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The floor is yours – or mine?

Observational study on how and when consultants interrupt their patients' opening statements

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Abstract

Objective To analyse verbal interruptions by Dutch hospital consultants during the patient's opening statement in medical encounters.

Design Cross-sectional descriptive study.

Setting Isala, a general teaching hospital in Zwolle, the Netherlands.

Participants 94 consultations of 27 consultants, video recorded in 2018 and 2019.

Main outcome measures Physicians' verbal interruptions during patients' opening statements and time to first interruption.

Results Patients were interrupted a median of 9 times per minute during their opening statement, the median time to first interruption was 6.5 s. Most interruptions (67%) were backchannels (such as "hm hm" or "go on"), considered to be encouraging the patient to continue. In 52 consultations (55%), patients could not finish their opening statement due to a floor changing interruption by the consultant. The median time to such an interruption was 31.4 seconds, on average 20 seconds shorter than the time required to complete an opening statement (p=0.004). Female consultants used more backchannels (median 9, interquartile range [IQR] 5 to 12) than male consultants (median 7, IQR 2 to 11, p=0.028).

Conclusions Hospital-based consultants use various ways to interrupt patients during their opening statements. Most of these interruptions are encouraging backchannels. Still, consultants change the conversational floor in more than half of their patients during their opening statements after a median of 31 seconds.

Introduction

Despite increasing attention to patient-centred communication, patients still complain that doctors do not listen enough, insufficiently address their concerns, and interrupt them when they present their concerns or complaints[1,2]. A major cause for these shortcomings could lie in the time pressure consultants perceive[3], and subsequent strategies they have developed to cope with this, for example, controlling the length of the consultation by interrupting patients[4]. By limiting patients in the time and space given to discuss their complaints, consultants risk missing out on crucial information. Research has shown that patients commonly have multiple complaints to discuss[5,6], and that, when interrupted, they take on a more passive role[7], potentially causing important information to remain unmentioned. In addition, interruptions may lead to 'doorknob complaints' being presented towards the end of the consultation[5,8,9]. Although intended to reduce the time spent in consultation, interruptions may therefore have the opposite effect.

The opening of the consultation lays the foundation of a trusting patient-physician relationship, which can contribute to improving patients' health[10–12]. The opening statement is commonly the only time in the consultation when patients are given the 'floor'[13]. Patients appreciate being given the opportunity to explain their complaints in their own words[13]. Interrupting the patient's opening statement can harm the process of building this relationship of mutual trust[14,15], limit the already asymmetric position of the patient in the consultation[16–18], and may come across as rejection to patients who already indicate that fear of rejection is a reason for them not to share everything they would like to[19].

Research, mostly in the general practice setting, has shown that physicians interrupt their patients' opening statements in 70% of consultations and very early into the consultation, on average after 12 seconds[8,20–24]. Little is known on interruptions in consultations by hospital-based consultants, who constitute the majority of physicians. In addition, most interruption studies have been performed more than 10 years ago. In view of the increased attention to patient-centred communication in medical curricula and the lay press, the available literature may therefore not represent current medical practice regarding interruption of patients during their opening statement. Finally, the currently available literature on interruptions in medical consultations does not distinguish between different types of interruptions, which may be relevant because recent studies have shown that not all interruptions have a negative effect[25–27], and that some interruptions may also have supportive[28] and affirming[29] functions in the consultation.

This study analysed hospital consultants' verbal interruption behaviour during medical consultations with patients, considering various forms of interruptions and their effects on the doctor-patient consultation.

Methods

We analysed a sample of consultations from an existing repository of 781 video-recorded consultations, recorded between November 2018 and April 2019, with 41 consultants at Isala Hospital, Zwolle, The Netherlands, an 1100-bed general teaching hospital serving a mixed urban-rural population of approximately 600 000 people[29].

Consultations in which new patients (or caregiver with children aged 12 years or younger) were given the opportunity to discuss their opening statement were included. Consultations with a significant language barrier were excluded. Gender and age of included patients and consultants were collected.

Every utterance of the consulting physician during the patient's opening statement was considered an interruption. The opening statement was defined as the time during which the patient discussed his or her reason for coming, starting with the patient's first words on this subject, ending when the consultant received or took the floor. An opening statement was considered completed when (a) the patient communicated its completion (e.g., "*that's it*" or "*that's why I've come here*"), (b) responded positively to the consultant's closing question (e.g., patient: "*I guess I wanted to know whether it could be treated*.", consultant: "*That seems like a reasonable question, right?*", patient**:** "*Yes, I think so too.*") or (c) when the consultant took over the floor (e.g., patient: "*And that was only the beginning, because...*", consultant: "*Have you been experiencing palpitations?*").

We distinguished interruptions by which the consultant took the floor from the patient (floor changing interruptions) from interruptions in which the floor remained with the patient (opening statement interruptions). Opening statement interruptions were classified as 'backchannels' (utterances such as *"hm-hm"*, *"yes"* or *"go on"*, which most communication researchers consider to be non-intrusive encouragements for the patient to continue their opening statement[30]) and non-backchannels (for example, utterances prompting a change of subject, a correction, a clarification, or a reflection on patients' accounts of their symptoms, see figure 1).

The time to interruption was measured as the time between the start of the opening statement and the first interruption of that type.

Statistical analyses were performed using non-parametric methods, due to non-normally distributed continuous variables, in SPSS Statistics 27. Based on previous studies assessing how often patients can complete their opening statement without interruptions,[9, 21-24] aiming for a power of 0.8 (with an alpha set at 0.05), we calculated the required number of consultations at 66 using a binomial test. To allow for consultations to be excluded for technical failures or practical reasons (e.g., extensive small talk or intrusions at the beginning of a consultation, disturbing the presentation of an opening statement), we aimed to include at least 90 consultations, which we randomly selected from the consultations which met our inclusion and exclusion criteria listed above.

Patient and public involvement

Patients and public were not involved in the design and conduct of the study.

Results

Demographics

Most of the 781 consultations in the repository were follow-up consultations of patients with a chronic disease. There were 212 consultations with a new patient, 122 of which met the inclusion and exclusion criteria. A total of 94 consultations by 27 consultants (maximum 4 per consultant) from 15 disciplines were randomly selected for analysis from these 122. Patients' ages ranged from 0 to 88 (median 41 years); 54% were women. Consultants' ages ranged from 36 to 63 years (median 47 years); 34 were women (36%).

Interrater agreement

The first ten consultations were analysed by two investigators, who independently classified interruptions as outlined in figure 1. The kappa coefficient for agreement on floor change occurrence was 0.51, and on subtyping into backchannels and non-backchannels 0.73, indicating moderate and good agreement, respectively[31].

Interruptions

Overall, 840 interruptions were recorded, 788 of which were opening statement interruptions, a median of 7 per consultation (range 0-40), or 9 per minute (range 0-43). In only one consultation, the consultant made no interruptions during the patient's opening statement, which the patient completed after 9.8 seconds.

The non-floor changing opening statement interruptions were classified into 5 subtypes (table 1). Most interruptions were backchannels, with a median of 5 per consultation (range 0-29), or 8 per minute (range 0-35). Backchannel interruptions occurred in 89 consultations (95%).

Table 1. Frequencies and percentages of the types of interruptions.

	N	%	Time to interruption/completion		Type of content		
			Median (seconds)	Range (seconds)	Name	N	%
Opening statement backchannels	591	70.4%	6.5	0 – 83.9	-	-	-
Opening statement non-backchannels	197	23.5%	18.5	0 – 86.5	Change of subject	7	3.6%
					Correcting/supplementing	47	23.9%
					Elaborator/clarifier	54	27.4%
					Encourager/reflector	58	29.4%
					Other	31	15.7%
Floor changing interruptions	52	6.2%	31.4	2.5 – 196.5	Change of subject	42	80.8%
					Elaborator/clarifier	10	19.2%

Opening statement non-backchannels (e.g. elaborators, correctors, or encouragers) occurred in 73 consultations (78%), with a median of 1 per consultation (range 0-11), or 2 per minute (range 0-22).

In 52 consultations (55%), the consultant interrupted the patient in such a way that the floor changed before the patient had signalled completion. Opening statements with a floor changing interruption lasted significantly shorter than those without (median 31.4 seconds, IQR 15.2-47.2 vs. median 51.5, IQR 22.9-80.1 seconds, p=0.004).

