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Review Article

The utility of Conversation Analysis versus Roter's Interaction Analysis System for studying communication in pharmacy settings: a scoping review

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Abstract

Objectives To compare the usefulness of the Roter Interaction Analysis System with Conversation Analysis (CA) for studying dynamic patient–pharmacist interactions within pharmacy practice. A scoping review was undertaken to identify all studies using Roter's method or CA to investigate patient–pharmacist interactions. The studies were then compared and contrasted for their methodological advantages and disadvantages.

Key findings In total, 31 studies met the inclusion criteria. Roter's method is effective in briefly describing patient–pharmacist interactions and can be used to measure the effect of training courses without consuming too much time. CA, although a time-consuming undertaking, looks at very specific features and the sequence of conversations including the dynamics of two-way interactions and can therefore be used to identify the source of conflict or misunderstandings. A flowchart showing the usefulness of both methods is suggested to help other researchers select the appropriate method(s) for their own research.

Summary Although both methods are effective for investigating patient–pharmacist interactions independently, using them sequentially could enable researchers to firstly identify how to make improvements (via CA), design relevant training and then investigate the impact of such training (via Roter's method) to enrich communications research.

Keywords: communication method; pharmacist-patient relationship; Conversation Analysis; Roter Interaction Analysis System; patient education

Introduction

Being a good communicator is crucial to the work of pharmacists and recognised as such by the World Health Organization.[1] Communication relates to numerous types of acts, including verbal, non-verbal, listening and written skills. A narrative review of barriers to patient-centred communication has already emphasised the importance of effective communication skills for building a robust relationship with the patient.[2] Going beyond this, numerous studies have also demonstrated that an effective pharmacist–patient relationship, in turn, has a positive impact on patient satisfaction, increasing patient education, improving patient adherence and outcomes, while decreasing medication-related problems as well as reducing medication waste and its associated costs.[3–6] Due to the importance of successful communication between pharmacists and patients for achieving desired outcomes, communication within this field has been the focus of attention for many researchers.

In fact, communication between patients and healthcare professionals or between healthcare professionals themselves has been examined within the medical field since the beginning of the 1960s.[7, 8] Despite decades of research and the many recommendations that have been suggested to improve healthcare communication, however, there are still no clear answers as to how exactly pharmacists can best interact with patients to promote adherence to their advice in everyday practice. Medication-related problems, medication waste and patient non-adherence are ongoing problems in healthcare, which could arguably be addressed if, as the literature shows, better communication is the key to improving patient outcomes.[9] Investigating interactions between patients and pharmacists thus continues to be relevant, with the development of pharmacists' communication skills considered to be an ongoing objective for educators. One of the ways to address the gap is to examine dynamic patient–pharmacist interactions using established methods to unearth the detail of what actually works best *in situ* and to devise relevant educational interventions accordingly.

Several methods have been used in previous research to examine communication *in situ* within the medical field.[5] Two established methods include Roter's Interaction Analysis System (RIAS)[10] and Conversation Analysis (CA).[11] In addition to being used to examine the dynamic nature of medical interactions, these have also been used in pharmacy settings. Both methods are useful for examining two-way interactions *in situ* because of their ability to explore real-time conversations, for example, the impact of participants' responses on each other. Other analytical methods, such as discourse analysis,[1] or thematic analysis,[2] while useful for interview research, are not helpful for analysing the dynamic nature of two-way interactions in the same way. This review therefore focusses on analysing the usefulness of the RIAS and CA methods for investigating real-time pharmacy interactions, to summarise what each method has to offer to help other researchers in selecting the right method for their own work. The review also summarises what findings these methods have unearthed in pharmacy. RIAS uses a quantitative coding system to describe the content of interactions by categorising verbal dialogue into different groups.[10] CA, on the other hand, is a qualitative method that uses transcription and interpretation to deeply understand the detail of an interaction.[11] An outline of each method is provided below.

The RIAS is a popular tool, developed from the social conversation theories of Debra L. Roter.[12] Data analysis by RIAS mainly relies on dividing each interaction into the smallest unit of expression, known as an utterance, and categorising these into the RIAS scheme. This scheme was originally developed from coding the content of patient–physician interactions (see Supplementary Appendix 1).[12] The RIAS tool involves two main categories; the socioemotional category, which relates to building a relationship with the patient and includes 14 subcategories, such as the expression of concern, approval or disapproval, agreement, criticism and empathy, and the task-oriented category, which is related to the performance of the medical function and includes about 29 subcategories, such as asking for or giving information.[10, 12] The RIAS method can code the other party's utterances (e.g. the patient's utterances or their carer's) in different ways.[12] For example, asking a question or giving information can be classified as being task-oriented content, while the expression of their (the patient's) concerns can be classified as socioemotional content. An updated version of RIAS also includes a description of the conversation structure, such as speaker turns,[3] dialogue interactivity,[4] turn density,[5] and turn duration.[6,13] The application of the RIAS method is limited to the medical field and focusses only on health professional–patient interactions.[12] RIAS studies have unearthed important findings relating to the type of verbal communication used during such interactions and have also proved useful for assessing the impact of training on health professionals' skills. For example, these studies can demonstrate improvements in terms of more patient-centred communication, important for encouraging patient adherence to medication.[14–16]

The CA method is also useful for examining and exploring human interaction in its natural setting.[17, 18] It focusses on identifying, in an interaction, what happened and how it happened.[11, 17] According to CA principles, conversation is made up of many turns and each turn is identified as a Turn Constructional Unit[7] (TCU). The main four ways of categorising or interpreting data through CA, described as 'analytically distinguished but interlocking organisations', are turning-taking organisation,[8] sequence organisation,[9] repair organisation,[10] and the organisation of turn design.[11] In the 1980s, researchers started using CA to examine medical practice, especially physician–patient interactions.[4, 19] This research on physician–patient interactions includes such work as that of Frankel[20] and West.[21] The studies expanded with time to include interactions among patients and other healthcare staff, such as nursing staff, midwives, health visitors, pharmacists and physiotherapists.[4, 17, 19] The findings of CA studies are used to enhance medical education relating to patient-centred approaches. CA has identified, for example, the persistence of professional-led conversations despite expectations around patient-centred care and patient involvement. For example, in patient–physician encounters in primary care, physicians continue to structure the dialogue by managing and ordering their turns at conversation.[17] Nonetheless, CA findings and recommendations are reported to have had a positive impact on developing many aspects of physician–patient interactions, for

1 Discourse analysis is the study of the ways in which language is used between people, both in written texts and spoken contexts.

2 Thematic content analysis is a form of qualitative analysis which involves recording or identifying passages of text or images that are linked by a common theme or idea.

3 Speaker turn is defined as a continuous segment of uninterrupted utterances of a single speaker. The total number of speaker turns per interview can be interpreted as the rate of floor exchanges.

4 Dialogue interactivity is defined as the number of speaking turns per interview minute. For example, a 5-min interview with 30 turns will average 6 turns per minute.

