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The effect of physician self-disclosure on patient self-disclosure and patient perceptions of the physician

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ABSTRACT

Objectives: Physician self-disclosure is typically seen as patient-centered communication because it creates rapport and is seen as an expression of empathy. Given that many physician behaviors affect patients differently depending on whether they are shown by a female or male physician, we set out to test whether physician self-disclosure affects patients' intentions to self-disclose and patients' perceptions of their physicians depending on physicians' gender.
Method: Two hundred and forty-four participants were recruited and randomly assigned to read one of 4 vignettes as if they were the patient in the dialogue (analogue patient design). They were then asked to report how they would react to the physician and how they perceived the him or her.
Results: Physicians who self-disclosed were perceived as more empathic than physicians who did not, regardless of physician and patient gender. Physician self-disclosure had an effect on the behavioral intentions of the analogue patients, and this was moderated by physician gender. Analogue patients indicated to be more willing to self-disclose to female than to male physicians who self-disclosed.
Conclusion: It is important to consider physician gender when training physicians in patient-centered communication because the same behavior can have different effects on patients depending on whether it originates from a female or a male physician.
Practical implications: Physicians can use self-disclosure to express empathy. When female physicians do so, they might obtain more personal information from patients, which can positively affect diagnosis and treatment.

1. Introduction

Self-disclosure is defined as the act of revealing private information about oneself as well as expressing motives, needs, wants, goals, fears, and feelings in general [1]. It plays a major role in developing, maintaining, and enhancing close relationships [2]. In the present research, we stick to a definition of self-disclosure that refers to intentional, "verbal" expressions about the self; thus, we define *physician self-disclosure* as any statement made by a physician to a patient that describes the physician's personal experience [3]. Physician self-disclosure as we use it does not include nonverbal cues, such as whether they express emotions in their face or how physicians dress.

Physician self-disclosure can be seen as a means to create rapport and express empathy [4] and thus it would be part of a patient-centered communication style, which builds on discussions and decisions that involve shared information, compassionate and empowering care provision, sensitivity to patient needs, and relationship building [5]. Self-disclosure also encompasses the process of one person affecting the actions, attitudes, or feelings of another [6]. For example, Frank, Breyan, and Elon [7] stated that physicians can motivate their patients to adopt healthy habits through sharing of their own personal healthy behaviors, which improves physician credibility. Therefore, as an interpersonal influence strategy, physician self-disclosure plays a vital role in patient-centered communication.

Self-disclosure during medical encounters has shown promising results in strengthening therapeutic relationships as it engages patients actively during medical interactions [6]. However, physician self-disclosure can also be seen as a violation of professional and personal boundaries [6], and research is still not clear as to whether physician self-disclosure is beneficial or damaging to the patient. Some studies have demonstrated positive effects on patient outcomes [8,9] whilst others have demonstrated no or negative effects on patient outcomes [10,11]. These inconsistencies in the literature could be due to different data

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collection methods (group discussions, participant interviews, or patient visits) [12] or to different situational factors such as the topics of disclosure, or the gender of the discloser and the recipient of the disclosure [13]. In fact, the effects of self-disclosure are moderated by individual differences such as gender [14] and one of the major issues in self-disclosure theory and research is gender [15]. In their meta-analysis, Dindia and Allen [15], found that, generally, women disclose slightly more than men, but the effect size was not homogeneous across studies. They also found several moderator variables for the effect of gender on self-disclosure such as the gender of the recipient of the disclosure: female-female self-disclosure was highest, male-male self-disclosure was lowest, and opposite-gender self-disclosure was in between [15].

In the health care context, it is documented that female and male physicians communicate differently with their patients [6,16] and it has been shown that female physicians tend to disclose more information about themselves compared to male physicians [17]. We conducted research on gender differences in physician self-disclosure [18] and showed that male physicians who care about their patients and are interpersonally oriented use more self-disclosure. Male physicians also show more self-disclosure when faced with potentially vulnerable patients or patients they know well.

The question we ask in the current research is not whether female and male physicians differ in how much and what they self-disclose to their patients, we ask whether physician self-disclosure is perceived and reacted upon differently when it comes from a female or a male physician. In other words, when female and male physicians self-disclose in exactly the same way, will their self-disclosure still evoke different results? We test this by experimentally manipulating physician gender and the level of physician self-disclosure in an experimental design. This is the only way we can rule out that actual differences in female and male self-disclosure affect the perception and reaction of the patients. We hold constant the self-disclosure of the woman and man doctor in order to test whether the simple fact of knowing that the behavior stems from a female or a male physician affects patients. Although physician self-disclosure is indicative of empathy as a facet of patient-centered communication, it is possible that, depending on physician gender, its effects on patients differ.

