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## Consultation Recording: What Is the Added Value for Patients Aged 50 Years and Over? A Systematic Review

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### ABSTRACT

This systematic review aimed to provide medical professionals with insight into beneficial and harmful effects of consultation recording for patients aged 50 years and over. This insight could enable medical professionals to decide on whether or not to promote consultation recording in their practice. The systematic literature search was performed in six databases; additional relevant articles were sought using the snowball method. Studies were included that investigated the value of consultation recording for patients aged 50 years and over. The selected studies were analyzed on affective cognitive outcomes, behavioral outcomes, and health outcomes. Twenty-five studies of both qualitative and quantitative design were included. Consultation recordings mainly improved patient satisfaction, recall, fulfillment of information needs, and decision-making. Both positive and negative effects were reported on anxiety. The recordings did not distinctly affect functional outcomes or quality of life. In conclusion, consultation recording positively influenced patients' affective cognitive and behavioral outcomes, and the negative effects of consultation recording were minor. Because of the positive effects of consultation replay, we recommend that doctors promote consultation recording among their patients of 50 years and over. However, more studies are necessary among older patients because this patient population is underrepresented in the current literature.

Doctor-patient communication is an essential element of good clinical practice (Ha & Longnecker, 2010). Adequate communication can positively affect patient satisfaction and can even improve health outcomes (Street, 2013). Despite the importance of effective communication, doctor-patient communication is often sub-optimal.

It has been shown that patients experience many difficulties in remembering the information given during their medical consultation (Kessels, 2003). Kessels showed in his 2003 review that patients immediately forget between 40% and 80% of the medical information conveyed by their doctor (Kessels, 2003). Recall and understanding of medical information is particularly poor among older people (Watson & McKinstry, 2009), which could be attributed to declining cognitive abilities and difficulties experienced in structuring information (Kessels, 2003; Williams, Haskard, & DiMatteo, 2007).

A commonly used tool to improve recall and understanding is consultation recording (Elwyn, Barr, & Grande, 2015). A survey in the United States has shown that more than one in four physicians ever recorded a consultation for patients' personal use and about one in five of the general public ever recorded a consultation (Barr et al., 2018; Elwyn et al., 2015). Most consultations are recorded in oncology settings (Barr

et al., 2018), presumably because of the emotional nature of these consultations.

Many physicians recognize the importance of consultation recording, but there are also concerns. Doctors worry that patients may encounter interpretation difficulties and express medico-legal concerns (van Bruinessen, Leegwater, & van Dulmen, 2017). In addition, between 3% and 15% of patients report to have ever covertly recorded their consultation, which can undermine the doctor-patient relationship (Tsulukidze, Grande, Thompson, Rudd, & Elwyn, 2015).

In order for doctors to embrace consultation recording, the value of recording for patients needs to be evaluated. Several previous reviews have investigated the effects of consultation recording (Pitkethly, MacGillivray, & Ryan, 2008; Rieger, Hack, Beaver, & Schofield, 2018; Tsulukidze, Durand, Barr, Mead, & Elwyn, 2014) and have shown that recordings increase patient satisfaction, recall, and understanding, and are useful to inform relatives. However, it is unclear whether consultation recording has similar effects on the patient group that experiences most difficulties in recalling and understanding information: older patients. This literature review aimed to provide medical professionals with insight into older patients' reported beneficial and harmful effects of consultation recording.

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## Method

### Inclusion and exclusion criteria

The inclusion and exclusion criteria of this review are listed in [Table 1](#). To be included, studies needed to evaluate the value of audio or video recording a doctor-patient interaction for patients aged 50 years and over. Only original studies published in peer-reviewed journals were included. For practical reasons, studies in languages other than English were excluded.

### Search strategy

The literature search included the terms “recording” and “elderly” along with “consultation” or synonyms for these terms. The full search strategy can be found in [Appendix A](#). The following databases were searched: Excerpta Medica Database (Embase), Medical Literature Analysis and Retrieval System Online (MEDLINE), Psychological Information Database (PsycINFO), Web of Science, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Google Scholar. In addition to the systematic search, the references of all relevant studies and reviews were checked for potential articles to include. Articles of all dates were included until November 2018.