5 Turn density is characterised as the average number of utterances within a turn by the speaker.

6 Turn duration represents the length of time in seconds spanning the block of uninterrupted speech by the speaker.

7 The basic unit of social action. It can be a sentence, clause, phrase or single word.

8 Turn-taking organisation is defined as 'organisation of speaker change'.

9 Sequence organisation 'refers to the common experience that one thing can lead to another'.

10 Repair refers to organised ways to deal with troubles in the interaction process, such as problems of mishearing or understanding.

11 Turn design refers to 'a collected number of aspects of how participants construct, design, formulate their turns'.

instance, identification of the structure of component activity and interaction sequences.[22]

Because of the contrast between the RIAS and CA methods, however, the pros and cons of each method must be considered before choosing between the two. This review focuses on comparing these two distinct methods (CA, a qualitative method, with RIAS, a quantitative method), in terms of their usefulness within pharmacy practice to help other researchers in selecting appropriate method(s) for their own work.

Method

A comprehensive search of the published literature was conducted to identify and evaluate all the published studies using either the RIAS or CA method in a pharmacy setting.

Information sources and searches

The search was performed using seven databases: the Cochrane Library, PsycINFO, PubMed, ScienceDirect, Scopus, Summon and Web of Science from December 2019 to March 2020 (with a re-run of the search in January 2021). Search terms included the method of data analysis (the phrase 'Roter Interaction Analysis System', 'RIAS' or 'Conversation Analysis') and terms related to pharmacy practice (pharm*) to identify relevant articles. The search combinations included: 'Roter Interaction Analysis System' AND (Pharm*), OR 'RIAS' AND (Pharm*), OR 'Conversation Analysis' AND (Pharm*). The term (Pharm*) was used to ensure all medical terminologies related to pharmacy practice were included, such as 'pharmacist', 'pharmacies', 'pharmacy' or 'pharmaceutical'. Additionally, subsequent citations of included articles and their reference lists were both checked to identify other relevant studies that may have been missed via the databases searches. Searching journals for other relevant studies was not performed because of the use of the Summon database, which covers newspaper articles, standards, conference proceedings, government documents, trade publications and book reviews. The search was conducted by the first author (S.A.) and verified by the third (P.D.). Details of search strategies are outlined in Supplementary Appendix 2. All the research results from each database were imported into the Endnote software.

Inclusion and exclusion criteria

The inclusion criteria were: primary research articles or reports (e.g. theses) using the RIAS or CA methods, studies that related to pharmacist–patient interactions and English language publications. No publication date limits were set. Studies were excluded if the applied method of study was not RIAS or CA or did not focus on pharmacist–patient interactions or the pharmacy setting. Studies published in a language other than English were also excluded.

Study selection

The details of the search and retrieval strategy are outlined in Figure 1 as a PRISMA flow chart. At first, duplicates were removed by applying the 'remove duplicate' function on the Endnote software. The initial screening then involved scanning the Titles, Abstract and Keywords of the articles which was performed by the first author (S.A.) to find relevant papers and reports. In addition, the citation and reference lists of related records were screened for any missed work. Thesis papers were not excluded from this review. Both authors (S.A. and P.D.) applied the inclusion and exclusion criteria to this pool of potentially eligible articles to finalise the list of included studies. The final list of included articles was kept by creating a separate folder in Endnote. These papers were then downloaded electronically and printed for the purpose of the analysis, which was completed by hand using the pen and paper method in Microsoft Word.

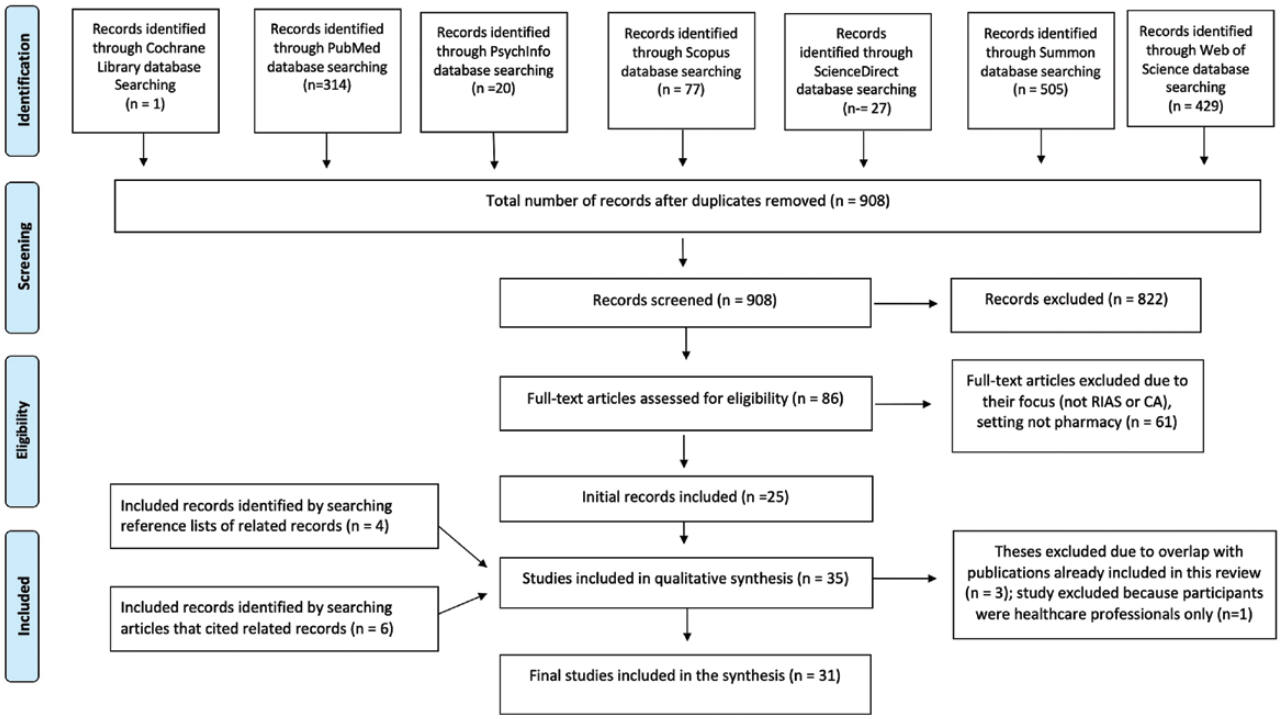

Figure 1 The literature search strategy and the identification of publications that had used either RIAS or CA included in this review.

Data analysis

The first author (S.A.) completed data analysis in consultation with the third author (P.D.) who provided guidance and supervision. The analytical process started with the creation of a summary of the central characteristics of the included studies to structure the literature review (see Supplementary Table 1). In addition, the content of included studies was analysed to summarise the aims, findings and suggested future work (see Supplementary Table 2). A main aim was to assess the usefulness of the studies and to summarise their key findings. To complete this, the method and results sections of each included study were analysed and coded. By first observing and labelling key concepts, it was then possible to identify the link between these codes to collect similar ideas under one theme. The codes were reviewed and analysed to identify similarities and differences between them. Therefore, the process of deriving the themes or constructs was an inductive approach using a similar process to thematic analysis. All comparison tables were created and kept by using Microsoft Word.