1.1. Gender and self-disclosure

The earliest research on self-disclosure found that men revealed less about themselves than women [19] and a meta-analysis by Dindia and Allen [15], showed that women disclosed slightly more than men. One of the most consistent findings regarding the effect of self-disclosure in interpersonal relationships is *self-disclosure reciprocity* [20], which refers to the process by which one person's self-disclosure elicits another person's self-disclose [21]. Several researchers [22–25] have shown that self-disclosure reciprocity is not only crucial for the maintenance of relationships but also determines how a relationship develops and evolves. It allows both members of the interaction to show their receptiveness (i.e., as listeners and disclosers) and thus balancing the communication process, i.e., there is no power relationship since both are showing vulnerability [26].

Gender plays a role in self-disclosure reciprocity. Cash [27] and Wan et al. [28], suggest that both men and women disclose at higher rates when paired with a female recipient. However, Mulcahy [29] found female same-gender disclosure to be greater than male same-gender disclosure whilst other studies report greater levels of self-disclosure to opposite-gender targets [30,31].

We set out to test how self-disclosure of women and men doctors affects patients and more specifically, how self-disclosure reciprocity plays out in the context of physician-patient relationships. Based on previous findings [15,19], we expect patients to engage in more self-disclosure reciprocity to female compared to male physician who self-disclose.

H1. *Patients show more self-disclosure reciprocity to female physicians who self-disclose compared to male physicians who self-disclose.*

1.2. Perception and self-disclosure in the physician-patient interaction

Derlega and Chaikin [32] found that in the general population, women who self-disclose are perceived as better adjusted and more likable than women who do not, and the opposite was true for men who self-disclosed. Self-disclosing women were evaluated less favorably than women with medium levels of self-disclosure when their self-disclosure was about aggressive feelings of competitiveness. Self-disclosing men were evaluated less favorably than men with medium and low levels of self-disclosure, regardless of disclosure topic [33]. This means that depending on the gender of the discloser, all disclosure topics are not received identically by their recipient and that gender of the discloser plays a role.

These differences most likely reflect societal beliefs about how women and men should behave: men are expected to be tougher, stronger, more aloof, and emotionally inexpressive, while women are expected to be nurturing and expressive and self-disclose more [34].

In the health care context, female and male physicians communicate differently with their patients [6,16] and existing research finds differences in the effect of female and male physician self-disclosure. In the present research, we focus on the receiver of physician self-disclosure. There is evidence that female physicians are perceived to be more empathic and understanding than male physicians [35,36]. Knowing that physician self-disclosure can be seen as a means to create rapport and express empathy [4], we expect that female physicians who self-disclose will be perceived as more empathic than their male counterparts.

H2. *Female physicians who self-disclose are perceived as more empathic than male physicians who self-disclose.*

Often, patients bring traditional gender role expectations or stereotypes to the medical encounters and respond to physicians based on these expectations [6]. For example, Shapiro et al. [37], found that female patients viewed female physicians as having both instrumental (technical) and expressive (interpersonal) qualities/behaviors. On the contrary, patients tended to view male physicians as low on both dimensions [6]. Eagly and Mladinic [38] also demonstrated that, in female physicians, behaviors that convey more interpersonal orientation are linked to more patient satisfaction, which confirms gender stereotypes. However, as shown by a study by Blanch-Hartigan et al. [39], who looked at gender bias in patient perception of patient-centered behaviors, perceivers of patient-centered behaviors may think of communication skill as so intrinsic to the female role that they see the skilled female as a good woman rather than a good physician, leading to not rating female physicians with greater competence. Male physicians, however, would get credit for patient-centered behavior because it is less expected from them.

H3. *Male physicians who self-disclose are perceived as more competent than female physicians who self-disclose.*

A study by Weisman [40] stated that studies of patient satisfaction with care received (regardless of the gender of the physician) show that a major dimension of patient satisfaction corresponds to this interpersonal aspect of medical care, also

defined as the "affective quality". Assuming the interpersonal dimension is indeed a major factor determining patients' satisfaction with medical care, and assuming women physicians are perceived by patients as more likely to excel at this dimension of care (such as empathy like mentioned above), one would expect patients to prefer female to male physicians. However, it is not necessarily the case because several previous studies have shown that the quality of the medical visit can be impacted in part by patients' preexisting stereotypes and expectations [16,41].

Specific studies so far noted that despite spending more time with patients and more frequently using a patient-centered behavior, women physicians are not evaluated as highly by patients as their male colleagues [16,42,43]. Therefore, despite female physicians being perceived more positively than male physicians, patient outcomes might not necessarily be more positive. With physician self-disclosure considered as a patient-centered behavior [44,45] we hypothesize the following:

H4. *Male physicians who self-disclose will have patients with more positive consultation outcomes than female physicians who self-disclose.*

In sum, the aim of the current study is to investigate the role of physician gender and physician self-disclosure on how participants react to the physician (i.e., self-disclosure reciprocity), patient consultation outcomes, and on how participants perceive the physician.