### Selection and quality assessment

Endnote was used to structure references. First, the titles and abstracts of all articles were scanned. Potentially relevant titles and abstracts were then compared by two researchers. Second, the full text of relevant articles was assessed using the inclusion and exclusion criteria. If the full text of an article was not available, the corresponding author was emailed whenever possible; the full text was assessed for eligibility if the author responded within three weeks. After full-text screening, articles included by both researchers were compared again and potential disagreement was resolved by discussion.

We used the Cochrane Collaboration’s tool for assessing risk of bias for randomized studies (Higgins et al., 2011) and the Methodological Index for Non-Randomized Studies for non-randomized studies (Slim et al., 2003). The Critical Appraisal Skills Programme qualitative checklist was used to assess qualitative studies (Critical Appraisal Skills Programme, 2017). The quality of each study was

assessed by two researchers independently, after which the results were discussed. All studies were scored as being of either high or low quality. We did not use a predefined cutoff for the number of items to be scored as positive for a study to be of high quality, as this was not recommended by the quality-assessment tools. A high-quality study needed to have no significant methodological flaws. If too little information on the methodology was present in the article to determine the quality, a low-quality score was given.

### Data extraction and synthesis

The data were synthesized using a recently published framework by Lafata, Shay, and Winship (2017) (see [Figure 1](#)). This framework describes three ways in which doctor-patient communication can influence patient outcomes. The first indirect path leads to affective cognitive outcomes, for instance patient satisfaction, and then to health outcomes. The second indirect path leads to behavioral outcomes, for instance treatment adherence, and then to health outcomes. The final path leads directly to health outcomes, for instance quality of life.

Several sub-outcomes were considered within the three outcome measures, which all emerged from the included articles. These sub-outcomes were satisfaction, mood state, and recall and understanding for affective cognitive outcomes; sharing recording, future contacts and consultations, decision-making, and effect on recorded consultation for behavior outcomes; and symptoms, need for emergency help, sick leave, and quality of life for health-outcomes.

## Results

### Included studies

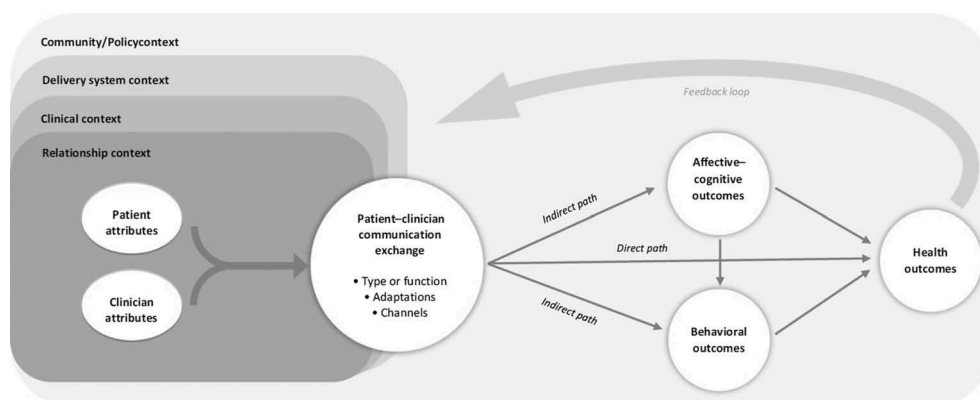
The literature search yielded 2208 unique references. After screening for titles and abstracts, 58 studies remained. For these records the full text was assessed, leaving 25 articles for the analysis of the literature review. The flow diagram and reasons for exclusion can be found in [Figure 2](#). The most common reason for exclusion was that the value of a general information tape was assessed rather than the value of a consultation tape.

[Table 2](#) provides an overview of the studies included in this review. The included studies were undertaken in Australia, Canada, Denmark, the Netherlands, Norway, Sweden, the United Kingdom, and the United States. Fourteen studies were randomized controlled trials (RCTs) and the other eleven were cohort studies or qualitative studies. Nineteen of the 25 studies were performed among cancer patients. Some studies investigated additional interventions besides consultation recording, including written information, general information tapes and question prompt lists. All studies used either a questionnaire or a (semi-) structured interview as an outcome measure. The timing of the outcome measurement ranged from a couple of days to a year after the intervention.