Reporting checklists of included studies

All included studies were critically considered by using reporting checklists. These checklists were used to check how well the authors reported the criteria of their studies and whether there were any missing details. The included studies used different types of methodology warranting the use of a range of checklist methods applicable to the study type. Although there are reporting checklists for mixed methods, these are not detailed enough to meet the criteria for the RIAS and CA methods. The Equator network was used to identify the most relevant checklist guidelines for each of the two methodologies. Since RIAS studies focus on exploring the relationship between protective factors (e.g. type and frequency of utterance or interaction duration) and outcomes (e.g. communication features, patient engagement or patient satisfaction), the STROBE: STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) criteria were used for the reporting of the RIAS studies.[23] On the other hand, as CA is a qualitative method, based on the Equator network's list, the standards for reporting qualitative research (SRQR) checklist was chosen for this type of study.[24] Two of the studies (see Supplementary Appendix 3) that used RIAS were randomised controlled trial (RCT) studies, therefore, the RCT-related reporting checklist (CONSORT) was used for assessing these.[25] The SRQR, STROBE and CONSORT criteria are provided in Supplementary Appendix 3. For illustrating compliance with the reporting guideline for qualitative systematic reviews, the reporting guideline: Enhancing transparency in reporting the synthesis of qualitative research (ENTREQ) has been used to illustrate the validity and reliability of this work (see Supplementary Appendix 4).[26]

Results

A total of 908 studies were identified as potentially relevant, which were screened after duplicates were removed. By scanning the Titles, Abstract and Keywords of these papers, a total of 86 studies were selected for full-text assessment, of which 25 were included in this review. Ten additional studies were identified for inclusion by screening the citation and reference lists of related records. Thus, a total of 35 studies were identified for further consideration. This included a total of five theses. Three of these theses, however, were published in more than one manuscript already included in the review, so they were excluded to avoid duplication, namely that of Pilnick,[27] Nguyen[28] and Watermeyer.[29] One more study was excluded because it focussed on the interaction between patients and other healthcare professionals (e.g. dentists, physicians, psychiatrists and nurses) rather than pharmacists. So, a total of 31 studies met the criteria for inclusion in this review and were thus selected for the final analysis.

The summary of the main characteristics of included studies, which had used either the RIAS tool (n = 14) or the CA method (n = 17), is outlined in Supplementary Table 1. The summary of the research topic (aim), main findings and future recommendations is presented in Supplementary Table 2. None of the included studies that had met the criteria were excluded after undergoing the reporting checklist assessment. All CA studies met the conditions for CA methodology, including recording data either by using audio or videotape, transcribing the data as a whole or part of it, submitting evidence of transcripts and using CA principles to analyse the data. However, three studies out of 17 did not mention the type of recording, that is, whether it was audio or video.[19, 30, 31] In addition, sampling strategies and level of participation were not mentioned in most of the CA studies. Failure to mention when data collection occurred (e.g. time of year, month) was noticeable in all CA studies except two, which stated the year in which data were collected.[30, 32] In terms of RIAS, in three studies out of 14 a single coder had coded the data, which may affect the reliability of the studies.[33–35] One study using the RIAS tool did not record the interactions between pharmacist and patient and relied on the researcher merely observing the interaction,[36] hence the reliability of this study may be reduced. Sampling strategies were not considered in four RIAS studies.[33, 34, 36, 37] Data collection time was mentioned in most RIAS studies.[33, 35, 38–43]

The similarities and differences between the two methods were identified in terms of their topic of focus, methodology, main findings and future recommendations. A comparison between RIAS and CA studies is thus outlined in Table 1. Finally, the usefulness of applying the two methods within pharmacy practice was summarised and categorised into five main themes: the description of the nature of communication, evaluation of pharmacist communication skills, the impact of communication style on various variables, sequence of actions and type of communication. Table 2 represents a summary of the usefulness of RIAS versus CA in pharmacy practice. Further details about these five themes are outlined in the subsequent sections.

The description of the nature of communication

Both methods succeeded in exploring the characteristic of pharmacist–patient communication. Studies using the RIAS method proved that the RIAS tool is useful for simply describing the pharmacist–patient communication. Most of the RIAS studies (n = 10) quantified communication between the pharmacist and patient or their carer (third party) in terms of the dominance of interview and type of utterance.[34–36, 38–42, 44] RIAS studies concluded that a patient-centred approach is not prevalent.[34–36, 38, 40, 41, 43, 44] Similarly, the CA studies succeeded in characterising the interactions. However, CA methods were able to deeply analyse the interactions to answer specific research questions. Five out of the 16 studies aimed to explore advice activity.[19, 31, 48–50] The Pilnick's[48] study demonstrated that the health professional dominance commonly observed in lay-physician encounters is not exhibited as much in pharmacist consultations. This is especially the case where pharmacists have known the patient for a long time, and where patients have a high level of knowledge about their condition. In addition, CA studies have observed that patient knowledge and experience about his/her medication result in a more flexible consultation. Salter[30] carried out an in-depth analysis of the interaction between a pharmacist and an older patient in a medication review consultation. She concluded that pharmacists could face several challenges during

Table 1 Comparison points between RIAS and CA methods

Comparison points		RIAS studies	CA studies
Focus topic		Give general brief description of characteristics of interactions Evaluate the impact of training courses on communication skills Evaluate relationships between specific variables and outcomes (e.g. patient satisfaction, patient loyalty)	Acknowledge that different participants have various objectives, deeply analyse interactions (e.g. how to assess patient understanding, how to deal with conflict, how pharmacists talk about death with AIDS patients, and what is the structure/template of the interaction)
Methodology	Data analysis	Quantitative analysis	Qualitative analysis (*what* happens and *how* it happened)
	Setting	Usually for the medical field. Limited to interactions between health providers and patients	Used for medical and other fields (e.g. educational and business). Not limited to patient interaction, but also includes interaction between healthcare professionals themselves
	Data transcription	Not necessary	Should be transcribed as part or whole. Usually Jeffersonian system is used
	Study design	Mainly used with statistical tests (e.g. linear regression, the Pearson correlation, Mann–Whitney *U* test, Wilcoxon rank test and *t*-test)	Used alone or accompanied by another method (e.g. discourse analysis, thematic content analysis or ethnography)
	Study sample	Large sample Range (10–196). Average about 75 interactions Cannot reanalyse the data	Small sample Range (1–45). Average about 32 interactions. Same data are reused for different purposes
	Type of data	Could be audio or videotape. Mainly audiotape in included studies (n = 9/14). (note: Sleath's[36] study used only observation without recording the interactions)	Could be audio or videotape. Mainly videotape in included studies (n = 12/17). All authors transcribed the data. Data can be reused and analysed in different ways within more than one research project/paper
	Stimulated patient	Recruited in 6/14 of the RIAS studies[34, 37, 40, 44–46]	Only recruited in one of the CA studies[47] that needed to recruit simulated patients to examine the learned interaction practice at classroom and workplace.
Findings and future work		Mostly general recommendations and suggestions to improve educational programmes (e.g. adherence topic needing to be considered)	The recommendations are specific and detailed (e.g. several strategies suggested to confirm the patient is understood, or how using jargon with patients with long-term conditions has a positive effect on pharmacist–patient relationships)
Others features		Easy to understand and apply by non-specialists	Need to learn the complex principles of CA and how to apply them