2. Method

2.1. Participants

Two hundred and forty-four undergraduate and graduate students from different majors from two Universities in the French speaking part of Switzerland participated in this study. Thirty-seven were excluded from the study due to failure in the manipulation check (explained in more detail below). In the end, we had a total of 207 participants (113 men and 94 women). A power analysis, G*Power [46] assuming a medium effect size, a power of 0.90 and an Alpha level of .05, 206 participants are needed. We thus had enough power to detect if an effect was present.

Participants were recruited through the university subject pool, which allows participants' recruitment based on a variety of selection criteria, such as age, gender, faculty, or previous participation to specific experiments. The subject pool is composed of students majoring in different domains. They subscribe to the pool and obtain payment when participating in a study. Our sample identified themselves most commonly as White (72.95%), mixed background (14.01%), Asian (4.83%), Black (3.38%) or other (4.83%). Their mean age was 21 years (range = 18–34 years). Inclusion criteria for the study were: aged above 18 years and be fluent in English. Participating in the study took on average 15 min and participants were remunerated the equivalent of 10 US dollars at the end of the study.

We used analogue patients which are defined as "untrained viewers given the task of viewing and rating their impressions of a medical interaction while taking on the patient role" [47]. Research shows that analogue patients perceive medical communications in the same way as do clinical patients [48] and that using them is an effective and reliable means of gathering patient perception data about provider-patient interactions [49]. This research was approved by the university's ethics committee.

2.2. Procedure

This study happened in a computer room where every participant was in front of a computer and each computer had a separator to prevent participants from communicating with each other or to look at each other's dialogues on the screen. Each session had between 10 and 20 participants. Thirteen sessions of data collection were necessary to complete the study; they ran over the course of one week.

Upon arrival, participants were greeted by the main researcher and then assigned to a computer, where they gave their informed consent for the study (on screen) and were instructed to put themselves in the shoes of a patient, which is the analogue patient design. The entire study was administered on a computer screen via Qualtrics, uploaded by the first author. Participants were informed that they would read a dialogue a physician had with a patient and that we would then ask them how they perceived that physician and how this physician would affect them if they were the patient of this physician. We manipulated whether the physician in the vignette was a woman or a man and whether the physician self-disclosed or not, resulting in 4 vignettes, developed by the researchers.

At the outset of the study, participants filled in a questionnaire, that was pilot tested prior to the experiment, measuring their preference for a patient-centered physician communication style. Participants were randomly assigned to read one of the 4 vignettes as if they were the patient in the dialogue. After having read the dialogue, they were asked to report their willingness to self-disclose to the physician in the vignette, satisfaction with the physician, trust in the physician, perceived physician competence, perceived physician empathy, intended treatment adherence, and willingness to return to this physician if they were the patient of this particular physician. At the end, participants had the opportunity to ask questions about the study. They were thanked and paid.

2.3. Materials

For this study, the researchers developed the vignette material to study participants' perspective on physician self-disclosure. Each vignette contained a scripted dialogue between a physician and a patient.

We manipulated the gender of the physician and the degree of physician self-disclosure, resulting in 4 different vignettes: a female physician self-disclosing, a female physician not self-disclosing, a male physician self-disclosing, and a male physician not self-disclosing. All four vignettes can be found in the Appendix.

Each vignette consisted of text describing the context in which the patient consulted the physician (i.e., the patient has been feeling ill for the past few days and has been experiencing severe head and stomach pains. Their usual physician is on holidays, so they decide to seek assistance by another physician. They never met this physician before.) and a transcript of how the physician communicates with the patient. Only the physician statements were in the vignette; we simply indicated when the patient spoke but not what was said. The patient's gender was not indicated. Each script with self-disclosure contained 8 instances of physician self-disclosure based on the definition of self-disclosure e.g. *"I am personally very sensitive to stress"; "In my case for example, my headaches resolved after I got some rest. But again, everyone is different"; " . . . my son called me and had an important matter he wanted to talk about"* and the scripts without self-disclosure were identical in content except that they did not contain self-disclosure statements e.g. *"Many people are very sensitive to stress"; "In some cases, the headaches resolved after getting some rest. But again, everyone is different."; " . . . I had to take a phone call, and this took some time"*. Each vignette was validated by two senior researchers for consistency.

2.4. Measures

2.4.1. Willingness to self-disclose

To what degree the participant indicated to be willing to self-disclose themselves was measured with four items [50] on which participants indicated their degree of agreement on a 4-point Likert scale (1 = not at all, 4 = yes completely and fully). Sample items are: "*Would you be willing to discuss feelings of sadness*"; "*Would you be willing to discuss issues with sexual orientation*" and "*Would you be willing to discuss concerns about excessive alcohol use*" (M = 2.57, SD = 0.76, Cronbach's alpha = .82).