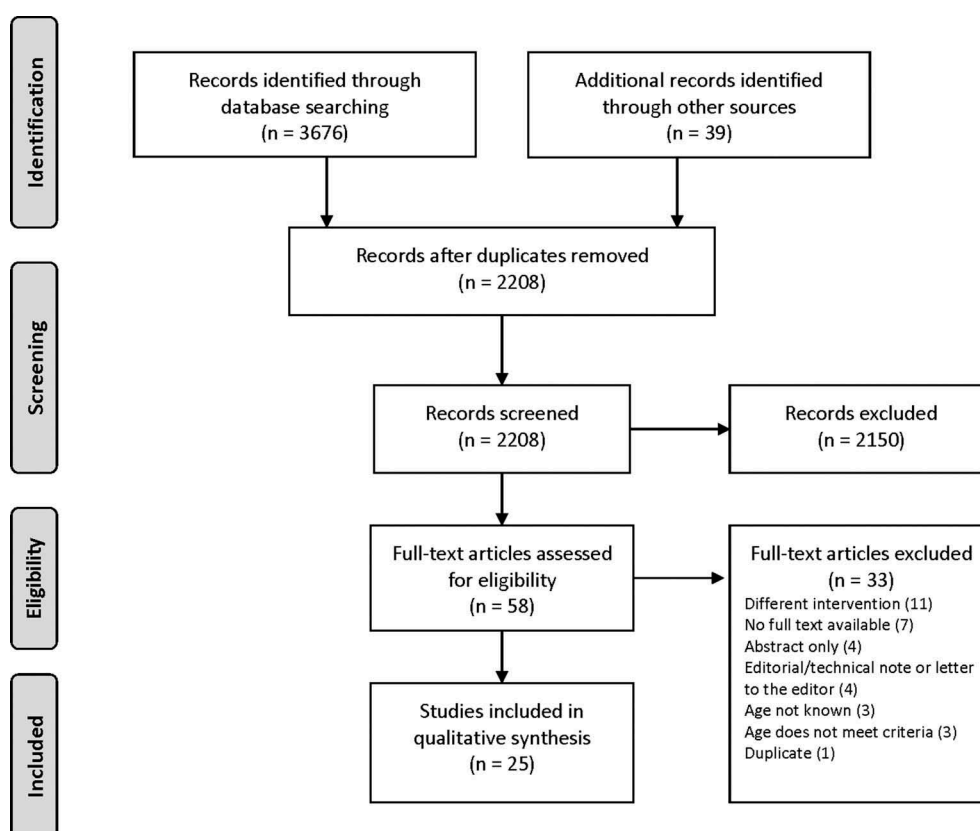
The results of the included studies will be described on the basis of the three outcomes of the conceptual framework:

**Table 1.** Inclusion and exclusion criteria.

Inclusion	Exclusion
Published full-text articles	Abstract only
Studies in English	Studies in languages other than English
Peer-reviewed studies	Systematic reviews/meta-analyses
Studies of all dates	Conference proceedings
Studies that investigate consultation recording among patients aged 50 years and over	Editorials, letters to the editor and opinion pieces
Studies that evaluate the beneficial and/or harmful effects of audio or video recording doctor-patient interactions for patients	Studies that evaluate the use of audio or video recordings for educational purposes
Studies focusing on patients’ perspectives on consultation recording	Studies that evaluate the role of general information tapes



**Figure 1.** Conceptual framework. "Patient-clinician communication model" by Lafata et al. (2017), licensed under CC BY 4.0, see <https://creativecommons.org/licenses/by/4.0/>.



**Figure 2.** PRISMA flow diagram of included studies.

affective cognitive outcomes, behavioral outcomes, and health outcomes (Lafata et al., 2017).<sup>1</sup> An overview of the results of the RCTs and comparative cohort studies is provided in Table 3 for affective cognitive outcomes, Table 4 for behavioral outcomes and Table 5 for health outcomes.

### **Affective cognitive outcomes**

#### **Satisfaction**

In general, patients were highly satisfied with the consultation recording. Participants of three studies (Hack, Pickles, Bultz, Ruether, & Degner, 2007; Hack et al., 2003; Hack, Ruether, Weir, Grenier, & Degner, 2013) rated the recording intervention

between 83 and 94 out of a maximum of 100. Four studies reported that most participants would recommend the interventions to others or would want future consultations to be recorded (Knox, Butow, Devine, & Tattersall, 2002; Newnham et al., 2015; Ong et al., 2000; Uitdehaag et al., 2012). In addition, two studies indicated that participants who did not receive a consultation tape felt disappointed (Hack et al., 1999; Leahy, Douglass, Barley, Jarman, & Cooper, 2005).

