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How do doctors address heart failure patients' disclosures of medication adherence problems during hospital and primary care consultations? An exploratory interaction-based observational cohort study

Christine Frigaard ,[1,2] Julia Menichetti,[2] Henrik Schirmer ,[1,3] Torbjørn Wisløff,[1,2] Herman Bjørnstad,[1,2] Tone Helene Breines Simonsen,[2] Pål Gulbrandsen ,[1,2] Jennifer Gerwing[2]

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For numbered affiliations see end of article.

Correspondence to
Dr Christine Frigaard;
christine.frigaard@medisin.uio.no

ABSTRACT

Objectives To investigate how doctors and self-managing older patients with heart failure (HF) discuss the patients' potential or ongoing medication adherence problems, and how such discussions evolve as patients transition from hospital to home, with particular focus on: (1) doctors' communicative actions aimed at addressing patient disclosures of adherence problems and (2) patients' feedback indicating whether their doctor's supportive actions were acceptable to them.

Design Exploratory interaction-based observational cohort study. Inductive microanalysis of authentic patient–doctor consultations, audio recorded for each patient at: (1) first ward visit in hospital, (2) discharge visit from hospital and (3) follow-up visit with general practitioner (GP).

Setting Hospital and primary care, Norway (2022–2023).

Participants 25 patients with HF (+65 years) and their attending doctors (23 hospital doctors, 25 GPs).

Results Analysis of 74 consultations revealed that 25 HF patients disclosed 23 practical adherence problems indicating risks of unintentional non-adherence (eg, limited resources to manage medications) and 39 perceptual problems indicating risks of intentional non-adherence (eg, worries, negative experience or stance). Doctors addressed 79% of patients' disclosures by: (1) exploring the scope of the problem or (2) providing supportive actions to improve patients' ability or motivation to adhere. We calculated nearly five times higher odds for doctors to address patients' practical problems to their perceptual problems (OR 4.79, 95% CI 1.25 to 25.83). Unresolved problems included: (1) doctors addressed patients' disclosures, but patients signalled the supportive actions were unsuitable (37%) and (2) doctors left disclosures unaddressed (21%).

Conclusions In this explorative study, the doctors were more likely to address the patients' adherence problems associated with unintentional non-adherence risks than those associated with intentional non-adherence risks. Even when doctors attempted to address HF patients' medication adherence problems, half of the problems remained unresolved, usually because patients indicated that the doctor's suggestion to improve their situation was against their preference.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ A detailed and comprehensive description of how often and how doctors respond to heart failure patients' disclosures indicating risks of medication non-adherence and, in turn, how patients respond to doctors' supportive actions.
⇒ Analysis of authentic medical consultations at three key time points for each patient as they transition from hospital to home.
⇒ Participant reactivity to the study situation may have led to more talk about medications and 'best practice behaviour'.
⇒ Limited generalisability to other settings and patient groups.

INTRODUCTION

Heart failure (HF) is a chronic, life-threatening condition prevalent among older people.[1 2] The global burden is high (estimated to affect 64 million people in 2023) and growing, due to an ageing population.[1] The cornerstone of HF management to alleviate symptoms, reduce hospital admissions and improve life expectancy is pharmacotherapy, using a combination of four to five medications.[3–5] Older patients with HF often have comorbidities, leading to complex regimens with more than ten medications.[6 7] In this patient group, medication adherence is alarmingly low,[8 9] thereby limiting therapeutic benefits.[10] Patients with HF fail to take their medications as prescribed for several reasons, including not understanding the prognosis

and the purpose of their prescriptions, complex medication schedules and experience of adverse effects.[11–15] Medication non-adherence can be intentional or unintentional[16 17], which emphasises the need for doctors to assess patients' ability and motivation to take their medications as prescribed.[18] Therefore, guidelines recommend that clinicians talk to patients about their medication use to ensure that any treatment decisions are based on current intake of medications.[19 20]

Although good communication between patients and doctors improves medication adherence[21 22], little is known about how patients with HF and their doctors talk about adherence in medical consultations. Indeed, most studies analysing interactions have focused on other patient groups in outpatient settings.[23–29] More knowledge is needed about how doctors and patients with HF talk about adherence problems, and how doctors address such problems. Building such knowledge begins with defining these phenomena, identifying and analysing them as they occur in authentic consultations, and deriving implications for enhancing future practice. Due to frequent hospital readmissions in this patient group, longitudinal studies can inform how conversations about adherence problems evolve over time and experience and as patients are cared for by different doctors in hospital and primary care. Ideally, acquired knowledge can inform content and examples for communication skills training aimed at improving patient adherence.

In a previous study, we analysed 74 real-life consultations between 25 self-managing older patients with HF and 48 doctors and found that the patients often disclosed information to their doctors that signalled potential or ongoing medication adherence problems at home.[30] The present study built on these identified problem disclosures and aimed to investigate the discussions that emerged from them. Data were the same authentic audio recorded consultations and medical records collected at three time points as patients transitioned from hospital to home. We recognised, defined and counted our phenomena of interest: (1) doctors' communicative actions aimed at addressing patient disclosures of adherence problems and (2) patients' feedback to the doctors indicating whether their supportive actions were acceptable to them.

METHODS

Overview of study design, participants and data collection

This is an exploratory interaction-based observational cohort study. We followed 25 older patients with HF from their admission to the hospital to their return home and their first follow-up visit with their general practitioner (GP).

Recruitment of study participants (patients, hospital doctors and GPs) and data collection took place from February 2022 to February 2023. We recruited patients to this study who were admitted from home to the heart ward at Akershus University Hospital in Norway and fulfilled our inclusion criteria; they were diagnosed with HF, 65 years or older, managing their own medications, and living in the catchment area of the hospital. We excluded patients who required an interpreter or had a temporarily reduced ability to consent according to the ward nurse. Doctors in this study were either hospital doctors or GPs who attended to patients during the consultations selected for observation. See table 1 for participant characteristics.