Relationship between interruptions and consulting physician and patient factors

A statistically significant negative correlation was found between the age of consultants and the number of opening statement interruptions they made per minute (Spearman's rank correlation coefficient ρ=-0.230, p=0.026). Female consultants used significantly more opening statement backchannels per minute (median 9, IQR 5-12) than did male consultants (median 7, IQR 2-11) (p=0.028). There were no statistically significant relationships between consultant or patient factors and the timing of opening statement interruptions.

The four paediatricians made considerably fewer floor changing interruptions (20% of opening statements ended with a floor changing interruption) than consultants of other specialties (62%) (p=0.003). In the non-paediatric consultations, we found no significant relationship between floor changing interruptions and the consulting physician's gender, age, or specialty, or the age and gender of the patient.

Discussion

Although nearly all consulting physicians in this study interrupted their patients during the opening statement, they did so with a variety of interruptions (table 1). Consultants interrupted their patients a median of 9 times per minute, and the median time to first interruption was 6.5 s. However, a third of these interruptions were backchannels like “hm-hm” or “I see”, which encouraged patients to continue their opening statement. Still, the majority of opening statements (55%) were not completed, due to a floor changing interruption made by the consultant. The median time to an interruption which caused a floor change was 31.4 seconds, considerably longer than previously reported in the literature[8,20,21,23].

Strengths and weaknesses

The main strength of this study is the nuanced and more detailed perspective on interruptions in medical consultations and their effects on patients. This study is also the first to analyse interruption practices of hospital-based consultants from various disciplines. The main limitation of this study is the use of data from one hospital only. The generalisability of our findings in different settings and countries should be examined in further research.

Relation to other studies

The recent insight that interruptions come in different types complicates the interpretation of earlier studies of interruptions in consultations. In our study, we carefully distinguished between different types of interruptions, following recommendations from recent communication literature, and examined the effects of these interruptions on the floor of the conversation between patient and consultant. Our results nuance the assumption that all interruptions have a negative effect [25–27], and confirm earlier assertions that interruptions can also have supportive[28] and affirming[32] functions.

The proportion of floor changing interruptions in our study (55%) was lower than was shown in three previous studies reporting incomplete opening statements in 68-74% of consultations[8,20,23]. On average, consultants interrupted patients later (at 31.4 s) than in previous literature (11-23 s)[8,20,21,23], and the difference between a finished and prematurely interrupted (by floor changing interruption) opening statement was longer in this research (20 s) than previously reported (3.9-6 s)[8,23]. These differences are likely explained by a difference in the definitions used for ‘interruptions’. In contrast to earlier studies, in which interruptions were defined by form or content, we classified interruptions by their effect, i.e. a floor change. For example, an ‘elaborator’ (e.g. “So your question to me is…?”) was considered to end the opening statement in previous studies[8,20,23], whereas we only recorded it as such when it also changed the floor. The differences may also be explained by a different research setting (hospital-based consults vs. general practice) or may represent the effects of patient-centred communication training.

Our results confirm previous literature on communication differences between male and female consultants and between consultants of different ages[27,33]. Female consultants tend to use more backchannels than their male colleagues[24,25,27,33]. Younger consultants made more opening statement interruptions than did older consultants, which has been interpreted in earlier studies as an effect of training level and experience[24,34]. A surprising and new finding was that the paediatricians in this study made far less floor changing interruptions than the other consultants. We hypothesise that this is related to the triadic nature of paediatric consultations. Further studies are needed to corroborate these findings.

Implications

The results of the present study paint a nuanced picture of how hospital consultants interrupt patients during their opening statements. Although interruptions occur very frequently, most of these are non-intrusive (e.g. backchannels) and do not hinder the patient in presenting his or her opening statement. However, our study also shows floor changing interruptions in more than half of consultations, which do hinder the patient. The risks of such floor changing interruptions include a loss of patient trust[15], loss of information[7] and paradoxical loss of time due to late arising complaints[5,8,9]. Training physicians in communication skills should include attention to the adverse effects of interruptions other than backchannels, and studies are needed to explore the effect of interventions aimed at reducing physicians' tendency to use floor changing interruptions in consultations with patients.

Conclusion

Patients are regularly interrupted by consultants during their opening statement of a consultation in medical specialist outpatient care. However, most interruptions are backchannels which appear to be encouraging rather than intrusive. Premature and undesired floor changing interruptions were observed in half of the consultations. Future research into interruptions during consultations requires nuance to account for the variation in different types of interruptions.

Legend to figure 1

Classification of types of interruptions by consulting physicians during the patient's opening statement.

Ethics approval

Isala hospital's medical ethical review board approved this study (file number 180706). Participating patients and consultants gave written informed consent.

Contributor statement

Inge Mulder-Vos performed data analysis, contributed to data interpretation, wrote the initial report and contributed to editing the final report.

Ellen Driever contributed to study design, performed data collection, contributed to data analysis and interpretation, and edited the report.

Paul Brand contributed to study design, supervised data collection, contributed to data analysis and interpretation, and edited the report. He is the guarantor of this manuscript. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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Competing interests

We declare no competing interests.

Data sharing statement

The data used and/or analysed during the current study are available from the corresponding author on reasonable request.

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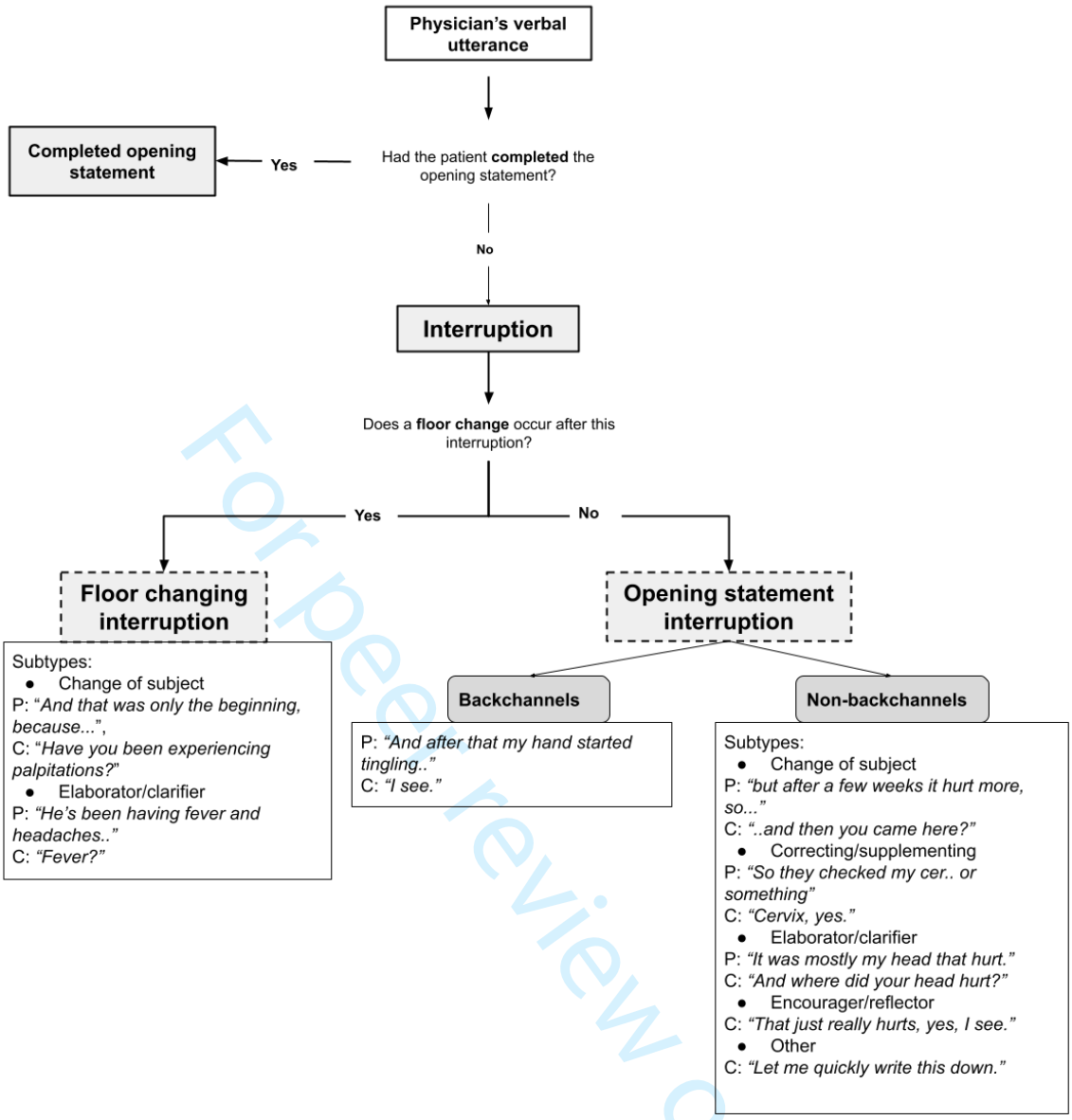