Besides the studies that described patient feedback, a number of RCTs also analyzed the effect of consultation recording on patient satisfaction. Four large RCTs found significant effects of the recording on different aspects of patient satisfaction. The RCT of Dunn et al. (1993) and Bruera, Pituskin, Calder,

**Table 2.** Descriptives of included studies.

First author, year	Study design (n <sup>a</sup> )	Quality	Setting	Intervention	Timing measurement	Descriptives
Ah-Fat et al. (1998)	Qualitative study (94)	Low	Oncology	Consultation tape	6 weeks–10 months	58 yrs [29–83] Men: 44 (47%) Group I: 55 yrs (10) Group II: 54 yrs (11) Men: 23 (18%) 62 yrs (10) Men: 36 (60%) <sup>b</sup> 55 yrs [26–77] Men: 19 (42%) <sup>b</sup> 52 yrs (unknown) Men: 27 (16%) <sup>b</sup>
Bergenmar et al. (2014)	RCT (130)	High	Oncology	Group I: consultation tape and written information Group II: written information	1 week after affirming participation in trial	
Bruera et al. (1999)	RCT (71)	High	Oncology	Group I: consultation tape and written information Group II: written information	Day 8	
Butt (1977)	Qualitative study (48)	Low	Outpatient Clinics	Consultation tape	Month 3–4	
Dunn et al. (1993)	RCT (142)	High	Oncology	Group I: consultation tape Group II: general tape Group III: no tape Group I: consultation tape Group II: no tape	Week 1–3	
Good et al. (2016)	Comparative cohort study (103)	High	Oncology	Group I: consultation tape Group II: no tape	Month 12	Group I: 64 yrs [50–74] Group II: 64 yrs [43–83] All men
Hack et al. (1999)	RCT-pilot (36)	Low	Oncology	Group I: taped, received no tape Group II: taped, received tape Group III: taped, choice to receive tape Group I: standard care Group II: taped, received no tape Group III: taped, received tape Group IV: taped, choice to receive tape Similar to Hack et al. (2003)	Before and after consultation and after week 6	Men: 67 yrs [51–79] Women: 52 yrs [34–77] Men: 18 (50%) 57 yrs (12) All women
Hack et al. (2003)	RCT (670)	High	Oncology	Consultation tape	Week 12	
Hack et al. (2007)	RCT (466)	High	Oncology	Consultation tape	Week 12	67 yrs (8) All men
Hack et al. (2013)	Qualitative study (229)	High	Oncology	Consultation tape	Day 2 and week 1	60 yrs [36–86] Men: 54 (24%) <sup>b</sup>
Haerem et al. (2000)	RCT (50)	Low	Cardiology	Group I: consultation tape Group II: no tape	Week 1, 8 and 52	Men: 53 yrs (unknown) Women: 57 yrs (unknown)
Hogbin and Fallowfield (1989)	Qualitative study (46)	Low	Oncology	Consultation tape	Whenever finished listening	Men: 38 (76%) 56 yrs [31–81]
Hogbin et al. (1992)	RCT (87)	Low	Oncology	Group I: consultation tape Group II: no tape	After consultation, 2–3 days pre-operatively and 6 weeks post-operatively	Men: 4 (9%) Group I: 58 yrs [39–82] Group II: 58 yrs [36–79]
Hyatt et al. (2018)	Qualitative study (18)	High	Oncology	Consultation tape and question prompt list	Week 2	All women 63 [39–78]
Johnson and Adelstein (1991)	Qualitative study (29)	Low	Oncology	Consultation tape	Week 2	Men: 11 (61%) 65 yrs [28–83]
Knox et al. (2002)	Prospective cohort study (52)	High	Oncology	Consultation tape followed by summary letter (after 2 weeks) Group I: consultation tape Group II: no tape	Week 2 and 4	Men: 19 (66%) 51 yrs [19–80] Men: 13 (25%) Group I: unknown [50–78] yrs Group II: unknown [30–72] yrs
Leahy et al. (2005)	Qualitative study (20)	Low	Cardiac Surgery	Group I: consultation tape Group II: no tape	Week 6	Men: 15 (79%) <sup>b</sup> 66 yrs [50–82] Men: 14 (61%)
Lipson-Smith et al. (2016)	Qualitative pilot study (23)	Low	Oncology	Pilot intervention including information sheet, question prompt list and consultation tape	Week 2	