We identified and invited eligible patients to participate following these three steps: (1) the project assistant (THBS) screened admission records from the heart ward every morning, Monday to Friday, (2) two researchers (CF and HB) verified inclusion criteria and exclusion criteria with the ward nurse and (3) recruited the attending hospital doctor. We informed all doctors about the study prior to recruiting patients. We observed and audio recorded the following three patient–doctor consultations: (1) first heart ward visit in hospital, (2) discharge visit from hospital and (3) first follow-up visit with GP. Table 1 provides details about the audio recorded consultations. Audio recordings were transcribed verbatim, and observation notes were added when relevant for interpretation of the speech (eg, who was present, what happened during periods of silence, objects patients or doctors pointed to or showed each other). In addition, we collected information from medical records to extract HF history, discharge letters and current prescriptions.

We have used the Strengthening the Reporting of Observational Studies in Epidemiology cohort checklist[31] to report how the study was planned and conducted.

Data analysis

This study used Microanalysis of Clinical Interaction (MCI)[32], which begins openly, directed by the overall purpose of the project (in this case, how doctors respond to patient utterances regarding what they are doing at home with their prescription medication). Focused inductive work involved listening to recorded consultations and noting observations on transcripts. Working iteratively with a subsample of the material, researchers use MCI to derive essential criteria for how to recognise the phenomenon and develop detailed operational definitions (eg, what constitutes a response). Researchers document the analysis in a coding manual, rendering it transparent and reproducible; they then apply the coding to all recordings to build a systematic and comprehensive collection of the phenomenon of interest. According to MCI, once the collection is complete, researchers characterise the phenomena inductively (eg, how various types of responses differ). The procedures used in MCI can shed light on relationships between the phenomenon of interest and relevant variables such as patient characteristics, the setting or features in the interaction.

In the previous study, we had defined and identified patients' Medication Adherence Disclosures in Clinical Interactions (MADICI)[30], that is, patient utterances to their doctor during medical consultations disclosing

Table 1 Characteristics of participants and audio recorded consultations

Patients: Persons (+65 years) diagnosed with heart failure	n=25
Female, n (%)	8 (32%)
Age, median (min–max)	76 (67–90)
NYHA classification III, IV*, n (%)	15 (60%), 7 (28%)
Ejection fraction†, EF% below 35%	11 (44%)
Cognitive function‡, median score (min–max)	23 (16–30)
Diagnosed with HF more than 3 months ago†, n (%)	15 (60%)
Diagnoses according to discharge letter, median (min–max)	3 (1–6)
Number of medications at hospital admission†§, median (min–max)	6 (0–14)
Number of medications at hospital discharge†§, median (min–max)	8 (4–16)
Patients with the following heart medications prescribed in their regimen†§, n (%)	Hospital admission/ Hospital discharge
ACE inhibitor or angiotensin receptor-neprilysin inhibitor	19 (76%)/24 (96%)
Antiarrhythmic medication	9 (36%)/14 (56%)
Anticoagulant or antiplatelet	20 (80%)/24 (96%)
Beta-blocker	15 (60%)/22 (88%)
Diuretic for regular or intermittent use	13 (52%)/16 (64%)
Mineralocorticoid receptor antagonist	5 (20%)/15 (60%)
Sodium-glucose co-transporter-2 inhibitor	7 (28%)/19 (76%)
HMG-CoA reductase inhibitor (statin)	20 (80%)/17 (68%)
Hospital doctors	**n=23**
Female, n (%)	17 (74%)
Age, median (min-max)	31 (24–50)
Professional role as junior doctor, n (%)	22 (96%)
Years of work experience, median (min–max)	2.8 (0–17)
General practitioners (GPs)	**n=25**
Female, n (%)	8 (32%)
Age, median (min-max)	50 (35–71)
Professional role as junior doctor, n (%)	5 (20%)
Years of work experience, median (min–max)	16 (1–44)
Audio recorded consultations	**n=74**
First heart ward visit in hospital (n=24), duration mean (min–max)	14.7 min (6–23)
Discharge visit from hospital (n=25), duration mean (min–max)	12.2 min (5–25)
First follow-up visit with GP (n=25), duration mean (min–max)	22.8 min (10–44)
Days from hospital admission to hospital discharge visit, median (min–max)	6 (1–20)
Days between hospital discharge and follow-up visit with GP, median (min–max)	10 (2–43)

*NYHA Functional Class[3], according to patients' medical records. Class III (HF symptoms with excertion), Class IV (HF symptoms at rest).
†According to patients' medical records.
‡Cognitive function measured with MoCA assessment version 8.1[57], median score (range). Cognitive impairment scale: Moderate (10–17); Mild (18–25); Normal (26+).
§Prescribed for regular use.
MoCA, Montreal Cognitive Assessment; NYHA, New York Heart Association.

their medication adherence, recognised by two essential elements: (1) the utterance is about medications prescribed for use at home AND (2) it includes information about patients' actions, experience or stance regarding medications. Of the 427 MADICI we identified in the 74 audio recorded consultations, we had found that 235 (55%) included information signalling either a potential risk for non-adherence or outright non-adherence.[30]

In the current study, we used MCI inductively to explore whether and how doctors addressed these 235 problem

disclosures, and how patients responded when doctors' addressing actions were suggestions for adherence support. How we recognised and characterised MADICI is documented with illustrative examples in our MADICI Codebook, which is available in online supplemental file 1.

We made three initial assumptions in the current study: (1) patients may disclose problems about different topics (eg, experiencing adverse effects and forgetting to take medications) that they may reiterate in the same consultation or in other consultations, (2) different types of problems may trigger different addressing actions from doctors and should be analysed separately (eg, actions doctors take to address how the patient is experiencing adverse side effects would be different than those to address the patient forgetting to take medications) and (3) doctors' addressing actions during consultations may be communicated to patients verbally or may be evident in their documented actions.

