the triage call, which almost always happens when this type of

Table 4a
Transcript of CC001 in English.

T: And what would you now like ↓us to do for you now? What do you yourself: wa[nt?]
P: [UH] I DON'T KNOW I WAS A LITTLE WORRIED SEE I ↓THOUGHT YOU JUST DON'T KNOW WHAT IT COULD ACTUALLY BE but I thought I'll just mention it and also um: about exercising ↓that I've been doing a lot of exercising lately ↓maybe the two things ↓could be related so that/so that a few things can be ruled out and ↓but uh: yeah it's scary u:h (.)
T: ↓Yes
P: <Something like ↓that>
T:↓Yes (.) and are you experiencing palpitations now ↑as well, or not?
P: No ↓no I'm ↓not

Table 4b
Transcript of CC001 in Dutch.

T: En wat wilt u nu dat ↓wij gaan doen nu voor u? Wat zou u zelf: will[en?]
P: [EH] IK WEET NIET IK WAS EEN BEETJE ONGERUST JA IK ↓DENK JE WEET NOOIT WAT HET KAN ZIJN EIGENLIJK maar ik denk ik zal even zeggen ook van ehm: met dat sporten zeg ↓maar dat ik best veel ben gaan sporten de laatste tijd ↓misschien dat het een met het ander te maken ↓kan hebben om toch/ toch wat dingetjes uit te sluiten zeg ↓maar eh: ja je schrikt er toch van e:h (.)
T: ↓Ja
P: <Van ↓zoiets>
T:↓Ja (.) en heeft u ook hartkloppingen nu ↑ook of dat niet?
P: Nee ↓nee dat ↓niet

Table 5a
Transcript of CC017 in English.

T: What seems to be the ↑problem? (.)
P: My side has been bothering me for uh three days now. <My u:h (.) left side.>
T: ↑Yes.
P: It's like it uh stings. Hurts a lot. And I'm scared that there's something wrong with my/ with my heart °or something°.
T: Because you have chest pain? Or uh? [(())] Exactly where do you feel it?
P: [(())] Just a little/ Just a little>a little< left of my chest ↓yes.

Table 5b
Transcript of CC017 in Dutch.

T: Wat is er aan de ↑hand? (.)
P: Ik heb nu eigenlijk al eh drie dagen last van mijn zijkant. <Van mijn e:h (.) linkerkant.>
T: ↑Ja.
P: Het is net eh alsof het prikt. Heel erg pijn. En ik ben bang dat er iets met mijn/ met mijn hart is °ofzo°.
T: Want u heeft op de borst pijn? Of eh? [(())] Ter hoogte waarvan zit het?
P: [(())] Net ietsjes/ Net ietsjes >ietsjes< linker van mijn borst ↓ja.

Table 6a
Transcript of CC009 in English.

T: °Just letting ((my/)) (.) my colleague know° <um> let's see took no ac:tion ((types)) <and> the reason that you are calling emergency now is what could this be ↑huh (.) that is [really] the ↓question
P: [↓Yes] well yes because I am actually kind of worried [↓but]
T: [Yes] ok but you didn't feel it last ↑week? >Because you're saying that you've had these symptoms for a week<
P: °Well yes uh then I was sort of thinking that it uh well yeah what was it° 5 times a day [but then] spread out over a whole half a day
T: [↑Uhuh]
T: ↑Uhuh
P: And uh this afternoon at around say <um> between 2 and 5 it happened a number of times (.)
T: ↑Uhuh
P: And then I thought ↑oh [that's more than usual]

Table 6b
Transcript of CC009 in Dutch.