Table 2 Summary of the usefulness of RIAS and CA methods in pharmacy practice

Main themes	RIAS	CA
Description of the nature of communication	Allows simple description of main characteristics of interaction	Allows for deep analysis of the finer details of interaction
Evaluation of pharmacist communication skills	Allows for evaluation of the impact of training courses on communication skills before and after training course (speedy and efficient)	Allows the comparison of communication skills between different groups (e.g. between new pharmacist versus experienced pharmacist)
The impact of communication style on specific variables	Allows the evaluation of the relationship between specific variables and outcomes without being too time-consuming	Allows the evaluation of the relationship between specific variables and outcomes, but it is time-consuming and requires much effort
Sequence of turns	Does not consider sequence of turns. Instead, the utterance of one speaker is analysed separately from other participants	Considers sequence of turns meaning the true dynamics can be investigated (e.g. sequences of responses)
Type of communication	Mainly allows for investigation of verbal communication	Allows the investigation of both verbal and non-verbal communication

medication reviews, particularly with older patients, finding little evidence of two-way communication during these encounters, in which the pharmacist mainly led the conversation.

Evaluation of communication skills and development over time

Assessment of pharmacists' skills in communication with patients has also been addressed by researchers using the RIAS and CA methods. RIAS was used to examine the development of communication skills before and after a training session in two studies.[45, 46] These two studies proved the positive effect of these courses on improving communication skills. One study out of the 14 using RIAS evaluated pharmacy student skills during objective structured clinical examination (OSCE) performance.[37] Similarly, the CA method allows pharmacy practice to be examined for improvements over time. Three CA studies assessed the impact of repetition of the action (e.g. counselling) over time on the pharmacist's communication skills.[47, 50, 51] These studies demonstrated that the pharmacist's interactional competence changed and developed over time as a result of repeating the action (i.e. practice over time).

The impact of communication style on specific variables

The influence of communication style has been one of the major interests in RIAS and CA communication research. RIAS studies used statistical analytical tests to examine the relationship between the type of utterances made by pharmacists (e.g. emotional talk) or patients (e.g. negative talk), the frequency of utterance categories which reflect communication style, various variables (e.g. age, race and gender) and outcomes (e.g. patient satisfaction). For example, Sleath[36] examined the effect of participants' (patient and pharmacist) demographic characteristics on their communication style. It is stated that the participatory style is used more with an elderly patient than younger patients and is more frequent with repeated prescriptions. Another RIAS study examined the relationship between pharmacists' communication style and the prospect of the patient returning to the same pharmacy to obtain their medication.[33] Correspondingly, the effect of communication style on patient adherence was investigated in five CA studies.[19, 30, 32, 52, 53] These studies concluded that improving communication between the pharmacist and patient had a great effect on reducing patient resistance to the medical plan and led to a shift towards more patient-centred care.

Sequence of action

The sequence of interactional activity within pharmacy has only been examined by CA methodology. Three templates of pharmacist–patient encounters have been proposed by applying CA tools.[50, 54, 55] In addition, these templates have been compared with early work on CA, such as Zimmerman's and Jefferson's templates.[56, 57] Watermeyer and Penn[55] described the content and structure of the first and subsequent encounters between an HIV/AIDS pharmacist and the patient. An example of the first suggested template by Pilnick[54] proposed the structure of patient–pharmacist interaction as follows:

Opening/Identification/Recognition/Acknowledgement
Greeting
Approach to advice giving
Arrival at advice giving
Acceptance/Rejection of Intention
(Rearrival)

Delivery of advice/information
Response to advice/information
Close implicature (Questions/Reclose implicature)
Exit.

CA studies have also succeeded in assessing the second party's (e.g. patient's) response to one action. Several strategies used by pharmacists to verify the patient's understanding of their counselling were identified including specific questions, using response solicitations and monitoring patients' verbal and non-verbal responses.[52, 53, 58–60] None of the RIAS studies had examined the patient response to pharmacist action or proposed a structural template of pharmacist–patient interaction. The RIAS analytical system permits researchers to examine patient utterances in a similar but independent way to pharmacist utterances.

Type of communication

One of the major differences between RIAS and CA protocols is related to the type of communication used in data analysis. Analysis of data by the RIAS tools is mainly focussed on verbal actions, although some of the non-verbal actions were coded in two studies, by the coder using a rating scale from one to six immediately after the interview.[45, 46] Verbal transcription of tape was not applied to all RIAS studies included, only 7 studies out of 14 used transcribed data.[33, 36, 39, 41, 43, 45, 46] Some studies (n = 5) did not transcribe the data to hard copy. However, the data analysis by CA studies coded verbal and non-verbal communication. All verbal data of CA studies were transcribed according to the Gail Jefferson transcription system as a whole or part.[57] Non-verbal actions were written between brackets in the transcribed sheets. All CA studies had some examples of transcribed data. Figure 2 shows an example of CA transcribed sheets.[53]

Because of the numerous important differences in the usefulness of RIAS and CA methods, a flowchart showing the relative utility of RIAS and CA was created and is presented in Figure 3. The type of participant, the intention of the study, sample size, time, consideration of action sequences, the type of communication being assessed, and consideration of the finer details, are all factors considered in the flowchart.

Discussion

This is the first comprehensive literature review to examine the relative value of applying RIAS and CA methods in studying pharmacist–patient interactions. The differences between RIAS and CA in terms of their analytical elements mean these tools are relevant for different purposes in pharmacy settings. The RIAS method has proved to be effective in briefly describing pharmacist–patient interactions and it can be used to measure the effect of training courses (e.g. assessing the difference in communication skills before and after the training course) without being too time-consuming, whereas CA is more suitable than RIAS for intensely exploring pharmacist–patient interactions in detail. This study had several strengths. First, this review is the first comparison between RIAS and CA methods in pharmacy practice, hence a range of RIAS and CA studies have been brought into one reference that is easier for other researchers to use to guide their own work. Also, the findings from included studies have not only been reviewed and summarised but have also been pooled to capture how we might improve communication in pharmacy. Based on these findings, a flowchart of the utility of the RIAS versus the CA method was suggested that can be used to facilitate the proper application of these methods in future communication research within pharmacy and the wider medical field (Figure 3). Another strength is that this study has met all but one of the ENTREQ criteria,[26] which is recognised by the Equator network to identify the validity and reliability of systematic reviews. Another strength of this study is that all the selected studies went through an appraisal process based on an assessment criterion appropriate to each method. This step is essential to reasonably weigh all included studies and exclude those that have a heavy bias or weak results. However, one limitation of this study is that the included studies were carried out across different nations that might have differences in societal norms around communication, for example, between different cultures and societal contexts. The impact of this on communication needs to be considered in future research.