The analysis consisted of three steps (see figure 1). Step 1 was to delineate our unit of analysis, which was any discussion about a patient's specific adherence problem during one consultation, including anything relevant in the doctor's written documents about that patient's treatment plan. Accordingly, for each patient, we collected the previously identified problem disclosures about the

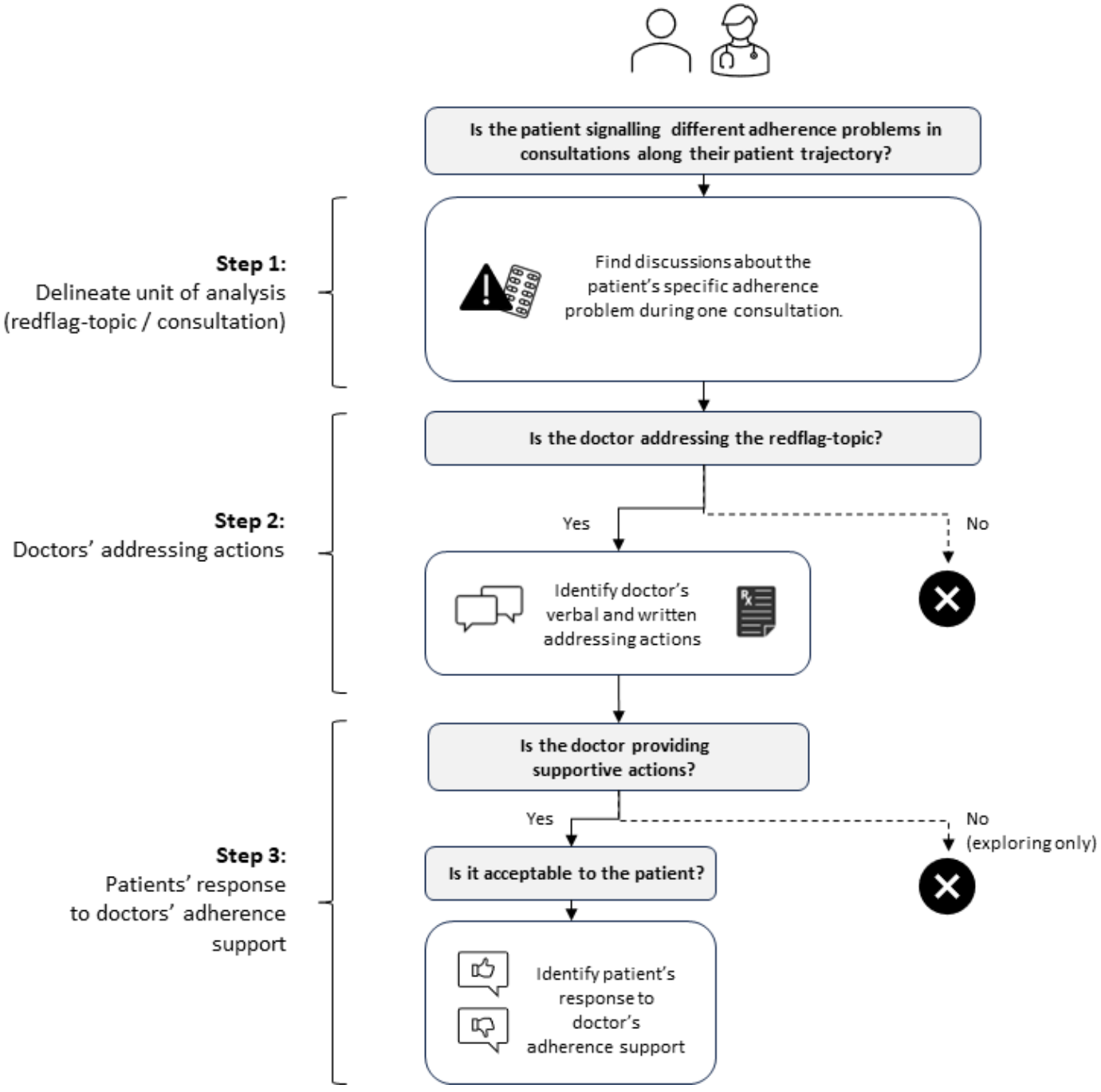

Figure 1 Flow chart of analytical decisions.

same adherence problem into topics (coined as red flag topic). To exploit the study's longitudinal design, the patient's first disclosure about the specific problem in any consultation was the entry point for examining all consultations for discussions on that topic. We categorised red flag topics informed by the 'Perceptions and Practicalities Approach' (PAPA) framework.[18] The PAPA framework focuses on how patients interact with their agreed on treatment and proposes that patients' adherence to medications is enhanced or reduced by their ability or motivation (or both) to use their medications as prescribed. Whereas motivation influences patients' conscious (ie, intentional) decision to use or not use their medications, patients with limited practical resources and capabilities are prone to unintentional non-adherence. For each red flag topic, we considered whether the patient signalled a perceptual/motivational adherence problem that could ultimately lead to intentional non-adherence, or a practical/capability barrier that could ultimately lead to unintentional non-adherence.

In step 2, we developed operational definitions of doctors' communicative actions aimed at addressing the red flag topic, and we noted when these actions included adherence support. Then we used a mixed-effects logistic regression to investigate the potential differences between doctors addressing actions of red flag topics that we categorised as either 'perceptual' or 'practical' in step 1. In the regression, we used doctors' addressing action as the outcome variable, perceptual/practical as fixed effect, and consultation setting (first ward visit, discharge visit, GP visit) as random effect. Analyses were performed using R (V. 4.4.2) in Rstudio (V. 2023.06.0).

In step 3, we developed operational definitions to identify what feedback doctors received from patients' responses to their adherence support, that is, whether patients indicated the adherence support was acceptable. The purpose of this step was to ascertain whether doctors' supportive actions were tailored to patients' preferences, which foreshadowed the likelihood of those actions improving patients' adherence situation in the foreseeable future. In consultations where patients changed their preferences during the interaction, we made our analytical decision based on patients' final response. The coding manual with illustrative examples is available from the first author on request.

We worked iteratively within each step and completed each step before starting the next. When developing operational definitions, we purposefully selected data from three newly diagnosed patients and three patients with known HF. As the definitions coalesced, we gradually expanded our analysis to the full dataset. Developing the definitions started with one researcher (CF) building a collection of examples demonstrating the phenomena of interest in specific, observable actions by listening to audio recordings and investigating written materials. CF used transcripts in Microsoft Excel for reference and for recording all analytical decisions. CF analysed and coded all interactions, meeting with JG regularly to discuss the collection, resolve difficult cases by consensus and refine definitions. Twice we presented examples and preliminary definitions for peer review to a multidisciplinary team of health communication researchers attending our MCI workshop. In addition, CF held individual meetings with one patient representative and several senior medical doctors (cardiology, acute care, general practice) to discuss the relevance of our analytical approach for clinical practice.