T: °Even ((mijn/)) (.) mijn collega doorgeven° <ehm> even kijken zelf niets gedaa:n ((typt)) <en> de reden dat u nu de spoeddienst belt is wat kan dit zijn ↑he (.) dat is [eigenlijk] de ↓vraag
P: [↓Ja] nou ja omdat ik me toch wel een soort van zorgen maak [↓maar]
T: [Ja] ok maar afgelopen week had u dat ↑niet? >Omdat u zegt het is al een week deze klachten<
P: °Nou ja eh toen was het een soort van dat het eh nou ja wat zou het zijn° 5 keer per dag was [maar dan] verspreid over een heel dagdeel
T: [↑Hmhm]
T: ↑Hmhm
P: En eh vanmiddag was het zeg maar <ehm> tussen 2 en 5 dat het al een aantal keren steeds kwam (.)
T: ↑Hmhm
P: En dat ik dacht van ↑oh [het is meer dan normaal]

Table 7a
Transcript of CC037 in English.

T: >I UNDERSTAND that you're nervous that you/ we will cer:tainly take care of you but please let me ask you a few questions ↓first< (.) if you were to give the level of pain a score with 0 being no pain and 10 a lot of ↓pain or aren't you experiencing any ↑pain?
P: Well it feels awful it's just something something that makes me think something's wrong

Table 7b
Transcript of CC037 in Dutch.

T: >IK SNAP dat u zenuwachtig bent dat u/ we gaan ze:ker voor u zorg dragen maar als ik even een paar vragen mag ↓stellen< (.) als u de pijn een cijfer moet geven 0 is geen pijn 10 veel ↓pijn of zegt u ik heb geen ↑pijn?
P: Nou het is een rot gevoel het is gewoon iets iets wat ik denk van dat hoort niet

response is used by triage nurses.

Table 5a and Table 5b shows a type **2** response (exploring callers' concerns by attending to somatic aspects).

The caller expresses her concerns in line 4–5 by saying that she is afraid of heart problems. Although these symptoms concern her body, she presents them with a low epistemic stance, addressing a possible cause, 'something' with the heart is the problem, downplayed by 'or something'. The triage nurse responds by addressing the somatic aspects of these concerns by asking relevant questions for the urgency allocation related to the concerns about heart problems. There is some hesitation by the triage nurse as well when asking these questions. She asks three questions immediately following each other without awaiting the response of the caller, using 'eh' as hesitation marker. In this case, the caller responds, in lines 7–8, by answering the last question of the triage nurse in which hesitation is shown again illustrated by repetitions in this utterance. This response is seen in about 50% of these type 2 responses by triage nurses. In the other 50%, callers continue to talk about their concerns without answering the question of the triage nurse.

Table 6a and Table 6b shows a type **3** response (exploring callers' concerns by attending to emotional concerns).

The caller expresses her concerns in line 3 and the triage nurse responds in lines 6–7 (English) by paying attention to the emotional part to ask if these concerns are new to the patient and she increases speed when explaining the reason for this question. In lines 7–8, the caller lowers the voice and uses as lot of hesitation when answering this question and explains that the complaints currently occur more frequently, which concerned the caller. The caller continues this argumentation in the lines 11–12 and line 14. Thus, it appears that the caller continues to talk about the concerns and the reasons for them; a response we almost always observe when triage nurses use a type 3 response.

Table 7a and Table 7b shows a type of response that was not described previously (see Fig. 1) [41]. We call this a type **4** response: exploring callers' concerns and immediately returning to the main line of the consultation.

In lines 1–3, the triage nurse increases the speed and tells the caller more loudly that she has heard the patient's concerns by saying that she understands the caller. She combines this response with the immediate announcement that she has more questions, followed by a short pause and one of these questions. The patient responds by answering this question, without returning to the concerns later in this conversation. The caller's responses are always similar to the response shown in this example when triage nurses use a type 4 response.