The RIAS analysis system has many advantages. The RIAS method saves time because it is simpler to learn and apply, thus making it easier to collect and analyse data by novice researchers (e.g. doctoral students) than if they were to use the CA method, which usually requires extensive training.[12] It is also easier to apply the method because RIAS does not require data to be transcribed as hard copy, as the data can be directly coded from the recording device. This feature makes it easy for researchers to use the method to assess the impact of training courses on the pharmacist's interactional style, for example, in a relatively short time.[12] In contrast, the CA method is time-consuming as it requires the whole data, or parts of it, to be transcribed in detail. Data within all the CA studies identified (n = 17) were transcribed into conversational transcripts as hard copy. Although the transcription process takes longer, these hard copies are easier than tape recordings to re-access and working from hard copies also facilitates both analysis and observation.[61, 62] For example, the CA data of Pilnick,[27] Nguyen[28] and Watermeyer[29] theses were reanalysed with diverse CA techniques to answer more than one research question and have been published in more than one paper.

In addition to being easier to learn and less time-consuming to apply, another advantage of the RIAS analysis system as a quantitative approach is that it allows researchers to study larger sets of data and apply inferential statistics to examine cause–effect. The RIAS studies included in this review analysed a larger sample of data (ranging from 10 to 196 interactions, with an average of about 75 interactions) whereas the CA qualitative studies had a smaller sample (ranging from 1 to 45 interactions, with an average of about 32 interactions). This is consistent with the general convention of qualitative studies using a smaller sample size than quantitative studies.[63] Thus, the RIAS tool allows researchers to assess the relationship between specific variables (e.g. the type of utterance or communication style) and outcomes (e.g. patient satisfaction or patient loyalty). For example, one study used the RIAS method to examine the relationship between the frequency of open versus closed questions and patient engagement.[35] This study demonstrated that patient engagement can be achieved by asking more open-ended questions. This is a similar observation to Pires and Cavaco,[16] who found that the RIAS makes it easier to establish a connection between the professional's verbal content and the patient's outcomes, such as patient satisfaction or adherence to the medication plan.

Despite these advantages, the RIAS scheme used in patient–pharmacist interactional studies included in this review had some limitations. The purpose of applying the RIAS scheme is to explore the main features of an interaction, such as interaction dominance or type of utterance. These features are limited to what is already included in the existing RIAS template, which includes the general characteristics of any medical interaction with patients regardless

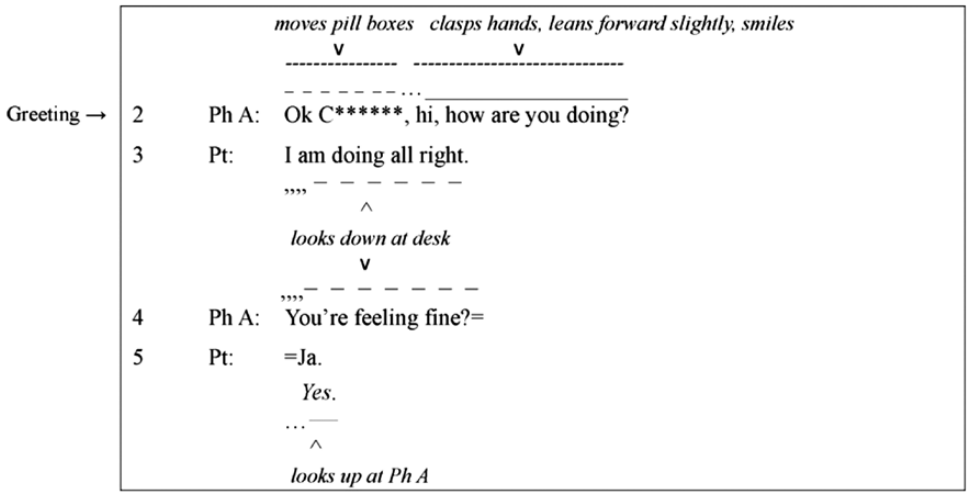

Figure 2 Example of CA transcribed sheet that captured the verbal and non-verbal action adopted from Watermeyer and Penn [55].

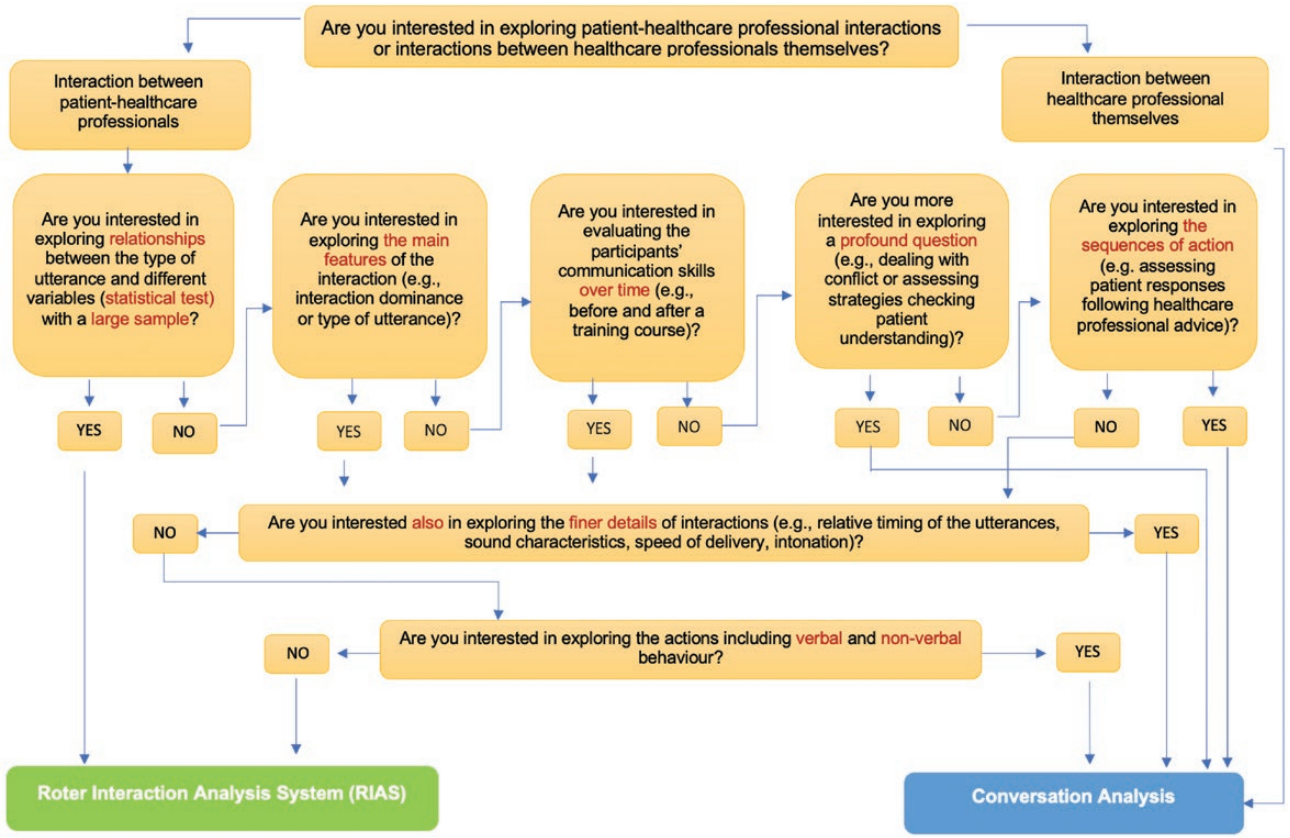

Figure 3 The flowchart of the utility of RIAS versus CA.