2.4.2. Trust in physician

Analogue patient trust was assessed with four items: "I have full confidence in this doctor about the therapeutic decisions that concern me.", "I would have no fear of putting my life in the hands of this doctor", "This doctor only thinks about what is best for me" and "In the end, I have total confidence in this doctor" previously used [51,52]. Participants indicated their degree of agreement on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree; M = 3.26, SD = 0.98, Cronbach's alpha = .90).

2.4.3. Willingness to return to this physician

We measured how willing the participant was to return to his physician with three items from the likelihood of future visits scale [50] in which participants indicated their degree of agreement on a 5-point Likert scale (1 = definitely not, 4 = definitely yes). The items were: "*Would you want to see this doctor again if you needed a routine physical*"; "*Would you want to see this doctor again if you had a bad cough and fever*" and "*Would you want to see this doctor again if you had some very private concerns*" (M = 3.16, SD = 0.96, Cronbach's alpha = .67).

2.4.4. Satisfaction with physician

Analogue patient satisfaction was assessed with three items from a scale previously used in the field [49,51]: "*I am totally satisfied with the consultation with this doctor*", "*Some elements of my consultation with this doctor could have been improved*" (reverse-scored item), and "*I am not completely satisfied with my consultation with this doctor*" (reverse-scored item). Participants indicated their degree of agreement on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree; M = 3.14, SD = 1.01, Cronbach's alpha = .88).

2.4.5. Intended treatment adherence

Analogue patient adherence was measured with three items [52] on which participants indicated their degree of agreement on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The three items were: "*I intend to follow my treatment plans*"; "*I have no intentions of following my treatment plans*" (reverse-scored item), and "*Following my treatment plan is not in my plans*" (M = 2.18, SD = 0.98, Cronbach's alpha = .92).

2.4.6. Perceived physician competence

How competent the physician was perceived by the participants was assessed with the four following items: "*How competent is this doctor?*", "*How confident is this doctor?*", "*How capable is this doctor?*" and "*How skillful is this doctor?*" [53]. Again, participants indicated their agreement on 5-point Likert scales (1 = not at all, 5 = extremely; M = 3.55, SD = 0.73, Cronbach's alpha = .80).

2.4.7. Perceived physician empathy

Analogue patients' perceptions of the physician's empathic concern and understanding was measured using a validated scale [54] with five items on which participants indicated their degree of agreement on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Items included: "*This doctor understands my emotions, feelings and concerns.*"; "*This doctor can view things from my perspective (see things as I see them).*" and "*This doctor is an understanding doctor.*" (M = 3.61, SD = 0.87, Cronbach's alpha = .86).

2.4.8. Patient preference for patient-centered physician communication

This was assessed using a scale that measures participants' preferences about how much they want their physician to show patient-centered communication, composed of a caring and sharing interaction style dimension [55]. The caring dimension can be defined as the extent to which participants prefer a physician to show empathy, warmth, and exploration of the patient's perspective whilst the sharing dimension measures to what extent the participants prefer the physician to share control over the consultation, to give information, and to negotiate the treatment decision [55]. Participants indicated their degree of agreement on a 5-point Likert scale (1 = do not agree at all, 5 = totally agree). Both dimensions had 9 items each. A sample item for the caring dimension is: "*A treatment cannot be successful if it is in direct conflict with the lifestyle or values of the patient*" and in the sharing dimension: "*Patients should be treated as partners, equal in power and status*". All items were averaged, and higher values indicate that the participant prefers a physician showing patient-centered communication, M = 2.55, SD = 0.35, Cronbach's alpha = .73.

2.4.9. Attention check

Participants were also asked (with two items) whether they correctly remembered how sensitive to stress the physician indicated to be, whether the physician suggested a CAT scan and a symptom diary for the patient's headaches using a five-point scale ranging from 1 (*not at all*) to 5 (*completely*). This was asked in order to filter participants and make sure they paid attention while reading the dialogue. Participants were excluded from the study if they failed to identify that in the scenario in which the physician self-disclosed, the physician mentioned that he/she was sensitive to stress. They were also excluded if they failed to identify (in the four scenarios) that the physician suggested a CAT scan and a symptom diary to the participants.

3. Results

Statistical analyses were performed using Stata 14. We calculated separate 2 (physician gender) by 2 (physician self-disclosure: present vs. absent) by 2 (participant gender) between-subjects ANOVAS for each of the dependent variables separately. Controlling for participant preference for physician participant-centered communication and for age did not affect the results which is why they are reported without those controls.