Figure 1. Classification of types of interruptions by consulting physicians during the patient's opening statement

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract (page 2)
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found (page 2)
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported (page 3)
Objectives	3	State specific objectives, including any prespecified hypotheses (page 3)
Methods		
Study design	4	Present key elements of study design early in the paper (page 4)
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection (page 4)
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants (page 4)
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable (page 4)
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group (page 4)
Bias	9	Describe any efforts to address potential sources of bias (page 4)
Study size	10	Explain how the study size was arrived at (page 4)
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why (page 4)
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding (page 4)
		(*b*) Describe any methods used to examine subgroups and interactions (not applicable)
		(*c*) Explain how missing data were addressed (not applicable)
		(*d*) If applicable, describe analytical methods taking account of sampling strategy (not applicable)
		(*e*) Describe any sensitivity analyses (not applicable)
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (page 6)
		(b) Give reasons for non-participation at each stage (page 6)
		(c) Consider use of a flow diagram (figure)
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (page 6)
		(b) Indicate number of participants with missing data for each variable of interest (page 6)
Outcome data	15*	Report numbers of outcome events or summary measures (page 6-7)
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were

		adjusted for and why they were included (page 6-7)
		(*b*) Report category boundaries when continuous variables were categorized (pasge 6-7)
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period (not applicable)
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses (page 7)
Discussion		
Key results	18	Summarise key results with reference to study objectives (page 8)
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias (page 8)
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence (page 8)
Generalisability	21	Discuss the generalisability (external validity) of the study results (page 8)
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based (page 9)

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Setting Isala teaching hospital in Zwolle, the Netherlands.

Participants 94 consultations by 27 consultants, video recorded in 2018 and 2019.

Main outcome measures Physicians' verbal interruptions during patients' opening statements, rate of completion of patients' opening statements, time to first interruption, and the effect of gender, age and physician specialty on the rate and type of physicians' verbal interruptions.

Results Patients were interrupted a median of 9 times per minute during their opening statement, the median time to first interruption was 6.5 s. Most interruptions (67%) were backchannels (such as "hm hm" or "go on"), considered to be encouraging the patient to continue. In 52 consultations (55%), patients could not finish their opening statement due to a floor changing interruption by the consultant. The median time to such an interruption was 31.4 seconds, on average 20 seconds shorter than a finished opening statement (p=0.004). Female consultants used more backchannels (median 9, interquartile range [IQR] 5 to 12) than male consultants (median 7, IQR 2 to 11, p=0.028).

Conclusions Hospital-based consultants use various ways to interrupt patients during their opening statements. Most of these interruptions are encouraging backchannels. Still, consultants change the conversational floor in more than half of their patients during their opening statements after a median of 31 seconds.

Introduction

Despite increasing attention to patient-centred communication, patients still complain that doctors do not listen enough, insufficiently address their concerns, and interrupt them when they present their concerns or complaints[1,2]. A major cause for these shortcomings could lie in the time pressure consultants perceive[3], and subsequent strategies they have developed to cope with this, for example, controlling the length of the consultation by interrupting patients[4]. By limiting patients in the time and space given to discuss their complaints, consultants risk missing out on crucial information. Research has shown that patients commonly have multiple complaints to discuss[5,6], and that, when interrupted, they take on a more passive role[7], potentially causing important information to remain unmentioned. In addition, although intended to reduce the time spent in consultation, there are two reasons why interruptions may also have the opposite effect. Firstly, interruptions may lead to 'doorknob complaints' being presented towards the end of the consultation[5,8,9]. Secondly, the use of interruptions by physicians has been shown to increase the amount patients tal as well, possibly in an attempt to regain some level of control in the conversation[10].

The opening of the consultation lays the foundation of a trusting patient-physician relationship, which can contribute to improving patients' health[11-13]. The opening statement is commonly the only time in the consultation when patients are given the 'floor'[14]. Patients appreciate being given the opportunity to explain their complaints in their own words[14]. Interrupting the patient's opening statement can harm the process of building this relationship of mutual trust[15,16], limit the already asymmetric position of the patient in the consultation[17–19], and may come across as rejection to patients who already indicate that fear of rejection is a reason for them not to share everything they would like to[20].

Research, mostly in the general practice setting, has shown that physicians interrupt their patients' opening statements in 70% of consultations and very early into the consultation, on average after 12 seconds[8,21–25]. Little is known on interruptions in consultations by hospital-based consultants, who constitute the majority of physicians. In addition, most interruption studies have been performed more than 10 years ago. In view of the increased attention to patient-centred communication in medical curricula and the lay press, the available literature may therefore not represent current medical practice regarding interruption of patients during their opening statement. Finally, the currently available literature on interruptions in medical consultations rarely distinguishes between different types of interruptions, which may be relevant because recent studies have shown that not all interruptions have a negative effect[26–29], and that some interruptions may also have supportive[30] and affirming[29,31] functions in the consultation.

The aim of the present study was to analyse hospital consultants' verbal interruption behaviour during the opening statement of their patients, considering various forms of interruptions and their effects on the doctor-patient consultation.

Methods

We analysed a sample of consultations from an existing repository of 781 video-recorded consultations with 41 consultants at Isala Hospital, Zwolle, The Netherlands, an 1100-bed general teaching hospital serving a mixed urban-rural population of approximately 600 000 people[31].

Consultations in which new patients (or caregiver with children aged 12 years or younger) were given the opportunity to discuss their opening statement were included. Consultations with a significant language barrier were excluded. Gender and age of included patients and consultants were collected, as well as medical specialty of consultants. These were used to investigate the relationship between such patient and physician factors and the occurrence of interruptions.

Every utterance of the consulting physician during the patient's opening statement was considered and will be referred to as an 'interruption. Therefore, it was deemed possible that these so-called interruptions had a negative, neutral or positive effect and calling it an 'interruption was merely a methodical act, not a judgment in itself. This also meant that for an utterance to be called an 'interruption', it was not our requirement that it had overlap with an utterance of the other speaker. The opening statement was defined as the time during which the patient discussed his or her reason for coming, starting with the patient's first words on this subject, ending when the consultant received or took the floor. An opening statement was considered completed when (a) the patient communicated its completion (e.g., "*that's it*" or "*that's why I've come here*"), (b) responded positively to the consultant's closing question (e.g., patient: "*I guess I wanted to know whether it could be treated*.", consultant: "*That seems like a reasonable question, right?*", patient**:** "*Yes, I think so too.*") or (c) when the consultant took over the floor (e.g., patient: "*And that was only the beginning, because...*", consultant: "*Have you been experiencing palpitations?*").

We distinguished interruptions by which the consultant took the floor from the patient (floor changing interruptions) from interruptions in which the floor remained with the patient (opening statement interruptions). Opening statement interruptions were classified as 'backchannels' (utterances such as *"hm-hm"*, *"yes"* or *"go on"*, which most communication researchers consider to be non-intrusive encouragements for the patient to continue speaking[10,30]) and non-backchannels (for example, utterances prompting a change of subject, a correction, a clarification, or a reflection on patients' accounts of their symptoms, see figure 1).

Figure 1. Classification of types of interruptions by consulting physicians during the patient's opening statement

The time to interruption was measured as the time between the start of the opening statement and the first interruption of that type, by using the video time stamp.

Statistical analyses were performed using non-parametric methods, due to non-normally distributed continuous variables, in SPSS Statistics 27. Based on previous studies assessing how often patients can complete their opening statement without interruptions[9, 22-25], aiming for a power of 0.8 (with an alpha set at 0.05), we calculated the required number of consultations at 66 using a binomial test. To allow for consultations to be excluded for technical failures or practical reasons (e.g., extensive small talk or intrusions at the beginning of a consultation, disturbing the presentation of an opening

statement), we aimed to include at least 90 consultations, which we randomly selected from the consultations which met our inclusion and exclusion criteria listed above.