Patient and public involvement

The MAPINFOTRANS project was planned with contributions from a user panel consisting of Ahus patient representatives. One user representative participated in MAPINFORTRANS Advisory Board and was consulted to discuss objectives for this analysis.

RESULTS

For each step of analysis, we present our definitions and examples developed during analysis as well as the quantitative results.

Topics of patients' disclosures of adherence problems

We identified 62 specific adherence problems (red flag topics) in the 235 patient disclosures, which could refer to risks of unintentional non-adherence (n=23, 37%) or intentional non-adherence (n=39, 63%). Unintentional adherence risks related to patients' internal or external practical problems, and particularly to: (1) healthcare systems-related barriers, (2) limited ability to organise intake of medications in use and (3) limited ability to recall or recognise medications in use. Intentional adherence risks related to patients' perceptions included: (1) negative stances, (2) negative experiences and (3) concerns or worries. Of the 62 problem disclosures, 34 (52%) were only mentioned during GP visits, 14 (23%) were mentioned in two of three consultations, and three problems (5%) were mentioned in all three consultations. Table 2 presents definitions, illustrative examples and frequencies of topics of patients' problem disclosures, categorised into types of adherence barriers and unintentional/intentional adherence risk. Details about all 62 red flag topics are provided in online supplemental file 2.

Patients disclosed up to four different adherence problems to their doctors along their patient trajectory; seven patients disclosed one problem, five patients two problems, eight patients three problems and five patients four problems. Analysing 3 key consultations along 25 patient trajectories, we identified that the 62 specific adherence problems appeared in consultations 82 times (recall that the unit of analysis was any discussion about a patient's specific adherence problem during one consultation).

Doctors' actions in response to patients' problem disclosures

We analysed doctors' verbal and written communicative actions to address patients' problem disclosures, just after

Table 2 Topics of patients' disclosures of adherence problems, grouped by patient-oriented adherence barrier

Topic of adherence problem disclosure (number of patients disclosing this topic)	Recognised when patients' problem disclosure includes information about:	Type of patient-oriented adherence barrier and non-adherence risk according to the PAPA framework[18]	Illustrative examples of patients' problem disclosures*
Healthcare systems-related barrier (n=4)	… external practical problems stemming from the healthcare system, for example, prescribing errors, unavailability of medications on the market.	Practical factor (eg, ability and resources), associated with risk of unintentional non-adherence.	► Patient is worried she has used the wrong dose due to different information in the discharge letter and pharmacy label. ► Patient reports being unable to fill prescription.
Limited ability to organise intake of medications in use (n=8)	… forgetting to take medications or having limited ability or resources to organise their medications on a regular basis.	Practical factor (eg, ability and resources), associated with risk of unintentional non-adherence.	► Patient reports being unable to dispense own medications. ► Patient forgets to take medications.
Limited ability to recall or recognise medications in use (n=11)	… inability to recall or recognise which medications they are using, as evident in inability to report that information during consultations.	Practical factor (eg, ability and resources), associated with risk of unintentional non-adherence.	► Patient is unable to report medication intake in accordance with prescribed regimen. ► Patient reports he does not recognise the medication the doctor is talking about.
Negative stance to medications (n=10)	… reduced motivation to take medications as prescribed (eg, wants to change, discontinuing).	Perceptual factor (eg, beliefs and motivation), associated with risk of intentional non-adherence.	► Patient reports symptoms he thinks are adverse effects and wants to reduce medications he believes are unnecessary. ► Patient has discontinued medication.
Negative experience with medications (n=21)	… negative experiences after using medications (eg, adverse drug reactions), but without mentioning a reduced motivation to adhere.	Perceptual factor (eg, beliefs and motivation), associated with risk of intentional non-adherence.	► Patient reports adverse effects. ► Patient reports lack of effect of medication.
Concerns or worries about medications (n=8)	… concerns or worries about benefits or preferences about their medications in use.	Perceptual factor (eg, beliefs and motivation), associated with risk of intentional non-adherence.	► Patient is worried about having (too) many medications. ► Patient is unsure why she needs medication.

*Full overview of the 62 red flag-topic descriptions is provided in online supplemental file 2
PAPA, Perceptions and Practicalities Approach.

the disclosure or later in the consultation, that could foreseeably change the patient's situation. These actions were broadly categorised into 'addressing' or 'not addressing' the patients' problem disclosure (red flag topic).

Doctors' addressing actions

We defined *addressing* as any communicative action that indicates that the doctor is orienting to the patient disclosure by: (1) Exploring the scope of the problem (eg, seeking more information about the patient's perception or adherence behaviour) AND/OR (2) Providing supportive actions to improve the patient's ability or motivation to adhere (eg, providing information, prompting, suggesting alternatives to manage the situation, co-reasoning about options, deciding to change prescriptions, ordering professional services).

We observed that the timing of doctors' responses to patients' problem disclosures varied greatly. Sometimes doctors would respond immediately, while other times they waited until the patient repeated it. Sometimes doctors delayed their full responses, reintroducing the topic later to discuss how to handle it. We observed some cases where the doctor simply changed the patient's prescription in response to the patient's disclosure without discussing it.

As an illustrative example, table 3 presents an excerpt from an interaction where the patient discloses an adherence problem to the GP, who addressed it. In this example, the patient reports forgetting to take medications (line t50-F-4), thereby signalling to the doctor an ongoing adherence problem. After an immediate response to clarify that 'them' refers to 'medications', the doctor proceeds to address the disclosure by (1) seeking more information about the scope of the problem (line t50-F-7) and (2) providing several types of supportive actions. These include ordering professional services, using alarms and daily routines to reduce the risk of forgetting (lines t50-F-9, t50-F-15), co-reasoning about these alternatives (lines t50-F-19, t50-F-21) and suggesting at the end of the consultation to 'wait and see' (line t50-F-23). The doctor provided no additional adherence support to the patient in writing. These addressing actions revealed the scope of the patient's non-adherence behaviour and provided the patient (and companion) with information that there are many options available to them to improve the situation. The original transcript in Norwegian with translation to English is provided in online supplemental file 3.