of the different agenda of each interaction type (patient–physician or patient–nurse versus patient–pharmacist) and the different settings. Indeed, the RIAS research studies included in this review used the pre-existing templates developed from patient–physician interactional studies to meet their aims but did not create templates specific to patient–pharmacist interactions. This is even though the RIAS template has some flexibility for adding subcategories within the basic scheme to fit any conversation.[12] This means that the exclusive features of patient–pharmacist interaction were not assessed because the researchers mainly adapted templates from patient–physician interactions.

Furthermore, the RIAS system of investigation relies on dividing the interaction into small utterances and completing the predefined template. This limits the analysis of the interaction to a specific focus and misses a number of other essential details, such as the relative timing of the utterances, sound characteristics, speed of delivery, intonation and non-verbal behaviour.[64] Accordingly, most RIAS study findings included in this review, while stating that a communication

skills programme needs to be set up to improve pharmacist communication skills, did not explain what this should cover and how it could be achieved. This is a downside of the RIAS analysis system which does not consider the finer details of interactions or the sequences of actions. In fact, the shifting of social speaking between participants is not considered to be a part of the RIAS system of analysis at all, whereas arguably a good understanding of any interaction requires the sequence of the actions to be studied. To explain, while the RIAS system allows researchers to code for the other party's (e.g. patient's or career's) responses, in addition to the health professional being studied, this is done separately.[12] Thus the actions and utterances of one participant (the pharmacist) are analysed independently from the actions of the other participant (the patient), which fails to capture the sequence of actions and the connection between the participant responses. This results in an incomplete view as to what is happening during the interaction. In contrast, studying the sequential actions (which CA enables) provides an opportunity to assess the second party's responses (patient responses), and hence identify what is preferred and what is dis-preferred within the pharmacist–patient interaction (i.e. be able to judge the effectiveness of the interaction with fine granularity and provide recommendations for change). Additionally, the RIAS analysis system mainly analyses and codes verbal communication, and any analysis of non-verbal communication is limited to the tone of voice. This again hinders assessment of non-verbal responses (e.g. nods, shakes of the head), which are also important for revealing responses that are not necessarily said or disclosed in words.

In comparison, the application of CA methods in pharmacy practice is effective in providing in-depth analysis of interactional details. This is to be expected because the principles of CA allow exploration of all turns within an interaction and analysis of them in a dependent manner. CA helps to inform the researcher about what has happened (the action) and how it has happened.[11] For example, Nguyen[65] used CA techniques to understand how conflict emerges and how it is resolved during an interaction. CA processes also facilitate the researcher to identify and analyse in-depth the sequencing of actions, the pattern of this sequencing and repairing talk problems.[3, 9] Taking in the sequence of actions has enabled researchers to propose templates of pharmacist–patient interactions.[50, 54, 55] In addition, CA analysis facilitates the assessment of patient responses within the interaction. For example, Watermeyer[32] used the CA methods to assess how patient adherence may be affected by the way the pharmacist talks about death with an AIDS patient.

Another advantage of CA is its ability to consider all the finer details of an interaction in the analysis, such as silences, speed of speech, intonation and voice tone, which results in fully understanding the pharmacist and patient behaviours. In addition, CA analysis is interested in examining non-verbal communication as well as verbal communication. Therefore, audio recorders were only used in early CA studies (before 2003), and all recent CA studies (after 2003) use a video recorder. Because of these advantages of CA analysis, it has been possible for these studies to suggest new strategies to improve communication and build good pharmacist–patient rapport. For example, Watermeyer and Penn[53] applied CA to identify how pharmacists can assess a patient's understanding and the implications of these strategies in pharmacy practice.

Although both methods (RIAS and CA) are effective for investigating the interactions within pharmacy practice separately, there are potential advantages to combining these methods to enrich investigations of communication within the medical field. For communication to be improved, it is important to identify what is happening (e.g. conflict or misunderstanding or miscommunication), how it has happened (e.g. how conflict emerged or reasons of miscommunication), and how it is resolved (e.g. participants' responses to each other). This is exactly the type of information that can be yielded through CA studies, enabling researchers to propose new strategies, approaches and educational training sessions for improving communication through inductive theory building. By combining RIAS methods, the application of these new strategies and any training for better communication can then be assessed statistically using the RIAS system. Here, the RIAS system would then enable researchers to examine specific actions during communication to test a new suggested hypothesis, or to assess the type and frequency of any variable that related to that interaction, for example, the frequency of open-ended versus closed questions.

Conclusion

Both methods, RIAS and CA, proved to be effective in investigating communication within pharmacy practice, but for different purposes. The RIAS method is a more suitable method for use in studies interested in briefly describing pharmacist–patient interactions or measuring the effect of training courses in a relatively short period of time, whereas CA is more suitable for use in studies interested in exploring the finer details of pharmacist–patient interactions. All included studies in this review have demonstrated that patient-centred care has not yet been fully achieved within the pharmacy setting. Therefore, a continued examination of communication within pharmacy is required for improving pharmacists' communication skills and striving for better patient outcomes. The suggested flowchart of the utility of RIAS versus CA method can be used to aid other researchers in suitably selecting between these two methods in future communication research. Sequentially applying both methods in future research has considerable potential for improving communication within pharmacy practice and within the wider medical field.

Supplementary Material

Supplementary data are available at *International Journal of Pharmacy Practice* online.

Author Contributions

We confirm that all authors contributed meaningfully to this publication. S.A. and P.D. were responsible for conceptualisation. S.A. completed the search and retrieval process and D.G. and P.D. were involved in the analytic process with S.A. All authors contributed meaningfully to the development of the manuscript and its editing.