Ethical aspects

The hospital's ethics review board approved this study (file number 200308). Participating patients and consultants gave written informed consent.

Results

Demographics

Medical specialty	N (consultants)	N (consultations)
Cardiology	1	1 (1.1%)
General surgery	1	2 (2.1%)
OB&GYN	3	12 (12.8%)
Paediatrics	4	15 (16.0%)
ENT	3	12 (12.8%)
Pulmonology	1	2 (2.1%)
Gastroenterology	1	3 (3.2%)
Neurosurgery	1	4 (4.3%)
Neurology	2	7 (7.4%)
Ophthalmology	1	3 (3.2%)
Orthopaedics	1	2 (2.1%)
Plastic Surgery	2	8 (8.5%)
Rheumatology	2	8 (8.5%)
Sports medicine	2	8 (8.5%)
Urology	2	7 (7.4%)
Total	27	94 (100%)

Table 1: specialty of the consultants in the 94 included consultations

Most of the 781 consultations in the repository were follow-up consultations of patients with a chronic disease. There were 212 consultations with a new patient, 122 of which met the inclusion and exclusion criteria. A total of 94 consultations by 27 consultants (maximum 4 per consultant) from 15 disciplines (see table 1) were randomly selected for analysis from these 122. Patients' ages ranged from 0 to 88 (median 41) years; 54% were women. Consultants' ages ranged from 36 to 63 (median 47) years; 34 were women (36%).

Interrater agreement

The first ten consultations were analysed by two investigators, who independently classified all interruptions as outlined in figure 1. They agreed on floor change occurrence and on subtyping into backchannels and non-backchannels in 8 and 9 consultations, respectively[32]. Differences between the two investigators were discussed and resolved by consensus. The remaining consultations were analysed by one investigator.

Interruptions

Overall, 840 interruptions were recorded, 788 of which were non-floor changing and hence referred to as opening statement interruptions, a median of 7 per consultation (range 0-40)(figure 2), or 9 per minute (range 0-43)(figure 2). In only one consultation, the consultant made no interruptions during the patient's opening statement, which the patient completed after 9.8 seconds.

The non-floor changing opening statement interruptions were classified into 5 subtypes (table 2). Most interruptions were backchannels, with a median of 5 per consultation (range 0-29), or 8 per minute (range 0-35). Backchannel interruptions occurred in 89 consultations (95%).

Figure 2: Frequency plot of opening statement interruptions (panel A) and backchannels (panel B). Black bars represent the number of interruptions or backchannels per consultation, white bars represent the number of interruptions or backchannels per minute.

Table 2. Frequencies and percentages of the types of interruptions.

	N	%	Time to interruption/completion			Type of content		
			Median (seconds)	Range (seconds)	Interquartile range (seconds)	Name	N	%
Opening statement backchannels	591	70.4%	6.5	0 – 83.9	6.1	-	-	-
Opening statement non-backchannels	197	23.5%	18.5	0 – 86.5	23.3	Change of subject	7	3.6%
						Correcting/ supplementing	47	23.9%
						Elaborator/clarifier	54	27.4%
						Encourager/reflector	58	29.4%
						Other	31	15.7%
Floor changing interruptions	52	6.2%	31.4	2.5 – 196.5	31.6	Change of subject	42	80.8%
						Elaborator/clarifier	10	19.2%

Opening statement non-backchannels (i.e. elaborators, correctors, or encouragers) occurred in 73 consultations (78%), with a median of 1 per consultation (range 0-11), or 2 per minute (range 0-22).

In 52 consultations (55%), the consultant interrupted the patient in such a way that the floor changed before the patient had signalled completion. Opening statements with a floor changing interruption lasted significantly shorter than those without (median 31.4 seconds, IQR 15.2-47.2 vs. median 51.5, IQR 22.9-80.1 seconds, p=0.004).

Relationship between interruptions and consulting physician and patient factors

We assessed the relationship between interruptions and physician factors such as age, gender and medical specialty, as well as between interruptions and patient factors such as age and gender. A statistically significant negative correlation was found between the age of consultants and the number of opening statement interruptions they made per minute (Spearman's rank correlation coefficient ρ=-0.230, p=0.026). Female consultants used significantly more opening statement backchannels per minute (median 9, IQR 5-12) than did male consultants (median 7, IQR 2-11) (p=0.028). There were no statistically significant relationships between consultant or patient factors and the timing of opening statement interruptions.

The four paediatricians made considerably fewer floor changing interruptions (20% of opening statements ended with a floor changing interruption) than consultants of other specialties (62%) (p=0.003). In the non-paediatric consultations, we found no significant relationship between floor changing interruptions and the consulting physician's gender, age, or specialty, or the age and gender of the patient.

Discussion

Although nearly all consulting physicians in this study interrupted their patients' opening statement, they did so with a variety of interruptions (table 1). Consultants interrupted their patients a median of 9 times per minute, and the median time to first interruption was 6.5 s. However, a third of these interruptions were backchannels like "hm-hm" or "I see", which encouraged patients to continue their opening statement. Still, the majority of opening statements (55%) were not completed, due to a floor changing interruption made by the consultant. Such floor changing interruptions were associated with a (median 20 s) shorter opening statement. The median time to an interruption which caused a floor change was 31.4 seconds, considerably longer than previously reported in the literature[8,21 22,24].

The recent insight that interruptions come in different types complicates the interpretation of earlier studies of interruptions in consultations. In our study, we carefully distinguished between different types of interruptions, following recommendations from recent communication literature, and examined the effects of these interruptions on the floor of the conversation between patient and consultant. Our results nuance the assumption that all interruptions have a negative effect[26–28], and confirm earlier assertions that interruptions can also have supportive[30] and affirming[33,34] functions. The proportion of floor changing interruptions in our study (55%) was lower than was shown in three previous studies reporting incomplete opening statements in 68-74% of consultations[8,21,24]. On average, consultants interrupted patients later (at 31.4 s) than in previous literature (11-23 s[8,21, 22,24]) and the difference between a finished and prematurely interrupted (by floor changing interruption) opening statement was longer in this research (20 s) than previously reported (3.9-6 s[8,24]).

The differences between our results and those reported by previous literature are likely explained by a difference in the definitions used for 'interruptions'. In contrast to earlier studies, in which interruptions were defined by form or content, we classified interruptions by their effect, i.e., a floor change. For example, an 'elaborator' (e.g., "So your question to me is…?") was considered to end the opening statement in previous studies[8,21,24], whereas we only decided to record it as such when it also changed the floor. The differences may also be explained by a different research setting (hospital-based consults vs. general practice) or could reflect the effects of patient-centred communication training.

Our results confirm previous literature on communication differences between male and female consultants and between consultants of different ages[28, 29,35]. Female consultants tend to use more backchannels than their male colleagues[25, 26,28,35]. Younger consultants made more opening statement interruptions than did older consultants, which has been interpreted in earlier studies as an effect of training level and experience[25,36]. A surprising and new finding was that the paediatricians in this study made considerably less floor changing interruptions than the other consultants. This may be related to the triadic nature of paediatric consultations, involving the caregivers as a third party.[37] It is also possible that paediatricians receive more training on involving both the child and the caregivers in the consultation, and hence provide more room for patient and

caregiver to present their opening statement without interruption. Further studies are needed to corroborate these findings.

Implications

The results of the present study paint a nuanced picture of how hospital consultants interrupt patients during their opening statements. Although interruptions occur very frequently, most of these are non-intrusive (e.g., backchannels) and do not hinder the patient in presenting his or her opening statement.[10,29] However, our study also shows floor changing interruptions in more than half of consultations, which do hinder the patient. The risks of such floor changing interruptions include a loss of patient trust[16], loss of information[7] and paradoxical loss of time[10], for example due to late arising complaints[5,8,9]. Training physicians in communication skills should include attention to the adverse effects of interruptions other than backchannels, and studies are needed to explore the effect of interventions aimed at reducing physicians' tendency to use floor changing interruptions in consultations with patients.