Results for *willingness to self-disclose* showed that there was neither a significant main effect of self-disclosure, $F(1,199) = 0.00$, $p = .99$, nor of participant gender ($F(1,199) = 0.09$, $p = .76$). However, there was a significant main effect of physician gender, $F(1,199) = 5.54$, $p = .01$, showing more willingness of the participant to self-disclose when confronted with a female physician ($M = 2.67$; $SD = 0.74$) than when confronted with a male physician ($M = 2.42$; $SD = 0.77$). Moreover, there was a significant interaction effect between physician gender and physician self-disclosure, $F(1,199) = 4.43$, $p = .03$. Planned contrast analysis, $t(110) = -3.07$, $p = .001$, confirmed our Hypothesis 1 (Fig. 1), stating that participants confronted with a female physician who self-disclosed are themselves more willing to self-disclose (self-disclosure reciprocity) $M = 2.77$; $SD = 0.75$ than participants confronted with a male physician who self-disclosed ($M = 2.33$; $SD = 0.75$). The remaining 2-way as well as the 3-way interactions were non-significant (all F's < 1.1, all p's > .29).

We also calculated additional contrast analyses that showed that female physicians who self-disclosed ($M = 2.77$; $SD = 0.75$)

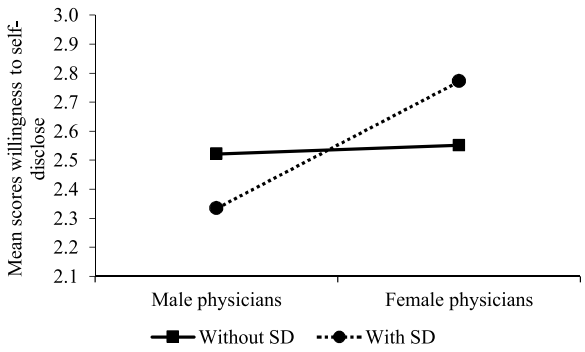

Fig. 1. Participant's Willingness to Self-Disclose According to Level of Physician Self-Disclosure and Physician Gender.

received marginally significantly more disclosure reciprocity than female physicians who do not self-disclose ($M = 2.55$; $SD = 0.72$): $t(103) = -1.53$, $p = .06$, and that male physicians who self-disclose ($M = 2.33$; $SD = 0.75$) received significantly less disclosure than male physicians who do not self-disclose ($M = 2.52$; $SD = 0.79$): $t(100) = 1.21$, $p = .04$.

Results for *perceived physician empathy* showed that there was a significant main effect of self-disclosure, $F(1,199) = 10.48$, $p = .001$, showing that physicians who self-disclosed were perceived as more empathic ($M = 3.79$; $SD = 0.84$) than physicians who did not self-disclose ($M = 3.40$; $SD = 0.86$). However, there was no significant physician gender main effect, $F(1,199) = 1.56$, $p = .21$, and no significant participant gender main effect, $F(1,199) = 1.11$, $p = .29$. Moreover, all 2-way, as well as the 3-way interactions were non-significant (all F's <1.70, all p's > .41). Our results thus did not support Hypothesis 2 which stated that female physicians who self-disclose are perceived as more empathic than male physicians who self-disclose.

With regard to *perceived physician competence*, there was no significant main effect of self-disclosure, $F(1,199) = 0.39$, $p = .53$, and none for physician gender, $F(1,199) = 1.33$, $p = .25$. The effect of participant gender was also non-significant, $F(1,199) = 1.65$, $p = .20$. All 2-way, as well as the 3-way interactions were non-significant (all F's <1.61, all p's > .20). Hypothesis 3 which stated that male physicians who self-disclose are perceived as more competent than female physicians who self-disclose was not confirmed.

Results relating to participant outcomes showed that for *trust in physician* ($F(1,199) = 0.02$, $p = .90$), *willingness to return to this physician* ($F(1,199) = 1.89$, $p = .17$), *participant satisfaction* ($F(1,199) = 0.08$, $p = .77$), and *intended treatment adherence* ($F(1,199) = 0.06$, $p = .80$), there was no significant main effect of self-disclosure. There was also no main effect for physician gender (all F's < 0.62, all p's > .56) and participant gender, only trust in physician had a significant main effect of participant gender, $F(1,199) = 3.30$, $p = .07$. For the remaining variables, there was no significant main effect of participant gender (all F's < 1.02, all p's > .65). All 2-way, as well as the 3-way interactions were non-significant (all F's < 1.23, all p's > .60).

In sum, Hypothesis 4 stating that male physicians who self-disclose will have participants with more positive consultation outcomes than female physicians who self-disclose was not confirmed.

4. Discussion and conclusion

4.1. Discussion

The aim of the current study was to investigate the role of physician gender and physician self-disclosure on how analogue patients would react to the physician (i.e., self-disclosure reciprocity) and how they would perceive the physician.