In sum, in Fig. 1, we showed five possible ways to respond to concerns [41]. Three of these types of responses could be detected in our triage conversations:

1. Returning to the main line of the consultation: triage nurses do not respond to the expressed concerns, but continue with the next NTS question;
2. Exploring callers' concerns by attending to somatic aspects: when callers express concerns about specific diseases, triage nurses may respond by asking for more medical information related to that specific disease. For example, a question about heart diseases in the family when a caller expresses concerns about a myocardial infarction;
3. Exploring callers' concerns by attending to emotional concerns: triage nurses provide an empathetic response and elaborate on the concerns.

   In our data, however, we also see a combination of type 3 and type 1:
4. Exploring callers' concerns and immediately returning to the main line of the consultation: Triage nurses provide an empathetic response and build on the concerns, however, immediately followed by a further outline for the triage conversation.

Interestingly, we also discovered that the phase in which the concerns are shared, is highly relevant.

Concerns are often discussed in phase 6 and in this phase they can be initiated by both the caller as well as the triage nurses (see Table 2). If the symptoms are considered as non-urgent, the triage nurse gives self-management advices by phone, and thus switches from a triage to a counseling conversation. Sometimes, the triage nurse begins this counseling conversation with a summary of the caller's medical complaints, after which the triage nurse asks the caller what he or she needs.

The key question during this wrap-up counseling is: 'What matters to you?' and not: 'What is the matter?', which is asked in phase 2 (reason-for-calling) where medical symptoms that warrant urgency allocation are discussed [47]. We will further use the term 'matters-question' for this aspect. This is similar to what general practitioners do during GP consultations [48–50]. During this phase 6, triage nurses do explicitly ask if the callers' reason for calling was concerns (i.e.: "And the real reason for calling is actually (.) <what could this ↓be?> ° (That's) what's really worrying me ↓now"), while other triage nurses ask a more

Table 8a
Transcript of CC077 in English.

T: Um:: let's see and do you have any ↑other illnesses or ↑otherwise? (.)
P: ↓No(.)
T: Otherwise you're heal↓thy
P: ((No I'm)) ↓Yes:(.)
T: ↓Ok um (1.5) what would you yourself like us to ↓do for you? (.)
P: Well I don't know myself I just don't dare to ↑lie down (flat) in bed. I'm/ it happens ↓again every time
T: [↑Yes]
P: [I'm] a little scared about it uh (()) (I'm actually staying somewhere else for a while) (1.5) I'm not < ↓at home> and uh (2.0)
T: ↓Ok I'll just discuss this briefly with the uh family doctor here <just a sec'> I'll be right ↓back

Table 8b
Transcript of CC077 in Dutch.

T: Ehm:: even kijken en bent u ↑verder nog bekent met ziektes of ↑zo? (.)
P: ↓Nee(.)
T: Verder goed ge↓zond
P: ((Nee dat)) ↓Ja:(.)
T: ↓Ok ehm (1.5) wat zou u zelf graag willen dat we voor u ↓doen? (.)
P: Nou ik weet het zelf niet ik durf gewoon niet in bed (plat) te gaan ↑liggen. Ik ben/ het komt elke keer ↓terug
T: [↑Ja]
P: [Ik ben] er een beetje bang van eh (()) (ik zit eigenlijk een beetje op de vreemde) (1.5) ik ben niet < ↓thuis> en eh (2.0)
T: ↓Ok ik overleg het even met de eh huisarts hier <momentje> ik ben zo bij u ↓terug

open-ended 'matters-question' to which the caller may respond by expressing concerns (i.e.: "And your/ what exactly are you <asking> ↑us? U:h what is it you [<want?>]"). In Table 8a and Table 8b we see an example of concerns that arise when asking for the 'matters-question'.