Strengths and weaknesses

The main strength of this study is the nuanced and more detailed perspective on interruptions in medical consultations and their effects on patients. This study is also the first to analyse interruption practices of hospital-based consultants from various disciplines. We acknowledge the following limitations. Firstly, we have no data on the outcomes of the consultations or the patients' satisfaction with the consultation. Secondly, we did not examine the consultants' reasons for interrupting their patients. Thirdly, we used data from one hospital only. The generalisability of our findings in different settings and countries should be examined in further research.

Conclusion

Patients are regularly interrupted by consultants during their opening statement of a consultation in medical specialist outpatient care. However, most interruptions are backchannels which appear to be encouraging rather than intrusive. Premature and undesired floor changing interruptions were observed in half of the consultations. Future research into interruptions during consultations requires nuance to account for the variation in different types of interruptions.

Funding and conflict of interest

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors. We declare to have had no conflict of interest for this study.

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Author contribution statement

Inge Mulder-Vos contributed to study design, performed data collection and analysis, and wrote the initial report.

Ellen Driever contributed to study design, data collection and data analysis, and edited the report.

Paul Brand contributed to study design, supervised data collection and analysis, and edited the report. He is the guarantor of the study.

Patient and public involvement

Patients and public were not involved in the design and conduct of the study. All study participants received a summary of the study findings.

Data availability statement

All study data are available from the authors upon reasonable request.

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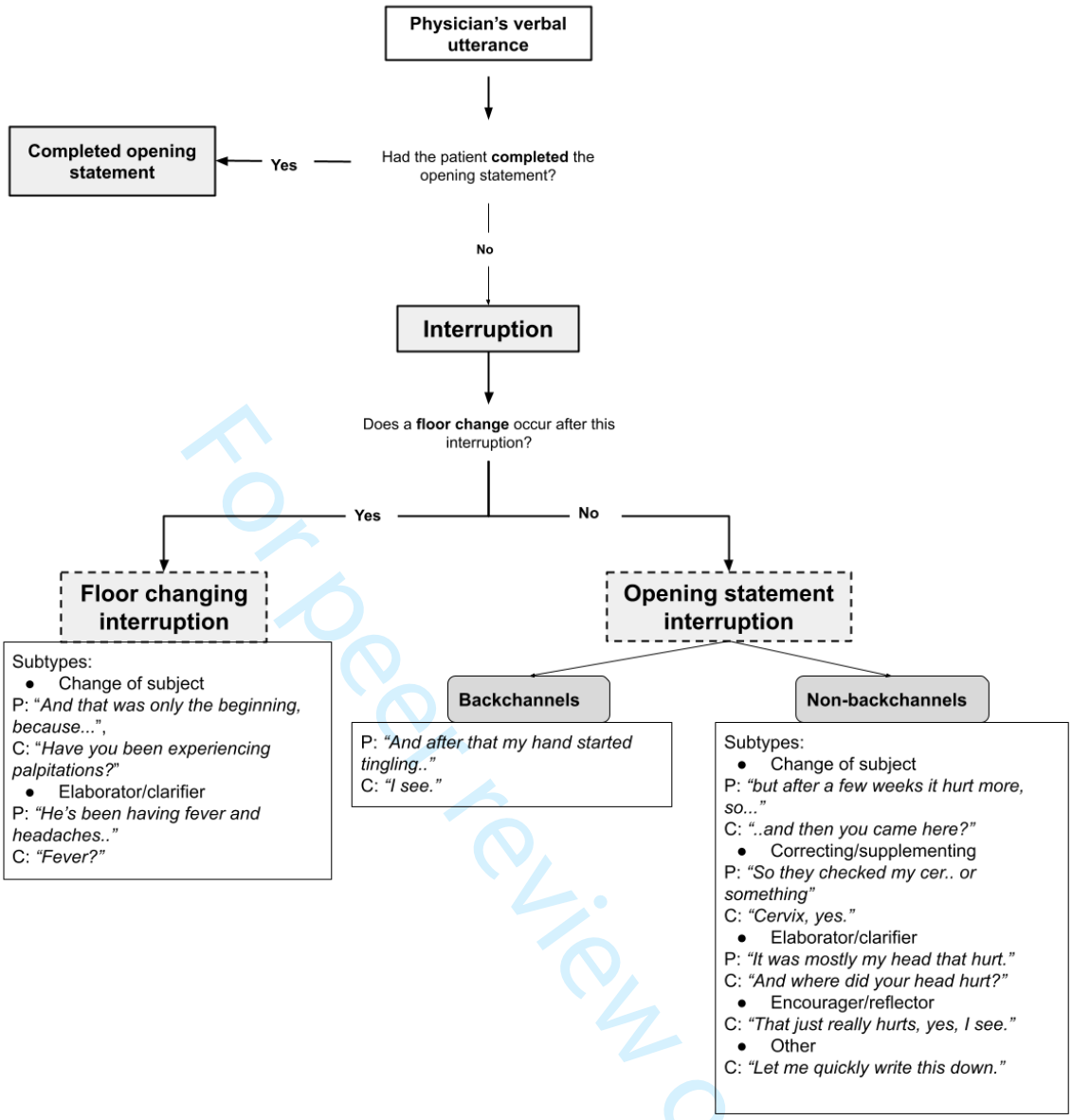
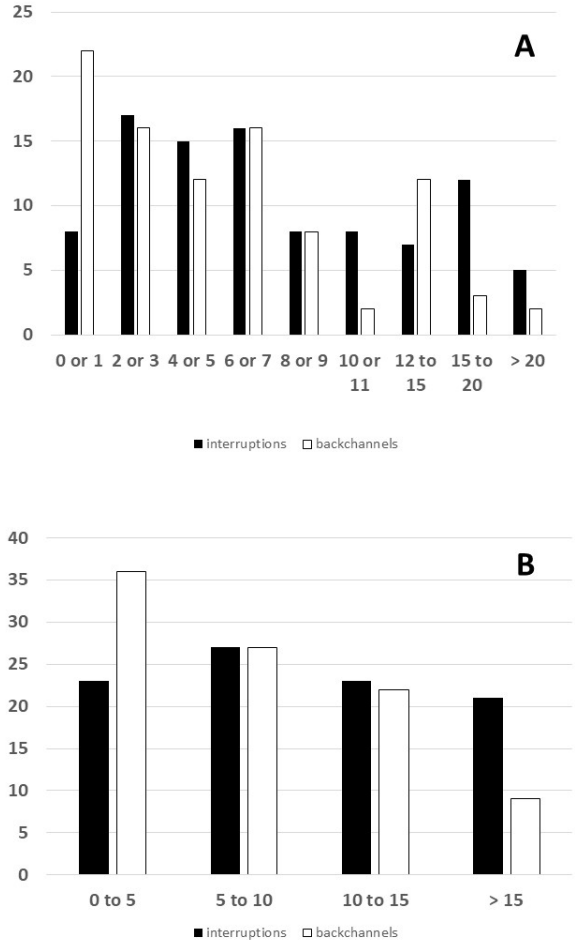


Figure 1. Classification of types of interruptions by consulting physicians during the patient's opening statement



Frequency plot of opening statement interruptions (panel A) and backchannels (panel B). Black bars represent the number of interruptions or backchannels per consultation, white bars represent the number of interruptions or backchannels per minute.

190x338mm (96 x 96 DPI)

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract (page 2)
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found (page 2)
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported (page 3)
Objectives	3	State specific objectives, including any prespecified hypotheses (page 3)
Methods		
Study design	4	Present key elements of study design early in the paper (page 4)
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection (page 4)
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants (page 4)
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable (page 4)
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group (page 4)
Bias	9	Describe any efforts to address potential sources of bias (page 4)
Study size	10	Explain how the study size was arrived at (page 4)
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why (page 4)
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding (page 4)
		(*b*) Describe any methods used to examine subgroups and interactions (not applicable)
		(*c*) Explain how missing data were addressed (not applicable)
		(*d*) If applicable, describe analytical methods taking account of sampling strategy (not applicable)
		(*e*) Describe any sensitivity analyses (not applicable)
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (page 6)
		(b) Give reasons for non-participation at each stage (page 6)
		(c) Consider use of a flow diagram (figure)
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (page 6)
		(b) Indicate number of participants with missing data for each variable of interest (page 6)
Outcome data	15*	Report numbers of outcome events or summary measures (page 6-7)
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were

		adjusted for and why they were included (page 6-7)
		(*b*) Report category boundaries when continuous variables were categorized (pasge 6-7)
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period (not applicable)
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses (page 7)
Discussion		
Key results	18	Summarise key results with reference to study objectives (page 8)
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias (page 8)
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence (page 8)
Generalisability	21	Discuss the generalisability (external validity) of the study results (page 8)
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based (page 9)

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Observational study on the timing and method of interruption by hospital consultants during the opening statement in outpatient consultations

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Observational study on the timing and method of interruption by hospital consultants during the opening statement in outpatient consultations.