As predicted (Hypothesis 1), our results showed that participants show more self-disclosure reciprocity to female physicians who self-disclose compared to male physicians who self-disclose. This confirms results in the existing literature showing that women who self-disclose receive more self-disclosure in return [56]. The norm of reciprocity makes people give in return if they receive something. Self-disclosure can be seen as offering personal information and the reciprocity norm puts pressure on the receiver to self-disclose in return. Now, it seems self-disclosure reciprocity is more important towards women and in our case towards female physicians. When female physicians self-disclose, they behave in a way that is consistent with conventional gender-role norms, thus participants might be more willing to self-disclose with them. Previous research by Hall et al., [57] also found that female physicians received more medical information from patients than male physicians indicating that patients felt more comfortable discussing their medical issues with female physicians rather than with male physicians.

Our results suggest that using self-disclosure might be a very good way to obtain relevant patient information for female physicians. Self-disclosure of the patient in the medical consultation is important because it helps patients reveal information they would not otherwise share [58], leading to quicker and more precise diagnosis. Self-disclosure also keeps patients motivated to continue their treatment and helps the patient and the physician to develop a trusting relationship by adding credibility to the support the physician wants to offer his or her patient [58].

Male physician self-disclose has a rather negative effect on the patient in that it decreases the willingness of their participants to self-disclose. Maybe the fact that a male physician self-discloses is unexpected and clashes with conventional gender-roles. According to gender stereotypes, society expects men to be tough and they are discouraged to express their feelings publicly while women are expected to be more expressive thus, they behave according to gender stereotype when expressing their emotions and feelings publicly [34]. This could explain why male physicians' participants seem to be less willing to self-disclose with them when the physicians themselves self-disclose as compared to when they do not.

We also expected that female physicians who self-disclose are perceived as more empathic than male physicians (Hypothesis 2). Our results show that physicians who self-disclose are perceived as more empathic than physicians who do not self-disclose but there were no gender differences. The latter result is not surprising because self-disclosure has been described as a form of empathy [59] and as a way to communicate understanding to the other party one is interacting with [60]. We also expected that male physicians who self-disclosed would be perceived as more competent (Hypothesis 3) and would have better consultation outcomes (Hypothesis 4) than female physicians who self-disclosed. However, our results did not support these hypotheses. With respect to consultation outcomes, none of the variables measured (i.e. trust in physician, willingness to return to this physician, satisfaction with physician, intended treatment adherence and perceived physician competence) were affected by physician gender or level of self-disclosure of the physician. Therefore, similarly to the results found in our previous studies [18], physician gender and physician self-disclosure had no significant effect on participants' consultation outcomes (e.g. patient satisfaction or intended treatment adherence).

Apparently, the perception of physicians who self-disclose does not differ with respect to whether the self-disclosure comes from a female or a male physician (e.g., perceived empathy and competence, and expected consultation outcomes). Maybe self-

disclosure is not a dimension that patients use to infer physician's characteristics and anticipated outcomes. Why female physicians are not perceived as more empathic when they self-disclose than male physicians might be an effect of patients expecting empathy from both female and male physicians equally, meaning that for patients, self-disclosure does not activate the gender stereotypes in terms of cognition but only in terms of behavior (or behavioral intentions such as self-disclosure reciprocity). This might be due to implicit learned schemas, responding more openly to women who self-disclose than to men who self-disclose as has been demonstrated in the general population [62].

4.2. Limitations and future research

One weakness of this approach is the lack of generalizability of the results as analogue patients were university students and thus fairly uniform in terms of ethnic background, age, and educational level. Our analogue patients were young, mostly Caucasian and in good health, thus not representative. It is possible that there is more in-group self-disclosure reciprocity in that African-American patients might be more motivated to self-disclose after having received self-disclosure from an African-American doctor. More research is needed to replicate the findings in other conditions, other research methods and on more age and ethnic categories.

Also, vignette studies with an experimental design might be seen as more removed from medical practice than field studies. However, the experimental setting enables the researchers to look for causal relations and it controls for differences in female and male physician's frequency and type of self-disclosure. Therefore, our results complement the ones gained from observational studies. Moreover, the fact that the study was conducted on a computer might have hampered the realism of the situation for the analogue patients. Nevertheless, we think that this worked against us finding any results. We suspect therefore, that the results we report are rather an underestimation of the true effects.