The triage nurse has just finished phase 5 and asked her last question in line 1 and 3. When the caller responded negatively, which implies that she is actually quite healthy, the nurse continues with a downward intonation 'ok'. A short hesitation marker ('ehm') and a long pause (1.5 s) indicate that this is the end of the formal NTS guided triage questioning. A very last question then remains: 'What would you yourself like us to do for you?', redirecting the conversation to the caller's needs. This 'matters-question' opens up space for the caller to express her concerns, mainly related to fear of lying down (lines 6–7) and being afraid (lines 9–10). It is notable that in line 11 the triage nurse responds by noting that she will discuss with the supervising GP. Furthermore, the triage nurse overrules the NTS urgency to a higher urgency level and corresponding action. We see this more often in triage calls when the caller expresses concerns after the triage nurse asks the 'matters-question' while the formal urgency allocation has already been completed. The triage nurse has switched to a counseling conversation, but because of caller's concern, she implicitly returns to the triage conversation and adjusts the urgency level. In sum, concerns first raised in phase 6 may prompt a return to urgency allocation (phases 3 and 5) rather than remaining in phase 6.

4. Discussion and conclusion

4.1. Discussion

It is essential for triage nurses to recognize callers' concerns to adequately balancing safety and efficiency. This can be difficult because patients may use vague cues to express their concerns [38–40]. Our analysis showed some common aspects of expressed concerns that can be used as clues to recognize potentially expressed concerns: speeding up the rate of speech after answering a question to add expression of concerns and hesitation in expression due to an unexpected change of topic.

The most efficient response to concerns seems to be where the triage nurse first explores the caller's concerns and then returns to the main line of the consultation by outlining the next steps in the triage process. For the caller, this means getting confirmation that their concerns have been attended to by the triage nurse, but also some explanation of the next steps in the triage conversation to prevent patients from lingering on their concerns. This type of response was recommended as well by another study on emergency conversations [23]. In addition to this reason of efficiency, it is also important to handle concerns in this way to improve health outcomes because callers who are satisfied with the response to their concerns in general have better health outcomes [25].

Although this response to concerns is already described as effective in other types of studies, it is not yet used in most of the triage conversations analyzed [23]. This may be a result of the triage nurse's focus on handling the NTS questions to get the NTS to generate the urgency level. Indeed, in the meantime, they experience high time pressure, especially when the call falls within the domain of chest discomfort. They feel the urge to act as soon as possible.

Only 11% of triage nurses ask the 'matters-question' during a telephone consultation compared to 43% of GPs during regular care in the consultation room [51]. This makes sense because triage aims to distribute the available (emergency) GP care as efficiently as possible. However, when the triage conversation transitions to the counseling conversation, the triage becomes more patient centered. Asking the 'matters-question' (earlier) in the counseling conversation can help to consider the caller's perspective and it becomes easier to explain why an appointment is not necessary or to reassure.

Moreover, more shared decision-making at the beginning of the consultation can improve triage decision-making by improving the contact between triage nurse and patient and thereby facilitating the sharing of as much relevant information as possible [52,53]. This can be achieved by showing that the triage nurse has heard the concerns and then explaining that the triage phase will follow to allocate urgency.

Interactional difficulties may arise in phase 6, when asking the 'matters-question' when switching to a counseling consultation. As described above, a positive aspect of asking this 'matters-question', is that it allows space for the caller's concerns, which can help align the goals of triage nurses and callers to avoid interactional problems. On the other hand, we have seen that triage nurses sometimes overrule the NTS urgency to a higher urgency based on the caller's wishes or concerns rather than based on urgency reasons determined in the earlier phases. So, triage conversation and counseling conversation then intermingle instead of taking place one after the other. To avoid this intermingling, it may be helpful to let another healthcare professional (e.g. GP) do the switching to a counseling conversation and thereafter end the conversation. In this way the triage professionals can stick to their own roles and do not have to switch stances during a call, which can be confusing for both the healthcare provider and the caller. Otherwise, after switching to a counseling conversation, triage nurses should stick to their new task of healthcare provider, in which efficiency and caller-centeredness are important aspects, instead of returning to the task of triage nurses, in which efficiency and safety are important aspects. Hence, avoiding 'overtriage' by adjustment of the urgency level during the counseling conversation solely based on the caller's concerns instead of on medical urgency [16]. This is inefficient and can ultimately limit the availability of care for those who really need it.