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Abstract

Objective To analyse verbal interruptions by Dutch hospital consultants during the patient's opening statement in medical encounters.

Design Cross-sectional descriptive study.

Setting Isala teaching hospital in Zwolle, the Netherlands.

Participants 94 consultations by 27 consultants, video recorded in 2018 and 2019.

Main outcome measures Physicians' verbal interruptions during patients' opening statements, rate of completion of patients' opening statements, time to first interruption, and the effect of gender, age and physician speciality on the rate and type of physicians' verbal interruptions.

Results Patients were interrupted a median of 9 times per minute during their opening statement, the median time to the first interruption was 6.5 s. Most interruptions (67%) were backchannels (such as "hm hm" or "go on"), considered to be encouraging the patient to continue. In 52 consultations (55%), patients could not finish their opening statement due to a floor changing interruption by the consultant. The median time to such an interruption was 31.4 seconds, on average 20 seconds shorter than a finished opening statement (p=0.004). Female consultants used more backchannels (median 9, interquartile range [IQR] 5 to 12) than male consultants (median 7, IQR 2 to 11, p=0.028).

Conclusions Hospital-based consultants use various ways to interrupt patients during their opening statements. Most of these interruptions are encouraging backchannels. Still, consultants change the conversational floor in more than half of their patients during their opening statements after a median of 31 seconds.

Strengths and limitations of this study

- To our knowledge, the first study of interruptions by hospital-based consultants during their patients' opening statements
- Distinguished between different types of interruptions based on their effects
- Comparison to earlier studies complicated by adapted definition of interruption used in this study
- Limited generalisability because study was performed in one hospital only

Data availability statement

All study data are available from the corresponding author upon reasonable request.

Contributorship statement

Inge Mulder-Vos contributed to study design, performed data collection and analysis, and wrote the initial report.

Ellen Driever contributed to study design, data collection and data analysis, and edited the report.

Paul Brand contributed to study design, supervised data collection and analysis, and edited the report. He is the guarantor of the study.

Introduction

Despite increasing attention to patient-centred communication, patients still complain that doctors do not listen enough, insufficiently address their concerns, and interrupt them when they present their concerns or complaints.[1,2] A major cause for these shortcomings could lie in the time pressure consultants perceive and in the subsequent strategies they have developed to cope with this, for example, controlling the length of the consultation by interrupting patients.[3,4] By limiting patients in the time and space given to discuss their complaints, consultants risk missing out on crucial information. Research has shown that patients commonly have multiple complaints to discuss,[5,6] and that, when interrupted, they take on a more passive role,[7] potentially causing important information to remain unmentioned. In addition, although intended to reduce the time spent in consultation, there are two reasons why interruptions may also have the opposite effect. Firstly, interruptions may lead to 'doorknob complaints' being presented towards the end of the consultation.[5,8,9] Secondly, the use of interruptions by physicians has also been shown to increase the amount of time patients use, possibly in an attempt to regain some level of control in the conversation.[10]

The opening of the consultation lays the foundation of a trusting patient-physician relationship, which can contribute to improving patients' health.[11-13] The opening statement is commonly the only time in the consultation when patients are given the 'floor'.[14,15] Patients appreciate being given the opportunity to explain their complaints in their own words.[14] Interrupting the patient's opening statement can harm the process of building this relationship of mutual trust,[16,17] limit the already asymmetric position of the patient in the consultation,[18-20] and may come across as rejection to patients who already indicate that fear of rejection is a reason for them not to share everything they would like to.[21]

Research, mostly in the general practice setting, has shown that physicians interrupt their patients' opening statements in 70% of consultations and very early into the consultation, on average after 12 seconds.[8,22-26] Little is known about interruptions in consultations by hospital-based consultants, who constitute the majority of physicians. In addition, most interruption studies have been performed more than 10 years ago. Given the increased attention to patient-centred communication in medical curricula and the lay press, the available literature may therefore not represent current medical practice regarding the interruption of patients during their opening statement. Finally, the currently available literature on interruptions in medical consultations rarely distinguishes between different types of interruptions, which may be relevant because recent studies have shown that not all interruptions have a negative effect, [27-30] and that some interruptions may also have supportive and affirming functions in the consultation.[30-32]

The present study aimed to analyse hospital consultants' verbal interruption behaviour during the opening statement of their patients, considering various forms of interruptions and their effects on the doctor-patient consultation.

Methods

We analysed a sample of consultations from an existing repository of 781 video-recorded consultations with 41 consultants at Isala Hospital, Zwolle, The Netherlands, an 1100-bed general teaching hospital serving a mixed urban-rural population of approximately 600 000 people.[33]

Consultations in which new patients (or caregivers with children aged 12 years or younger) were given the opportunity to discuss their opening statement were included. Consultations with a significant language barrier were excluded. The gender and age of included patients and consultants were collected, as well as the medical speciality of consultants. These were used to investigate the relationship between such patient and physician factors and the occurrence of interruptions.

Every utterance of the consulting physician during the patient's opening statement was considered and will be referred to as an 'interruption. Therefore, it was deemed possible that these so-called interruptions had a negative, neutral or positive effect and calling it an 'interruption was merely a methodical act, not a judgment in itself. This also meant that for an utterance to be called an 'interruption', it was not our requirement that it had overlap with an utterance of the other speaker. The opening statement was defined as the time during which the patient discussed his or her reason for coming, starting with the patient's first words on this subject, and ending when the consultant received or took the floor. We used Edelsky's definition of floor as "the acknowledged what's-going-on within a psychological time/space. What's going on can be the development of a topic or a function (teasing, soliciting a response, etc.) or an interaction of the two. It can be developed or controlled by one person at a time or by several simultaneously or in quick succession."[25] An opening statement was considered completed when (a) the patient communicated its completion (e.g., "*that's it*" or "*that's why I've come here*"), (b) responded positively to the consultant's closing question (e.g., patient: "*I guess I wanted to know whether it could be treated*.", consultant: "*That seems like a reasonable question, right?*", patient**:** "*Yes, I think so too.*") or (c) when the consultant took over the floor (e.g., patient: "*And that was only the beginning, because…*", consultant: "*Have you been experiencing palpitations?*").

We distinguished interruptions by which the consultant took the floor from the patient (floor changing interruptions) from interruptions in which the floor remained with the patient (opening statement interruptions). Opening statement interruptions were classified as 'backchannels' (utterances such as *"hm-hm"*, *"yes"* or *"go on"*, which most communication researchers consider to be non-intrusive encouragements for the patient to continue speaking,[10,31] and non-backchannels (for example, utterances prompting a change of subject, a correction, a clarification, or a reflection on patients' accounts of their symptoms, see figure 1 and table 1).

Figure 1 here

Figure 1. Classification of types of interruptions by consulting physicians during the patient's opening statement

Table 1: Definitions of types of interruptions.

Terminology	Definition
Floor-changing interruption	A statement, made by the physician, which interrupts the patient's opening statement in such a way that it takes the floor away from the patient and therefore ends the opening statement.
Backchannel	A verbal, sometimes non-verbal, interjection by one of two or more participants in the conversation, generally serving a meta-conversational purpose of showing interest, understanding or sympathy, such as 'yeah', 'hmm', or 'I see', very short phrases without significantly impacting the floor.
Opening statement backchannel	A backchannel utterance, made by the physician during the patient's opening statement, which does not affect the floor, leaving it with the patient.
Opening statement non-backchannel	An utterance, made by the physician during the patient's opening statement, which cannot be classified as a backchannel, but leaves the floor with the patient.

The time to interruption was measured as the time between the start of the opening statement and the first interruption of that type, by using the video time stamp.

Statistical analyses were performed using non-parametric methods, due to non-normally distributed continuous variables, in SPSS Statistics 27. Based on previous studies assessing how often patients can complete their opening statement without interruptions,[9,23-26] aiming for a power of 0.8 (with an alpha set at 0.05), we calculated the required number of consultations at 66 using a binomial test. To allow for consultations to be excluded for technical failures or practical reasons (e.g., extensive small talk or intrusions at the beginning of a consultation, disturbing the presentation of an opening statement), we aimed to include at least 90 consultations, which we randomly selected from the consultations which met our inclusion and exclusion criteria listed above.