Self-disclosure is complex in the sense that it has different characteristics that may affect the recipient's perception of the statements such as the depth of the disclosure, which is the level of intimacy of the disclosure (*I like country music* vs. *I went through depression a few years ago*), and the breadth, which refers to the amount of information exchanged (*1 statement in 15 min vs 5 statements in 15 min*) [62]. For this study, we used self-disclosure statements that could be perceived as not "deep" enough, in an effort for the conversation to be relatable to most students. Some students might have perceived the illnesses portrayed "*headache and belly pain*" as not severe enough -especially as it was a dialogue rather than a video-and thus might have not been emotionally engaged in the consultation. In order to emotionally engage students, future research could conduct this experiment with video vignettes rather than dialogues.

4.3. Conclusion

Our study shows that when female physicians self-disclose, this might be beneficial for the clinical relationship because it entails more self-disclosure from the part of the patient and more positive perception of the physician, which is important for diagnosis and treatment recommendations. For male physicians, self-disclosure has a rather negative impact on patients.

4.4. Practice implications

Our results underscore the importance of taking into account physician gender when training physicians in patient-centered communication because the same behavior stemming from female or male physicians, although indicative of empathy as a facet of patient-centered communication, can have different effects on patients. Female physicians should use self-disclosure to obtain more information from patients whereas male physicians should avoid self-disclosure; patients seem to clam up when they receive self-disclosure from male physicians.

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CRediT authorship contribution statement

Keou Kadji: Conceptualization, Methodology, Software, Investigation, Funding acquisition, Writing - original draft. **Marianne Schmid Mast:** Writing - review & editing, Visualization, Supervision, Validation.

Appendix A

Dialogue presented to the Analogue Patients

	With self-disclosure (Male physician)	Without self-disclosure (Male physician)
Doctor:	Hello, please come in. Sorry it took a bit of time to take you, my son called me and had an important matter he wanted to talk about. He could have called my wife but . . . you know how kids are (*laughing*).	Hello, please come in. Sorry it took a bit of time to take you, I had to take a phone call, and this took some time you know how it sometimes is (*laughing*).
Patient:	Yes, don't worry, I understand, and it did not take that long so it's fine.	Yes, don't worry, I understand, and it did not take that long so it's fine.
Doctor:	Great. So, what is bringing you in today?	Great. So, what is bringing you in today?
Patient:	I've have been having terrible headaches lately, as well as severe stomach pains.	I've have been having terrible headaches lately, as well as severe stomach pains.
Doctor:	What can you tell me about the headaches and stomach pains?	What can you tell me about the headaches and stomach pains?
Patient:	My headaches occur 2–3 times a week and stomach pains 3–4 times a week. Sometimes separately, sometimes simultaneously. They are both very painful and can go on for minutes or hours at a time.	My headaches occur 2–3 times a week and stomach pains 3–4 times a week. Sometimes separately, sometimes simultaneously. They are both very painful and can go on for minutes or hours at a time.
Doctor:	How would you describe the pain?	How would you describe the pain?
Patient:	They are both very sharp and the stomach pain prevents me from eating most of the time.	They are both very sharp and the stomach pain prevents me from eating most of the time.
Doctor:	How have the headaches affected your everyday life? For example: I remember a few weeks ago, I also had a bout of head and stomach pains and I had to stay off work for a few days. It was terrible. My wife had to take care of me the whole time and I can tell you she was not happy *(laughing)*.	How have the headaches affected your everyday life? For example: I remember a few weeks ago, I had a patient with a bout of head and stomach pains, and he had to stay off work for a few days. It was terrible. His wife had to take care of him the whole time and she was probably not very happy *(laughing)*.
Patient:	It's the same for me, I had to take a day off work. I cannot sleep and sometimes I cannot eat because of my stomach pains. I already lost 2kg in a week.	It's the same for me, I had to take a day off work. I cannot sleep and sometimes I cannot eat because of my stomach pains. I already lost 2kg in a week.
Doctor:	I think what is best for now is to try to relieve you from your pain as well as run several lab tests to rule out metabolic problems. We could go over the lab results	I think what is best for now is to try to relieve you from your pain as well as run several lab tests to rule out metabolic problems. We could go over the lab results

(*Continued*)