We defined that patients' problem disclosures remained *unaddressed* when doctors' actions were limited to utterances orienting away from the adherence problem by: (1) neutral, non-committal responses (eg, listening responses, reformulating to clarify), (2) pursuing biomedical issues (eg, symptoms, diagnostic tests), (3) changing the topic and (4) emotional and cognitive alignment. In the illustrative example below, from the first ward visit in hospital, the patient discloses how the effect of bumetanide limits his daily activities. This disclosure signals that the patient may have a low motivation to use this medication as prescribed. Here, the doctor immediately provides emotional support ('no that is a bit of a nuisance') before pursuing a biomedical issue about the medication ('Which colour is your urine, is it light or dark'):

> Doctor: But what is it like at home?
>
> Patient: Yes it is… straight after I have taken those pills [bumetanide prescribed for use at home] then I have to go to the toilet the next 3–4 hours. But it does not come … it is not a lot though. But I must go to the toilet, I cannot plan any activities as such.
>
> Doctor: No that is a bit of a nuisance.
>
> Patient: Yes, it is. But that's how it is.
>
> Doctor: Which colour is your urine, is it light or dark?

The patient brought up the same problem during the discharge visit when another doctor presented him with an updated medication list, still including bumetanide. Again, the doctor did not address it. Full transcript with coding notes for both consultations are available in online supplemental file 4.

Frequencies of doctors' addressing actions

Table 4 presents whether and how doctors addressed patients' problem disclosures in 82 consultations, organised by topic and consultation setting.

We identified 31 consultations during which patients disclosed problems associated with an unintentional non-adherence risk (ie, patients' practical problems). In 28 of these 31 consultations (90%), doctors addressed the patient's problem disclosure either by exploring it further (21 of 28 consultations), providing supportive actions (27 of 28 consultations), or a combination of both. The proportion of doctors who addressed patients' disclosures of practical problems was high in all settings.

We identified 51 consultations during which patients disclosed problems associated with an intentional non-adherence risk (ie, patients' negative perceptions). In 37 of these consultations (73%), doctors addressed the patient's problem disclosure either by exploring it further (23 of 37 consultations), providing supportive actions (36 of 37 consultations) or a combination of both. We observed differences between settings: Doctors addressed patients' negative perceptions disclosed during the first ward visits 3 of 8 times, 7 of 11 times during discharge visits and 27 of 32 times during GP visits.

We observed differences in how often doctors addressed patients' problem disclosures indicating different topics and investigated these further. Using a mixed effects logistic regression to estimate potential differences in doctors addressing patients' disclosures signalling practical or perceptive adherence barriers, we calculated the OR to be 4.79, with a 95% CI 1.25 to 25.83. This result indicates that it is nearly five times higher odds for doctors to address patients' practical adherence problems (eg, reduced ability to organise intake) to their perceptual problems (eg, negative experiences).

Patients' responses to doctors' supportive actions

We observed that patients' reactions to doctors' supportive actions varied greatly. While there were some clear indications of acceptance and some outright rejections, sometimes patients would indicate that they preferred another solution, for example, by co-reasoning with the doctor about alternatives or bringing forward ideas of their own. Sometimes there was just silence, which could either indicate that the patient responded only with visible action or did not respond at all.

Based on our observations, we decided to identify patient utterances signalling clear unacceptability to doctors' adherence support. Our rationale was twofold: (1) working with audio recordings we were missing co-speech gestures and facial expressions, thereby making it difficult to interpret patients' minimal verbal responses (eg, 'mm', 'yes', 'no') and (2) communication-based research has shown that there is a 'normative obligation' for patients to express agreement[27] rather than disagreement to doctors' suggestions, thereby making non-acceptability a more precise indicator for how well doctors' actions met patients' preferences.

Table 3 Illustrative example of an addressed disclosure

Red flag topic 50: Patient forgets to take medications. Indicated adherence barrier: Limited ability to organise intake of medications in use (practical problem, risk of unintentional non-adherence)			**Coding notes**
Line	**Speaker**	**First follow-up with GP**	
t50-F-1	Doctor (GP)	Do you feel it goes well to manage your own medications?	
t50-F-2	Patient	Yes…yes I believe so. I could have brought with me the dosette box here now to show you how I have put them in, but it is 5…6 medications that I use. Well, one thing that I am very bad at is to remember the names of those medications. So that tells me nothing.	
t50-F-3	Doctor (GP)	No, and it is not so easy because unfortunately it is so that it can be written one name on the medication and then you get something… then it is the generic name that they hand out from the pharmacy and then it gets…	
t50-F-4	Patient	Yes, yes, so…but then I read on the label, and then I lay out if it is morning and evening, so I put them out directly and then I take the next box. But then I have to admit that it happens that I forget to take them.	(Patient's first disclosure about this specific adherence problem in the consultation)
t50-F-5	Doctor (GP)	Medications?	
t50-F-6	Patient	Yes. And it can be both morning and evening.	
t50-F-7	Doctor (GP)	**But how often does that happen?**	Doctor seeks additional information about patient's adherence behaviour and scope of the problem
t50-F-8	Patient	It is probably once a week I have one or another like … that I go "damn, now I forgot it yesterday"	
t50-F-9	Doctor (GP)	**Because that is what potentially could be the reason why we should get home care nurses to perhaps follow that up a bit more, if you forget it too often. Of course, once in a while is no crisis, but if it is a regular occurrence that it happens…. But could you have an alarm on your watch that made a "pip-sound"?**	Doctor provides adherence support: Suggests (1) ordering professional services to take responsibility for management of medications, and (2) using alarms to alert medication intake
t50-F-10	Patient	I have been given that.	
t50-F-11	Doctor (GP)	**But one that gives a sound at regular times when you should take your medication**.	Doctor continues to suggest using alarms
t50-F-12	Patient	Yes… [patient sounds pensive]	(Interpreted as a listening response not as acceptance)
t50-F-13	Doctor (GP)	**It is possible to enter regular alarms if that could be easier**.	Doctor continues to suggest using alarms
t50-F-14	Patient	Yes… yes…[patient sounds pensive]	(Interpreted as a listening response not as acceptance)
t50-F-15	Doctor (GP)	**Or that you have a routine that you take them when you brush your teeth for example, right?**	Doctor provides adherence support (3) suggests using daily routines to support adherence.
t50-F-16	Patient	Yes, that is morning and evening	
t50-F-17	Doctor (GP)	Mm. It is about remembering it.	
t50-F-18	Companion to patient	It is lying in the middle of his kitchen table so… I suppose we could keep an eye on it too and then we can discuss what we think. Because we are there a lot and…	Companion suggests other options in response to patient's hesitation to doctor's suggestions
t50-F-19	Doctor (GP)	**Yes. No, because I understand that for** *patient name* **too, you think that…it is probably good to manage and keep track of it yourself as such**	Co-reasoning about adherence support.
t50-F-20	Patient	Yes yes yes	