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Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

References

1. Thamby SA, Subramani P. Seven-star pharmacist concept of WHO. *J Young Pharm* 2014; 6: 1–3. https://doi.org/10.5530/jyp.2014.2.1

2. Ilardo ML, Speciale A. The community pharmacist: perceived barriers and patient-centered care communication. *Int J Environ Res Public Health* 2020; 17: 536. https://doi.org/10.3390/ijerph17020536
3. Stevenson FA, Cox K, Britten N *et al*. A systematic review of the research on communication between patients and health care professionals about medicines: the consequences for concordance. *Health Expect* 2004; 7: 235–45. http://doi.org/10.1111/j.1369-7625.2004.00281.x
4. Maynard DW, Heritage J. Conversation analysis, doctor-patient interaction and medical communication. *Med Educ* 2005; 39: 428–35. http://doi.org/10.1111/j.1365-2929.2005.02111.x
5. Shah B, Chewning B. Conceptualizing and measuring pharmacist-patient communication: a review of published studies. *Res Social Adm Pharm* 2006; 2: 153–85. http://doi.org/10.1016/j.sapharm.2006.05.001
6. World Health Organisation. *Adherence to Long-Term Therapies: Evidence for Action* 2003. Geneva https://www.who.int/chp/knowledge/publications/adherence_report/en/ (1 December 2020, date last accessed).
7. Chamberlayne EP, Gross AR. *A study of the nature of the interaction between non-medical personnel and psychiatric patients*. Ph.D. Thesis, Boston, MA: Boston University, 1961.
8. Rosen G. Some substantive limiting conditions in communication between health officers and medical practitioners. *Am J Public Health Nations Health* 1961; 51: 1805–16. http://doi.org/10.2105/ajph.51.12.1805
9. Gysels M, Richardson A, Higginson IJ. Communication training for health professionals who care for patients with cancer: a systematic review of effectiveness. *Support Care Cancer* 2004; 12: 692–700. http://doi.org/10.1007/s00520-004-0666-6
10. Cavaco A, Roter D. Pharmaceutical consultations in community pharmacies: utility of the Roter Interaction Analysis System to study pharmacist-patient communication. *Int J Pharm Pract* 2010; 18: 141–8. https://doi.org/10.1211/ijpp/18.03.0003
11. Have P. *Doing Conversation Analysis*. Los Angeles, CA: Sage, 2007.
12. Roter D, Larson S. The Roter interaction analysis system (RIAS): utility and flexibility for analysis of medical interactions. *Patient Educ Couns* 2002; 46: 243–51. http://doi.org/10.1016/s0738-3991(02)00012-5
13. Roter DL, Larson SM, Beach MC *et al*. Interactive and evaluative correlates of dialogue sequence: a simulation study applying the RIAS to turn taking structures. *Patient Educ Couns* 2008; 71: 26–33. http://doi.org/10.1016/j.pec.2007.10.019
14. Beach MC, Roter DL, Saha S *et al*. Impact of a brief patient and provider intervention to improve the quality of communication about medication adherence among HIV patients. *Patient Educ Couns* 2015; 98: 1078–83. http://doi.org/10.1016/j.pec.2015.05.011
15. Wissow L, Gadomski A, Roter D *et al*. Aspects of mental health communication skills training that predict parent and child outcomes in pediatric primary care. *Patient Educ Couns* 2011; 82: 226–32. http://doi.org/10.1016/j.pec.2010.03.019
16. Pires CM, Cavaco AM. Communication between health professionals and patients: review of studies using the RIAS (Roter Interaction Analysis System) method. *Rev Assoc Med Bras (1992)* 2014; 60: 156–72. http://doi.org/10.1590/1806-9282.60.02.014
17. Drew P, Chatwin J, Collins S. Conversation analysis: a method for research into interactions between patients and health-care professionals. *Health Expect* 2001; 4: 58–70. http://doi.org/10.1046/j.1369-6513.2001.00125.x
18. Kasper G, Wagner J. Conversation analysis in applied linguistics. *Annu Rev Appl Ling* 2014; 34: 171–212. https://doi.org/10.1017/S0267190514000014
19. Pilnick A. "Patient counseling" by pharmacists: advice, information, or instruction? *Sociol Q* 1999; 40: 613–22. https://doi.org/10.1016/S0277-9536(02)00082-5
20. Frankel R. From sentence to sequence: understanding the medical encounter through microinteractional analysis. *Discourse Process* 1984; 7: 135–70. https://doi.org/10.1080/01638538409544587
21. West C. *Routine Complications: Troubles with Talk between Doctors and Patients*. Bloomington: Indiana University Press, 1984.
22. Heritage J, Maynard D. Problems and prospects in the study of physician-patient interaction: 30 years of research. *Annu Rev Sociol* 2006; 32: 351–74. https://doi.org/10.1146/annurev.soc.32.082905.093959
23. Erik V, Altman DG, Egger M *et al*. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Ann Intern Med* 2007; 147: 573–7. https://doi.org/10.7326/0003-4819-147-8-200710160-00010
24. O'Brien BC, Harris IB, Beckman TJ *et al*. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med* 2014; 89: 1245–51. http://doi.org/10.1097/ACM.0000000000000388
25. Schulz KF, Altman DG, Moher D; CONSORT Group. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. *Trials* 2010; 11: 32. http://doi.org/10.1186/1745-6215-11-32
26. Tong A, Flemming K, McInnes E *et al*. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Med Res Methodol* 2012; 12: 181. http://doi.org/10.1186/1471-2288-12-181
27. Pilnick A. *"Pharmacy counselling": a study of the pharmacist/patient encounter using conversation analysis*. Ph.D. Thesis, Nottingham, UK: University of Nottingham, 1997.
28. Nguyen H. *The development of communication skills in the practice of patient consultation among pharmacy students*. Ph.D. Thesis, Madison, WI: University of Wisconsin-Madison, 2003.
29. Watermeyer J. *Pills of wisdom: an investigation of pharmacist-patient interactions in a South African antiretroviral clinic*. Ph.D. Thesis, Johannesburg, South Africa: University of the Witwatersrand, 2008.
30. Salter C. Compliance and concordance during domiciliary medication review involving pharmacists and older people. *Sociol Health Illn* 2010; 32: 21–36. http://doi.org/10.1111/j.1467-9566.2009.01193.x
31. Pilnick A. "Patient counselling" by pharmacists: four approaches to the delivery of counselling sequences and their interactional reception. *Soc Sci Med* 2003; 56: 835–49. http://doi.org/10.1016/s0277-9536(02)00082-5
32. Watermeyer J. "Now here come the pills that are going to save your life": pharmacists' discussions of antiretroviral drugs in a context of life and death. *AIDS Care* 2011; 23: 807–13. http://doi.org/10.1080/09540121.2010.534640
33. Antunes L, Gomes JJ, Cavaco AM *et al*. How pharmacist–patient communication determines pharmacy loyalty? Modeling relevant factors. *Res Social Adm Pharm* 2015; 11: 560–70. https://doi.org/10.1016/j.sapharm.2014.11.003
34. Veiga P, Lapão LV, Cavaco AM *et al*. Quality supply of nonprescription medicines in Portuguese community pharmacy: an exploratory case study. *Res Social Adm Pharm* 2015; 11: 880–90. http://doi.org/10.1016/j.sapharm.2014.12.009
35. Cavaco AM, Romano J. Exploring pharmacists' communication with customers through screening services. *Patient Educ Couns* 2010; 80: 377–83. http://doi.org/10.1016/j.pec.2010.06.028
36. Sleath B. Pharmacist-patient relationships: authoritarian, participatory, or default? *Patient Educ Couns* 1996; 28: 253–63. http://doi.org/10.1016/0738-3991(95)00845-4
37. Kubota Y, Yano Y, Seki S *et al*. Assessment of pharmacy students' communication competence using the Roter Interaction Analysis System during objective structured clinical examinations. *Am J Pharm Educ* 2011; 75: 43. http://doi.org/10.5688/ajpe75343
38. Pelicano-Romano J, Neves MR, Amado A *et al*. Do community pharmacists actively engage elderly patients in the dialogue? Results from pharmaceutical care consultations. *Health Expect* 2015; 18: 1721–34. http://doi.org/10.1111/hex.12165
39. Al-Nagar A. *An exploration of consultation skills in community pharmacists*. Ph.D. Thesis, Norwich, UK: University of East Anglia, 2014.
40. Chong WW, Aslani P, Chen TF. Pharmacist-patient communication on use of antidepressants: a simulated patient study in community pharmacy. *Res Social Adm Pharm* 2014; 10: 419–37. http://doi.org/10.1016/j.sapharm.2013.05.006
41. Mulyono I, Irawati S, Susilo AP *et al*. Pharmacist-patient communication in Indonesia: the Roter Interaction Analysis System (RIAS) in a socio-hierarchical context. *Pharm Educ* 2019; 19: 359–69.
42. Rivas C, Sohanpal R, MacNeill V *et al*. Determining counselling communication strategies associated with successful quits in the National Health Service community pharmacy Stop Smoking programme in East London:

a focused ethnography using recorded consultations. *BMJ Open* 2017; 7: e015664. http://doi.org/10.1136/bmjopen-2016-015664
43. Driesenaar JA, De Smet PA, van Hulten R *et al*. Communication during counseling sessions about inhaled corticosteroids at the community pharmacy. *Patient Prefer Adherence* 2016; 10: 2239–54. http://doi.org/10.2147/PPA.S108006
44. Nakayama C, Kimata S, Oshima T *et al*. Analysis of pharmacist-patient communication using the Roter Method of Interaction Process Analysis System. *Res Social Adm Pharm* 2016; 12: 319–26. http://doi.org/10.1016/j.sapharm.2015.05.007
45. Pilnick A. 'Why didn't you say just that?' Dealing with issues of asymmetry, knowledge and competence in the pharmacist/client encounter. *Sociol Health Illn* 1998; 20: 29–51. https://doi.org/10.1111/1467-9566.00079
46. Dyck A, Deschamps M, Taylor J. Pharmacists' discussions of medication side effects: a descriptive study. *Patient Educ Couns* 2005; 56: 21–7. http://doi.org/10.1016/j.pec.2003.10.006
47. Nguyen H. Sequence organization as local and longitudinal achievement. *Text Talk* 2008; 28: 501–28. https://doi.org/10.1515/TEXT.2008.025
48. Liekens S, Vandael E, Roter D *et al*. Impact of training on pharmacists' counseling of patients starting antidepressant therapy. *Patient Educ Couns* 2014; 94: 110–5. http://doi.org/10.1016/j.pec.2013.09.023
49. Hanya M, Kanno Y, Akasaki J *et al*. Effects of communication skill training (CST) based on SPIKES for insurance-covered pharmacy pharmacists to interact with simulated cancer patients. *J Pharm Health Care Sci* 2017; 3: 11. http://doi.org/10.1186/s40780-017-0080-0
50. Nguyen HT. Constructing 'expertness': a novice pharmacist's development of interactional competence in patient consultations. *Commun Med* 2006; 3: 147–60. http://doi.org/10.1515/CAM.2006.017
51. Nguyen H. Interactional practices across settings: from classroom role-plays to workplace patient consultations. *Appl Linguist* 2018; 39: 213–35. https://doi.org/10.1093/applin/amw007
52. Watermeyer J, Penn C. Communicating dosage instructions across cultural and linguistic barriers: pharmacist-patient interactions in a South African antiretroviral clinic. *Stellenbosch Pap Linguist Plus* 2009; 39: 107–25. https://hdl.handle.net/10520/EJC142218
53. Watermeyer J, Penn C. "Tell me so I know you understand": pharmacists' verification of patients' comprehension of antiretroviral dosage instructions in a cross-cultural context. *Patient Educ Couns* 2009; 75: 205–13. http://doi.org/10.1016/j.pec.2008.09.009
54. Pilnick A. The interactional organization of pharmacist consultations in a hospital setting: a putative structure. *J Pragmat* 2001; 33: 1927–45. https://doi.org/10.1016/S0378-2166(00)00079-5
55. Watermeyer J, Penn C. The organization of pharmacist–patient interactions in an HIV/Aids clinic. *J Pragmat* 2009; 41: 2053–71. https://doi.org/10.1016/j.pragma.2009.02.010
56. Zimmerman D. The interactional organization of calls for emergency assistance. In: Drew P, Heritage J (eds.), *Talk at Work Interaction in Institutional Settings*. Cambridge, UK: Cambridge University Press, 1992, 418–69.
57. Jefferson G. Glossary of transcript symbols with an introduction. In: Lerner G (ed.), *Conversation Analysis Studies from the First Generation*. Santa Barbara, CA: John Benjamins, 2004, 13–34.
58. Watermeyer J. "She will hear me": how a flexible interpreting style enables patients to manage the inclusion of interpreters in mediated pharmacy interactions. *Health Commun* 2011; 26: 71–81. http://doi.org/10.1080/10410236.2011.527623
59. Felix T. *"You understand this one?" "You're very clear on this one?" Pharmacist's use of rephrasals to communicate across cultural and language barriers in a South African antiretroviral clinic*. Ph.D. Thesis, Netherlands: Utrecht, 2012.
60. Nguyen HT. The prime questions in authentic patient's consultations: a call for additional research on current and new paradigms. *Res Social Adm Pharm* 2013; 9: 339–52. http://doi.org/10.1016/j.sapharm.2012.04.007
61. Pilnick A, Hindmarsh J, Gill VT. Beyond 'doctor and patient': developments in the study of healthcare interactions. *Sociol Health Illn* 2009; 31: 787–802. http://doi.org/10.1111/j.1467-9566.2009.01194.x
62. Tsai MH, Lu FH, Frankel RM. Learning to listen: effects of using conversational transcripts to help medical students improve their use of open questions in soliciting patient problems. *Patient Educ Couns* 2013; 93: 48–55. http://doi.org/10.1016/j.pec.2013.03.022
63. DeCoster J, Lichtenstein B. Integrating quantitative and qualitative methods in communication research. *Commun Methods Meas* 2007; 1: 227–42. https://doi.org/10.1080/19312450701636599
64. Sandvik M, Eide H, Lind M *et al*. Analyzing medical dialogues: strength and weakness of Roter's interaction analysis system (RIAS). *Patient Educ Couns* 2002; 46: 235–41. http://doi.org/10.1016/s0738-3991(02)00014-9
65. Nguyen H. Boundary and alignment in multiparty conflict talk. *J Pragmat* 2011; 43: 1755–71. https://doi.org/10.1016/j.pragma.2010.11.003