	With self-disclosure (Male physician)	Without self-disclosure (Male physician)
	together next time. What do you think about that?	together next time. What do you think about that?
Patient:	I agree with that.	I agree with that.
Doctor:	Very often the pain you described is associated with bad posture or eye strain like, for example, working for long periods of time at the computer. I always try to take breaks when I work on the computer for long periods. It is also important to consider all aspects of your daily life. Stress is often a trigger in the kind of stomach pain you described. Problems at home or at school or work might cause such headaches. I am personally very sensitive to stress. Do you know what I mean?	Very often the pain you described is associated with bad posture or eye strain like, for example, working for long periods of time at the computer. The general recommendation is to take breaks when working on the computer for long periods. It is also important to consider all aspects of your daily life. Stress is often a trigger in the kind of stomach pain you described. Problems at home or at school or work might cause such headaches. Many people are very sensitive to stress. Do you know what I mean?
Patient:	Yes. I completely understand.	Yes. I completely understand.
Doctor:	We can work together to get to the bottom of it. I imagine that if I were at your place, I'd be very frustrated.	We can work together to get to the bottom of it to avoid you getting frustrated.
Patient:	I just want to find out what is going on because I can't go on like this.	I just want to find out what is going on because I can't go on like this.
Doctor:	For your headaches, First, you can decide to wait and see if the symptoms resolve on their own. Waiting may save you the discomfort of unnecessary treatment. If the headaches do not resolve, however, important time could be lost in treating a problem that could worsen. Of course, only you can make this type of choice – it depends on what kind of person you are and what is most important to you. In my case for example, my headaches resolved after I got some rest. But again, everyone is different. For your stomach pains, depending on the results of the tests, I will suggest you a treatment. If it is indeed a stomach ulcer, it will likely be resolved in 8 weeks or so. What do you think makes sense for you regarding your headaches?	For your headaches, First, you can decide to wait and see if the symptoms resolve on their own. Waiting may save you the discomfort of unnecessary treatment. If the headaches do not resolve, however, important time could be lost in treating a problem that could worsen. Of course, only you can make this type of choice – it depends on what kind of person you are and what is most important to you. In some cases, the headaches resolved after getting some rest. But again, everyone is different. For your stomach pains, depending on the results of the tests, I will suggest you a treatment. If it is indeed a stomach ulcer, it will likely be resolved in 8 weeks or so. What do you think makes sense for you regarding your headaches?
Patient:	I would like to try something – but I am not really sure what	I would like to try something – but I am not really sure what
Doctor:	I could order more extensive tests to better know what is going on. A CAT scan can be done to rule out a cerebral hemorrhage. That is a way of checking that there is not any sort of bleeding in the brain. I usually prescribe it to my patients who are very worried and would like to rule out any serious conditions. I recommended the same for a close friend of mine. So, what do you think? Would you like to do more tests?	I could order more extensive tests to better know what is going on. A CAT scan can be done to rule out a cerebral hemorrhage. That is a way of checking that there is not any sort of bleeding in the brain. It is usually prescribed to patients who are very worried and would like to rule out any serious conditions. It is what is recommended. So, what do you think? Would you like to do more tests?
Patient:	I think just as a measure of safety I could do the test	I think just as a measure of safety I could do the test
Doctor:	Alright. And you could also monitor your behavior and try to identify triggers for the headache. A symptom diary can be useful to you in keeping track of the links between symptoms and behavior. it has been suggested to me when I had similar symptoms at some point, and I have benefited from it. It really helped me. Do you think you would be able to keep a symptom diary for the next two weeks?	Alright, and you could also monitor your behavior and try to identify triggers for the headache. A symptom diary can be useful to you in keeping track of the links between symptoms and behavior. It is a common suggestion to patients with similar symptoms and many benefited from it. It really helps. Do you think you would be able to keep a symptom diary for the next two weeks?
Patient:	Yes, I am willing to try it. I hope I will keep it up.	Yes, I am willing to try it. I hope I will keep it up.
Doctor:	Don't worry once you start it becomes a habit. But you could also take medication. It helps with the pain. It may take some time for us to work together to get just the right dosage. For some patients it takes a few days to find the right dosage, and for some it takes a few weeks. However, do not become too discouraged if the headaches continue during this period.	Don't worry once you start it becomes a habit. But you could also take medication. It helps with the pain. It may take some time for us to work together to get just the right dosage. For some patients it takes a few days to find the right dosage, and for some it takes a few weeks. However, do not become too discouraged if the headaches continue during this period.
Patient:	I would rather not try any medication and would like to stick to the CAT scan first.	I would rather not try any medication and would like to stick to the CAT scan first.
Doctor:	If you are happy with your decision, then I am happy too. It's important for me to share the decision when it comes to patients' health. So, is there anything else I can do for you today?	If you are happy with your decision, then we can proceed. It's important for patients to share the decision when it comes to their health. So, is there anything else I can do for you today?
Patient:	No, I am happy with proceeding this way.	No, I am happy with proceeding this way.
Doctor:	Ok, so this is a prescription for more test regarding your stomach pains. I will contact you tomorrow morning with the results. And for your headaches let's set a date for the CAT scan and see discuss the results in a few days ok? Take care until then,	Ok, so this is a prescription for more test regarding your stomach pains. I will contact you tomorrow morning with the results. And for your headaches let's set a date for the CAT scan and see discuss the results in a few days ok? Take care until then,
Patient:	Thank you, Goodbye	Thank you, Goodbye

Appendix B. Supplementary data

Supplementary material related to this article can be found, in the online version, at https://doi.org/10.1016/j.pec.2021.02.030.

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