Continued

Table 3 Continued

Red flag topic 50: Patient forgets to take medications. Indicated adherence barrier: Limited ability to organise intake of medications in use (practical problem, risk of unintentional non-adherence)			Coding notes
t50-F-21	Doctor (GP)	**And if that works then that is fine. But if it becomes that too often you forget to take it then it is …**	Co-reasoning about adherence support.
t50-F-22	Patient	Pft…I forget it once a week I suppose	
t50-F-23	Doctor (GP)	**But why don't you keep an eye on it, and then we can stay in touch**. [closing remarks]	Doctor suggests they should wait and see. Written adherence support: No additional support provided.

Doctors uttererances identified as addressing responses are highlighted in bold. We use italics to signal where we have replaced names and medication brands for anonymity and universal comprehension. Information required for comprehension is provided in (square brackets).

Patient acceptability

We defined *unacceptability* as patient utterances that included information that the doctor's supportive action was against their own preferences or indicated that it was unlikely to change their situation in the foreseeable future. We recognised patient unacceptability when (1) the patient response indicated prior knowledge (eg, information given did not fill a knowledge gap), (2) the patient did not seem convinced by the provided information (eg, gave counter arguments, alternative hypotheses), (3) the patient suggested other supportive measures for the doctor's consideration (eg, dose reduction, deprescribing), (4) the patient preferred to maintain the status quo (eg, wait and see), (5) the patient did not reject the supportive action outright but shared information that indicated a negative stance or negative experience (eg, told a history of a past experience that did not work) or (6) when the doctor's prompts were ineffective in revealing reliable information from the patient about their medication use.

Table 5 provides illustrative examples of how we recognised patient's signals of unacceptability to doctors' supportive action. The table presents problems that were addressed by doctors, with examples of doctors' supportive actions (not exhaustive) that the disclosures elicited. Original quotes in Norwegian with translation to English are provided in online supplemental file 5.

Frequency of patients' signals of unacceptability

Table 4 presents patients' feedback in response to their doctors' suggested adherence support. Nearly 40% of patients responded with negative feedback to their doctors' suggestions of adherence support. Most problems were discussed during the GP visit, and our results indicate that GPs' supportive measures were more acceptable to patients than those suggested by hospital doctors.

Patients disclosed topics about healthcare-related adherence barriers only to their GPs, whose supportive actions were always acceptable to patients.

Adherence problems repeated along patient trajectories

So far, all results have been based on single consultations, without taking the longitudinal design into account. Now we will present results for the patients who disclosed the same adherence problem in more than one consultation as they transitioned from hospital to home.

Nearly 50% of HF patients disclosed the same (potential) problem to their attending doctor in different settings. Most of these (n=10) had known HF. They contributed 17 topics in total, about these non-adherence risks: negative experience with medications (n=8), negative stance to medications (n=3), limited ability to recall or recognise medications in use (n=3) and limited ability to organise intake of medications (n=3). Two patients disclosed the same problem in all three consultations. Table 4 also presents a subanalysis of the topics these 12 patients discussed in consultations.

Ten of the 12 patients disclosed a perceptual problem, thereby indicating an intentional non-adherence risk. For two of these patients, none of their doctors addressed the problem. Of the remaining eight, four patients experienced that all doctors addressed their disclosures, and they accepted the doctors' supportive actions discussed in the GP visit.

Six of the 12 patients disclosed a practical problem, thereby indicating risks of unintentional non-adherence. Doctors always addressed these patients' problem disclosures. Patients who received help to recall which medications they were using always accepted their doctors' supportive actions (usually prompts about names and doses). In contrast, patients who struggled with keeping overview and organising their medications never accepted suggestions provided at the GP visit after returning home from the hospital.

DISCUSSION

This is the first explorative study to investigate how doctors and self-managing, older patients with HF discuss patients' disclosures of medication adherence problems with each other, and how such discussions evolve over

Table 4 Frequency of doctors' addressing actions and patients' feedback

Topic of patients' adherence problem disclosure	Patients' actions	Doctors' communicative actions in response to patients' dislosures			Patients' actions
	Visits with problems disclosed	Addressed	Addressed by exploring further*	Addressed by providing supportive actions†	Signalled unacceptability to adherence support‡
First ward visit (n=18)					
Healthcare systems-related barrier	0	n/a	n/a	n/a	n/a
Limited ability to organise intake of medications in use	3	2	2	1	1
Limited ability to recall or recognise medications in use	7	6	6	6	3
Negative stance to medications	2	1	1	1	1
Negative experience with medications	6	2	1	2	2
Concerns or worries about medications	0	n/a	n/a	n/a	n/a
Discharge visit (n=16)					
Healthcare systems-related barrier	0	n/a	n/a	n/a	n/a
Limited ability to organise intake of medications in use	3	3	2	3	1
Limited ability to recall or recognise medications in use	2	2	0	2	0
Negative stance to medications	5	2	1	2	2
Negative experience with medications	5	4	2	4	2
Concerns or worries about medications	1	1	1	1	0
Follow-up visit with GP (n=48)					
Healthcare systems-related barrier	4	4	4	4	0
Limited ability to organise intake of medications in use	6	5	4	5	3
Limited ability to recall or recognise medications in use	6	6	3	6	2
Negative stance to medications	7	6	5	5	2
Negative experience with medications	18	16	11	16	4
Concerns or worries about medications	7	5	1	5	1
Overall	**82**	**65 of 82 (79%)**	**44 of 65 (68%)**	**63 of 65 (97%)**	**24 of 65 (37%)**
Subanalysis for the 12 patients who disclosed the same problem in more than one consultation					
Limited ability to organise intake of medications in use	7	7	6	6	3
Limited ability to recall or recognise medications in use	7	7	5	7	2
Negative stance to medications	7	6	5	6	5
Negative experience with medications	16	10	7	10	4

*Doctor exploring the scope of the problem further.
†Doctor providing verbal or written supportive actions to improve patient's ability or motivation to adhere.
‡Patient utterance including information signalling doctors' adherence supportive action was against their own preferences or indicating it was unlikely to change their situation in the foreseeable future.

time and experience and as patients talk to different doctors. This study offers an 'inside view' of how doctors use their communication skills to address patients' potential or ongoing medication adherence problems, and how in turn, patients respond to their supportive actions. Given the persistently low medication adherence rates in this patient population, a better understanding of this information exchange in practice is valuable to inform practitioners, educators and researchers who work to improve adherence to HF treatment.