Patient and public involvement

Patients and public were not involved in the design and conduct of the study.

Ethical aspects

The hospital's ethics review board approved this study (file number 200308). Participating patients and consultants gave written informed consent.

Results

Demographics

Medical speciality	N (consultants)	N (consultations)
Cardiology	1	1 (1.1%)
General surgery	1	2 (2.1%)
OB&GYN	3	12 (12.8%)
Paediatrics	4	15 (16.0%)
ENT	3	12 (12.8%)
Pulmonology	1	2 (2.1%)
Gastroenterology	1	3 (3.2%)
Neurosurgery	1	4 (4.3%)
Neurology	2	7 (7.4%)
Ophthalmology	1	3 (3.2%)
Orthopaedics	1	2 (2.1%)
Plastic Surgery	2	8 (8.5%)
Rheumatology	2	8 (8.5%)
Sports medicine	2	8 (8.5%)
Urology	2	7 (7.4%)
Total	27	94 (100%)

Table 2: speciality of the consultants in the 94 included consultations

Most of the 781 consultations in the repository were follow-up consultations of patients with a chronic disease. There were 212 consultations with a new patient, 122 of which met the inclusion and exclusion criteria. A total of 94 consultations by 27 consultants (maximum 4 per consultant) from 15 disciplines (see table 2) were randomly selected for analysis from these 122. Patients' ages ranged from 0 to 88 (median 41) years; 54% were women. Consultants' ages ranged from 36 to 63 (median 47) years; 34 were women (36%).

Interrater agreement

The first ten consultations were analysed by two investigators, who independently classified all interruptions as outlined in figure 1. They agreed on floor change occurrence and on subtyping into backchannels and non-backchannels in 8 and 9 consultations, respectively.[34] Differences between the two investigators were discussed and resolved by consensus. The remaining consultations were analysed by one investigator.

Interruptions

Overall, 840 interruptions were recorded, 788 of which were non-floor changing and hence referred to as opening statement interruptions, a median of 7 per consultation (range 0-40)(figure 2), or 9 per minute (range 0-43)(figure 2). In only one consultation, the consultant made no interruptions during the patient's opening statement, which the patient completed after 9.8 seconds.

The non-floor changing opening statement interruptions were classified into 5 subtypes (table 3). Most interruptions were backchannels, with a median of 5 per consultation (range 0-29), or 8 per minute (range 0-35). Backchannel interruptions occurred in 89 consultations (95%).

Figure 2 here

Figure 2: Frequency plot of opening statement interruptions (panel A) and backchannels (panel B). Block bars represent the number of interruptions or backchannels per consultation, white bars represent the number of interruptions or backchannels per minute.

Table 3. Frequencies and percentages of the types of interruptions.

	N	%	Time to interruption/completion			Type of content		
			Median (seconds)	Range (seconds)	Interquartile range (seconds)	Name	N	%
Opening statement backchannels	591	70.4%	6.5	0 – 83.9	6.1	-	-	-
Opening statement non-backchannels	197	23.5%	18.5	0 – 86.5	23.3	Change of subject	7	3.6%
						Correcting/ supplementing	47	23.9%
						Elaborator/clarifier	54	27.4%
						Encourager/reflector	58	29.4%
						Other	31	15.7%
Floor changing interruptions	52	6.2%	31.4	2.5 – 196.5	31.6	Change of subject	42	80.8%
						Elaborator/clarifier	10	19.2%

Opening statement non-backchannels (i.e. elaborators, correctors, or encouragers) occurred in 73 consultations (78%), with a median of 1 per consultation (range 0-11), or 2 per minute (range 0-22).

In 52 consultations (55%), the consultant interrupted the patient in such a way that the floor changed before the patient had signalled completion. Opening statements with a floor changing interruption lasted significantly shorter than those without (median 31.4 seconds, IQR 15.2-47.2 vs. median 51.5, IQR 22.9-80.1 seconds, p=0.004).

Relationship between interruptions and consulting physician and patient factors

We assessed the relationship between interruptions and physician factors such as age, gender and medical speciality, as well as between interruptions and patient factors such as age and gender. A statistically significant negative correlation was found between the age of consultants and the number of opening statement interruptions they made per minute (Spearman's rank correlation coefficient ρ=-0.230, p=0.026). Female consultants used significantly more opening statement backchannels per minute (median 9, IQR 5-12) than male consultants (median 7, IQR 2-11) (p=0.028). There were no statistically significant relationships between physician or patient factors and the timing of opening statement interruptions.

The four paediatricians made considerably fewer floor changing interruptions (20% of opening statements ended with a floor changing interruption) than consultants of other specialities (62%, p=0.003). In the non-paediatric consultations, we found no significant relationship between floor changing interruptions and the consulting physician's gender, age, or speciality, or the age and gender of the patient.

Discussion

Although nearly all consulting physicians in this study interrupted their patients' opening statements, they did so with a variety of interruptions (tables 1 and 3). Consultants interrupted their patients a median of 9 times per minute, and the median time to the first interruption was 6.5 s. However, a third of these interruptions were backchannels like "hm-hm" or "I see", which encouraged patients to continue their opening statement. Still, the majority of opening statements (55%) were not completed due to a floor changing interruption made by the consultant. Such floor changing interruptions were associated with a (median 20 s) shorter opening statement. The median time to an interruption which caused a floor change was 31.4 seconds, considerably longer than previously reported in the literature.[8,22,23,25]

The recent insight that interruptions come in different types complicates the interpretation of earlier studies of interruptions in consultations. In our study, we carefully distinguished between different types of interruptions, following recommendations from recent communication literature, and examined the effects of these interruptions on the floor of the conversation between patient and consultant. Our results nuance the assumption that all interruptions have a negative effect,[27-29] and confirm earlier assertions that interruptions can also have supportive and affirming functions.[31,32] The proportion of floor changing interruptions in our study (55%) was lower than was shown in three previous studies reporting incomplete opening statements in 68-74% of consultations.[8,22,25] On average, consultants interrupted patients later (at 31.4 s) than in previous literature (11-23 s),[8,22,23,25] and the difference between a finished and prematurely interrupted (by floor changing interruption) opening statement was longer in this research (20 s) than previously reported (3.9-6 s).[8,25]
The differences between our results and those reported by previous literature are likely explained by different definitions used for 'interruptions'. In contrast to earlier studies, in which interruptions were defined by form or content, we classified interruptions by their effect, i.e. a floor change. For example, an 'elaborator' (e.g. "So your question to me is…?") was considered to end the opening statement in previous studies,[8,22,25] whereas we only decided to record it as such when it also changed the floor. The differences may also be explained by a different research setting (hospital-based consults vs. general practice) or could reflect the effects of patient-centred communication training.

Our results confirm previous literature on communication differences between male and female consultants and between consultants of different ages.[29,30,35] Female consultants tend to use more backchannels than their male colleagues.[26,27,29,36] Younger consultants made more opening statement interruptions than did older consultants, which has been interpreted in earlier studies as an effect of training level and experience.[26,37] A surprising and new finding was that the paediatricians in this study made considerably fewer floor changing interruptions than the other consultants. This may be related to the triadic nature of paediatric consultations, involving the caregivers as a third party.[38] It is also possible that paediatricians receive more training on involving both the child and the caregivers in the consultation, and hence provide more room for the patient and caregiver to present their opening statement without interruption. Further studies are needed to corroborate these findings.

Implications

The results of the present study paint a nuanced picture of how hospital consultants interrupt patients during their opening statements. Although interruptions occur very frequently, most of these are non-intrusive (e.g. backchannels) and do not hinder the patient in presenting his or her opening statement.[10,30] However, our study also shows floor changing interruptions in more than half of consultations, which do hinder the patient. The risks of such floor changing interruptions include a loss of patient trust,[17] loss of information and paradoxical loss of time,[7,10] for example due to late arising complaints.[5,8,9] Training physicians in communication skills should include attention to the adverse effects of interruptions other than backchannels, and studies are needed to explore the effect of interventions aimed at reducing physicians' tendency to use floor changing interruptions in consultations with patients.