4.2. Conclusion

This study provides new insights into the management of concerns during telephone triage of chest discomfort in OHS-PC. Interactional difficulties in concern-related discussions arise directly after expressed concerns if not handled adequately, or during the switch to the counseling phase. In the latter phase, it may result in upgrading the urgency.

Conversation analysis is very fitting method to analyze triage calls and answer as we had access to the authentic recordings of triage calls.

This allowed us to see how concerns were handled in situ. This means we were able to go beyond description of interaction, and actually demonstrate what participants achieve in interaction on a turn-by-turn basis [34]. One could argue that the lack of nonverbal communication is a disadvantage in call analysis, especially when expressing concerns. However, triage nurses and callers do not see each other either and therefore have no information about nonverbal communication during triage calls.

4.3. Practice implications

Of course, first and foremost, it is important that triage nurses make the right decision regarding urgency allocation (safety). For this, it is important that triage nurses get answers to the questions from the NTS in order to estimate the urgency properly. At the same time, it is important that the conversation goes smoothly and successfully in order to be able to determine the urgency in sometimes life-threatening situations as quickly as possible (efficiency). Because patients who call are often anxious, it is helpful for triage nurses to know how best to deal with expressed anxiety in order to make the rest of the conversation run as smoothly as possible and to be able to estimate urgency as quickly as possible.

We therefore recommend triage nurses to respond to concerns immediately by (i) exploring these, followed by (ii) explaining the caller the further trajectory of the triage conversation. Then, triage nurses clearly show that they have heard the concerns, and callers are informed about what the triage nurse expects during the following parts of the triage conversation. These responses on sequential level of interaction result in halting topic elaboration and shifting to problem-solving [54–58].

We also recommend triage nurses to ask for the 'matters-question' when switching from a triage conversation to a counseling conversation to align goals of callers and triage nurses. Knowledge of the answer to the 'matters-question' may help the triage nurse narrate the current plan in accordance with what is important to the patient.

Besides, further research is needed to examine whether displaying concerns by callers could possibly be relevant as a triage criterion. In Danish OHS-PC, triage nurses already ask callers to rate their level of concern [59]. A high self-reported level of concerns is associated with a higher likelihood of hospitalization within two days of the triage call. It is plausible that expressed concerns during triage conversations are associated with urgent outcomes. An urgent diagnosis, such as acute coronary syndrome may cause feelings of anxiety or an eerie feeling in patients [60]. Therefore, large-scale studies are needed to determine whether expressed concerns in the triage conversation are indeed associated with a more urgent diagnosis. It is probably useful to score these single identifying emotions as subjective units of distress rather than just the presence or absence of concerns [61]. Based on these findings, concerns could be given a more explicit role in triage conversations to make the right decision on urgency allocation.

Ethics approval

The Medical Ethics Review Committee Utrecht, the Netherlands, approved the study protocol. We conducted the study in compliance with applicable laws and regulations, including the World Health Organization's "Code of Conduct for Responsible Research," the EU GDPR (General Data Protection Regulation) and the "Medical Treatment Agreement Act" (WGBO). The data were kept confidential. Prior to the data session, the recordings were anonymized and all involved signed a confidentiality agreement.

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Table 9
The symbols listed below are based on Jefferson's glossary of transcript symbols, which are routinely used in conversation analytic research. [23].

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

CRediT authorship contribution statement

Michelle Spek: 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. **Roderick P. Venekamp**: Writing - Review & Editing. **Frans H. Rutten**: Writing - Review & Editing, Funding acquisition. **Dorien L. Zwart**: Conceptualization, Formal analysis, Review & Editing, Funding acquisition. **Esther de Groot**: Conceptualization, Methodology, Investigation, Writing - Original Draft, Supervision.

Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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Appendix A

See Table 9.

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