The findings showed that nearly 50% of HF patients disclosed the same (potential) problem to their attending doctor in different settings, suggesting that it was an ongoing or recurring issue. Nearly all of them reported problems associated with intentional non-adherence (perceptual issues), while 50% of them reported problems associated with unintentional non-adherence (practical issues). These findings are somewhat surprising given the fact that unintentional non-adherence is considered more common.[17 33] One explanation is that due to our

Table 5 Patients signals of unacceptability to doctor's supportive action

Topic of adherence problem	Doctors' supportive action	Doctors' utterance	Patient response	Coding notes
Red flag-topic 19: Patient is unable to report medications in use during medication reconciliation, hospital has misplaced medication list given by patient to ambulance personnel.	Provides prompts to trigger memory of medication names and number of daily medications.	"But then it also says that that you have used a tablet called *spironolactone*, -spironolactone. Can you remember it?"	"No I don't remember that, you understand."	Ineffective prompts: the patient is unable to provide reliable information about medication use.
		"It also says here [doctor's notes] that you use one called Lercanidipine."	"I think that sounds… the name sounds familiar."	
		"Do you remember how many blood pressure tablets you take in total?"	"Isn't it three I think. Or are there more?"	
		"It depends a bit, because the one called *spironolactone* also helps with blood pressure. So if you count it, then you have 4 tablets on that list here then."	"In total, I guess… it's 6 or 7 tablets every morning. But you know what I remember…I must check it a little bit myself too."	
Red flag-topic 47: Patient reports being unable to keep overview and dispense own medications.	Discharge letter.	[Gives discharge letter to patient]	[Reads discharge letter] "I do not understand any of this." "No, the home-nurse services must take care of this."	The patient provides counterarguments and suggests other supportive measures for the doctor's consideration.
Red flag-topic 4: Patient reports struggling to keep own medication list updated and worries about taking medication incorrectly as a consequence.	Advises patient to memorise all medications in use and continue organising medications as before.	"Yes, it often does. There are a lot of people who have high blood pressure and diabetes, they end up somewhere between 10–12 medications. Also quite healthy people who are still working. But it is always a good idea to try to remember it yourself, to remember the names. Because suddenly you end up in a situation… You have worked very hard in your professional life, so you probably remember technical things well, you have a good memory."	"I think I remember the whole list of medications."	The patient does not reject the supportive measure outright, but the combination of hedging his response ("I think I remember") after disclosing information (via red-flag topic) that he feels a loss in personal control that relies on his cognitive abilities indicates that doctor's advice is unlikely to improve the situation.
Red flag-topic 5: Patient is worried about having (too) many medications.	Provides information about necessity of medications and indicates potential reduction in number of medications if symptoms change.	"So a lot of it is…at least three of the medications are to bring your pulse down, your heart rate. So it is quite possible that that they might be removed. So there may be less medications."	"Yes it could be… maybe I can get new medications from the hospital too now." (patient repeats being worried about too many medications later in the consultation.)	The patient displays scepticism ("could be…", "maybe"), indicating a lack of being persuaded by the information provided.

Continued

Table 5 Continued

Topic of adherence problem	Doctors' supportive action	Doctors' utterance	Patient response	Coding notes
Red flag-topic 24: Patient does not understand need for medication and experiences side effects of medication.	Provides information about benefits and necessity of medications.	"It is because you have known coronary disease from before. So with you we would like to have a very strict target on your cholesterol."	"I have understood that."	The patient response indicated prior knowledge.
		"I noticed your cholesterol was at 1.2, that is the dangerous cholesterol, LDL-cholesterol. That is good. That is actually very low. But with you who have a known coronary disease, and who has heart failure because of that, then the target is that you should be below 1.4."	"I am below 1.4."	The patient argues that the level is where the doctor says it should be, displaying a lack of being convinced by information provided.
	Indicates possibility to reduce dose in the future.	"That you are. But it can be useful for you to be aware that if you should notice side-effects of that *atorvastatin* that you use, then it can be possible to reduce the dose a bit now that you have started with *amiodarone*. We have not made any changes now, but…"	"Yes. No, but really when I'm thinking… and a little less, because it drains a lot of energy." "I have no energy. You have to fight for everything, to manage to do something. And I think it is exhausting."	The patient provides counter-arguments, emphasising current adverse effects.
Red flag-topic 16: Patient expresses negative stance to new dosing schedule and later discloses omitting doses.	Provides information about benefits and necessity of medication.	"I understand that. But the problem is that if you do not use it [bumetanide] then your heart begins to fail a little more and more."	"Yes, yes, if I am home then its fine, right. But if I am going long distances in the car and such, then I will have to push it a bit."	The patient provides counter-arguments and suggests other supportive measures for the doctor's consideration.

recruitment process, patients were more self-efficacious than average HF patients, thereby having the ability to manage their medications well. Another possible explanation for this finding might be patients under-reporting problems since they may prefer to withhold information about their intentional 'medical misdeeds'.[25 34] We observed that doctors' questions were mainly focused on reconciliation of which medications the patient had been prescribed by other doctors, often failing to follow-up with questions about how patients were managing to use them at home (see table 3 for a good example of eliciting the latter). This observation may be due to time constraints or unawareness of the distinction between the two, but it can also be due to insufficient training in how to elicit information about patients' adherence behaviour. Health communication research recommends doctors to 'ask-tell-ask',[15] using open, non-judgemental questions about patients ability to manage their medication intake,[35–37] adding explicit questions for precise information about omitted doses.[38] This approach also gives doctors the possibility to discover and resolve patients' misconceptions.[39]

A second key finding was that most adherence talks took place at the GP visit. Possible explanations for this observation include: (1) junior hospital doctors may prefer to defer challenging discussions (eg, emotional and time-consuming talks) to the patients' GP who has an established relationship with the patient[11 40 41], (2) patients may prefer to discuss problems with their long-standing doctors[12 30 42 43]and (3) before patients can assess their ability and motivation to adhere to their medications and formulate 'complaints', they need time to experience what it is like to use them.