Strengths and limitations

The main strength of this study is the nuanced and more detailed perspective on interruptions in medical consultations and their effects on patients. This study is also the first to analyse interruption practices of hospital-based consultants from various disciplines. We acknowledge the following limitations. Firstly, by taking a more nuanced and detailed methodological approach to the study of interruptions, the comparison of our results with those of previous studies is complicated. Secondly, we did not collect data on the outcomes of the consultations or the patients' satisfaction with the consultation or examine the consultants' reasons for interrupting their patients. Thirdly, we used data from one hospital only. The generalisability of our findings in different settings and countries should be examined in further research.

Conclusion

Patients are regularly interrupted by consultants during the opening statement of consultations in medical specialist outpatient care. However, most interruptions are backchannels which appear to be encouraging rather than intrusive. Premature and undesired floor changing interruptions were observed in half of the consultations. Future research into interruptions during consultations requires nuance to account for the variation in different types of interruptions.

Funding and conflict of interest

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors. We declare to have had no conflict of interest for this study.

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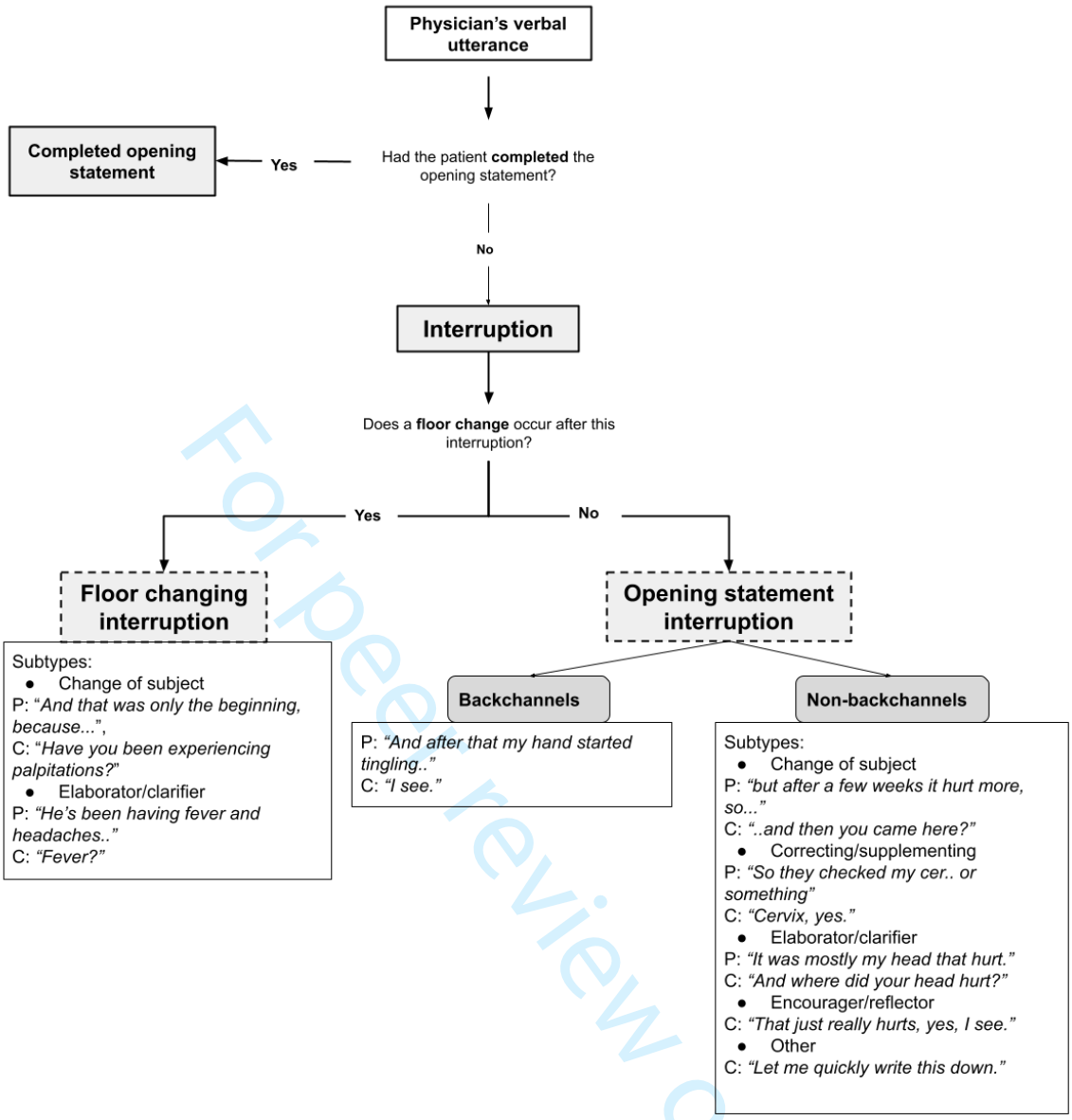
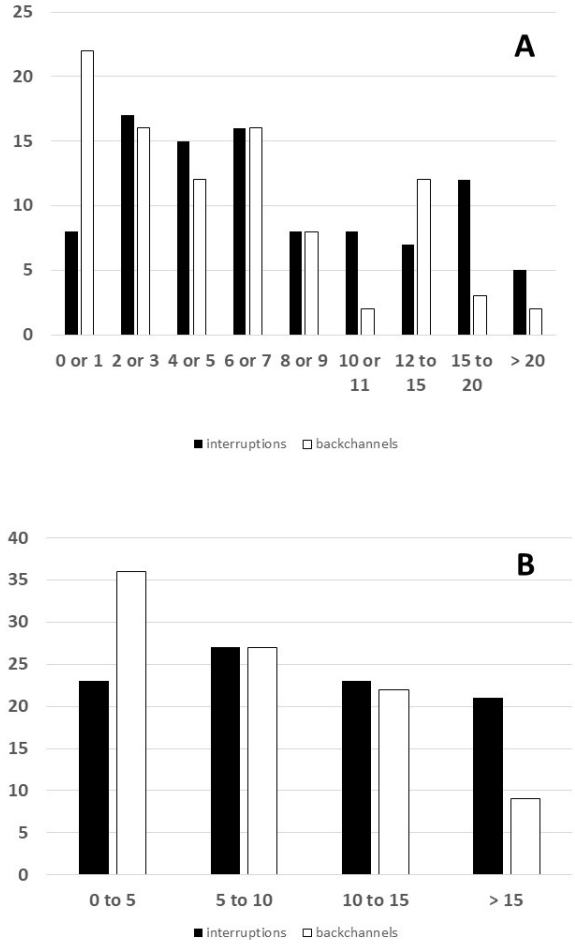


Figure 1. Classification of types of interruptions by consulting physicians during the patient's opening statement



Frequency plot of opening statement interruptions (panel A) and backchannels (panel B). Black bars represent the number of interruptions or backchannels per consultation, white bars represent the number of interruptions or backchannels per minute.

190x338mm (96 x 96 DPI)

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract (page 2)
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found (page 2)
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported (page 3)
Objectives	3	State specific objectives, including any prespecified hypotheses (page 3)
Methods		
Study design	4	Present key elements of study design early in the paper (page 4)
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection (page 4)
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants (page 4)
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable (page 4)
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group (page 4)
Bias	9	Describe any efforts to address potential sources of bias (page 4)
Study size	10	Explain how the study size was arrived at (page 4)
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why (page 4)
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding (page 4)
		(*b*) Describe any methods used to examine subgroups and interactions (not applicable)
		(*c*) Explain how missing data were addressed (not applicable)
		(*d*) If applicable, describe analytical methods taking account of sampling strategy (not applicable)
		(*e*) Describe any sensitivity analyses (not applicable)
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (page 6)
		(b) Give reasons for non-participation at each stage (page 6)
		(c) Consider use of a flow diagram (figure)
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (page 6)
		(b) Indicate number of participants with missing data for each variable of interest (page 6)
Outcome data	15*	Report numbers of outcome events or summary measures (page 6-7)
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were

		adjusted for and why they were included (page 6-7)
		(*b*) Report category boundaries when continuous variables were categorized (pasge 6-7)
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period (not applicable)
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses (page 7)
Discussion		
Key results	18	Summarise key results with reference to study objectives (page 8)
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias (page 8)
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence (page 8)
Generalisability	21	Discuss the generalisability (external validity) of the study results (page 8)
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based (page 9)

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.