A third key finding was that these doctors addressed most of the patients' disclosures of medication adherence problems, sometimes by exploring the problem further but most often by providing supportive actions. This finding indicates that doctors were sensitive to and acted on such disclosures, which aligns with previous studies

reporting that doctors feel responsible for addressing underlying factors for non-adherence.[23 38] However, we found that when doctors addressed patients' disclosures, they were five times more likely to handle problems associated with unintentional non-adherence (eg, signals of forgetting doses, inability to manage complex regimens, prescription errors) than perceptual problems associated with intentional non-adherence (eg, signals of negative beliefs, low motivation to take medications). When asked, non-adherent HF patients who became adherent decided to do so after understanding how poor their prognosis was without medications[12], thereby indicating the pivotal role prognostic talk might have on intentional non-adherence. Though prognostic talk was outside the scope of this study, our impression was that doctors avoided prognostic talk, at least in their responses to patient disclosures. They instead emphasised (biomedical) benefits and necessity of using troublesome medications when patients signalled low motivation to use them (See red flag-topic 5, 24 and 16 in table 5 for examples). Previous studies showed that doctors avoid prognostic talk with HF patients when possible[11], which is echoed by patients.[12–14 44] Another explanation may be that doctors are unsure how to handle situations where patients signal that their preferences conflict with HF guidelines. Accommodating patients' wishes by deviating from the best documented regimen for prolonging patients' lives and reduce hospital admissions[3 4] is likely to challenge doctors' professional standards as well as leave them vulnerable to formal complaints.

Finally, we found that one in two medication adherence problems patients disclosed remained unresolved. Often it was as if patients and doctors talked past each other. Problems remained unresolved due to: (1) doctors did not address patients' adherence problem disclosures or (2) when doctors addressed it, patients signalled that it was against their preferences or unlikely to change their situation. There are many salient reasons for why doctors left patients' disclosures unaddressed, including missing the (significance of the) information, downplaying adherence talk given the institutional setting[45], in addition to those previously mentioned. In this study, we found that nearly 40% of patients indicated that doctors' supportive actions were unacceptable to them, leaving their risk of non-adherence unchanged (tables 3 and 5 provide illustrative examples). Patients using their agency to negotiate treatment decisions have been studied in other settings[27 46 47], indicating similar levels of unacceptability to doctors' recommendations.[48] The conceptual core of 'medication adherence' builds on respect for patient autonomy and patients' agreement to doctors' recommended treatment plan.[36 49] Therefore, doctors need training and support to develop skills to negotiate and tailor treatment recommendations, both of which are difficult to master in practice.[50–52] To conclude, we propose three areas to improve adherence talk: (1) Ensure that all doctors have access to patients' current prescriptions in one national database, so that doctors can spend less time reconciling what is prescribed and more time assessing patients' ability and motivation to adhere, (2) train doctors in patient-oriented decision-making regarding medications and how to talk to HF patients about their prognosis, and (3) provide doctors with a 'toolbox' for how to negotiate and tailor HF treatments to patient preferences.

Strengths and limitations

The main strengths of this study include: (1) Our findings based on authentic consultations, at three selected time points when guidelines recommend doctors reconcile patients' prescriptions and talk about their medication adherence.[19 20] To explore qualitative aspects of adherence talk, a sample of 74 audio recorded consultations and medical records from 25 patient trajectories have high information power.[53] (2) Access to patients' medical records allowed us to discover doctors' written adherence support not evident from the dialogue. (3) Our coding manual, available on request, is transparent and reproducible,[54] allowing others to apply it in other contexts, ultimately discovering which patterns are unique and which are more universal.

Main limitations of this study include: (1) We recruited patients from one hospital ward, limiting generalisability. However, quantification and comparisons were not intended to support any universal claims; they simply represent the distribution and patterns in the material analysed. (2) All percentages in this study must be considered with caution, given that our sample of 25 patients is not a representative sample of the Norwegian HF population. Due to our inclusion/exclusion criteria and recruitment process, patients may have been less frail than the average HF patient on the heart ward (MAPINFOTRANS included an extended home interview, and several eligible patients indicated they felt too poorly to receive visitors when declining study participation). However, the sample is relatively close in some descriptive statistics to the recent ESC position paper[55] and a Norwegian nationwide study.[8] (3) The study situation, especially due to an observer recording the consultation, may have led to more talk about medications and 'best practice behaviour' from patient and doctor.[56] (4) The doctor's supportive actions were not vetted by other clinicians for their appropriateness in the given situation.

CONCLUSIONS

This exploratory study set out to investigate how doctors respond to patients' medication disclosures indicating a potential or ongoing adherence problem, and in turn, how patients respond to the doctors' supportive actions that their disclosures elicited. We found that the doctors were more likely to address patients' adherence problems associated with unintentional non-adherence risks than those associated with intentional non-adherence risks. Even when doctors attempted to address HF patients' medication adherence problems, half of the problems

remained unresolved, usually because patients indicated that the doctor's suggestions were against their preference.

Author affiliations
[1]Institute of Clinical Medicine, University of Oslo Faculty of Medicine, Oslo, Norway
[2]Health Services Research Unit, Akershus University Hospital, Lørenskog, Norway
[3]Department of Cardiology, Akershus University Hospital, Lørenskog, Norway

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X Pål Gulbrandsen @palgulbrandsen

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Ethics approval This study involves human participants but following review of the project description, the Regional committee for medical and health research ethics concluded that MAPINFOTRANS was exempt from review (ref. 273688). Data used in this study have been collected, handled and stored according to the procedures approved by the Data Protection Officer at Akershus University Hospital (ref 2021_146). Participants gave informed consent to participate in the study before taking part.

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ORCID iDs
Christine Frigaard http://orcid.org/0009-0007-3956-972X
Henrik Schirmer http://orcid.org/0000-0002-9348-3149
Pål Gulbrandsen http://orcid.org/0000-0001-7434-5392

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