(Continued)

**Table 2.** (Continued).

First author, year	Study design (n <sup>a</sup> )	Quality	Setting	Intervention	Timing measurement	Descriptives
Mishra et al. (2010)	RCT (84)	High	Cardiac Surgery	Group I: no tape Group II: general tape Group III: consultation tape	At hospital admission	Group I: 67 yrs [63–68] Group II: 67 yrs [64–71] Group III: 66 yrs [62–69] Men: 60 (71%) 70 yrs [23–91] Men: 13 (65%) Group I: 54 yrs [25–85] Group II: 53 yrs [15–93] Men: 37 (18%) I: 66 yrs [48–88] II: 69 yrs [49–82] Men: 43 (74%) Group I: 51 yrs [28–78] Group II: 51 yrs [16–80] Men: 40 (22%) Group I: 68 yrs [50–89] Group II: 62 yrs [42–77] Men: 12 (71%) <sup>b</sup> Group I: 61 yrs (15.5) Group II: 61 yrs (15.1) Group III: 62 yrs (15.0) Men: 1926 (57%) <sup>b</sup>
Newnham et al. (2015)	Qualitative-pilot study (20)	Low	Acute General Medicine	Discharge video with standardized script	Within 2 weeks	
Ong et al. (2000)	RCT (201)	High	Oncology	Group I: consultation tape Group II: no tape	Week 1 and month 3	
Stephens et al. (2008)	RCT (58)	High	Oncology	Group I: consultation tape Group II: no tape	Week 2	
Tattersall et al. (1994)	Cross-over RCT (182)	Low	Oncology	Group I: consultation tape followed by summary letter (after 7–10 days) Group II: summary letter followed by consultation tape (after 7–10 days) Group I: consultation tape Group II: no tape	Day 10 and 20	
Uitdehaag et al. (2012)	RCT-pilot (21)	High	Oncology	Group I: standard care Group II: question prompt list and consultation tape Group III: consultation tape	Week 1 and month 1	
Wolderslund et al. (2017)	RCT (9143, 5834 received intervention)	High	Outpatient Clinics	Group I: standard care Group II: question prompt list and consultation tape Group III: consultation tape	13–16 days	

Age is shown as mean or median and (SD) or [range]. Sex is shown as number (percentage of sample at baseline). <sup>a</sup>Number randomized for RCTs and number providing informed consent for qualitative studies. <sup>b</sup>Percentage of participants for whom results were shown.



**Table 3.** Affective cognitive outcomes: the effect of comparative studies.

Outcome	Study	Quality
<b>Satisfaction</b>		
Significantly higher in intervention group		
General satisfaction	Ong et al. (2000) <sup>a</sup>	High
Satisfaction with consultation	Bruera et al. (1999)	High
	Dunn et al. (1993) <sup>b</sup>	High
Satisfaction with treatment and physician	Wolderslund et al. (2017) <sup>c</sup>	High
Satisfaction with interpersonal aspects	Ong et al. (2000) <sup>a</sup>	High
Not significantly different		
Satisfaction with consultation	Ong et al. (2000) <sup>d</sup>	High
Satisfaction with communication	Hack et al. (2003)	High
	Hack et al. (2007)	High
	Ong et al. (2000)	High
<b>Depression</b>		
Not significantly different		
	Hogbin et al. (1992)	Low
	Mishra et al. (2010) <sup>e</sup>	High
	Stephens et al. (2008)	High
	Tattersall et al. (1994)	Low
<b>Anxiety</b>		
Not significantly different		
	Hogbin et al. (1992)	Low
	Mishra et al. (2010) <sup>e</sup>	High
	Stephens et al. (2008)	High
	Tattersall et al. (1994)	Low
<b>Psychological adjustment</b>		
Not significantly different		
	Dunn et al. (1993)	High
	Hack et al. (2003)	High
	Hack et al. (2007)	High
<b>Control or management of health problems</b>		
Significantly higher in intervention group	Mishra et al. (2010)	High
Not significantly different		
	Wolderslund et al. (2017) <sup>c</sup>	High
<b>Recall or knowledge</b>		
Significantly higher in intervention group		
Subjective recall	Tattersall et al. (1994) <sup>f</sup>	Low
Objective recall	Bruera et al. (1999)	High
	Hack et al. (1999) <sup>g</sup>	Low
	Mishra et al. (2010)	High
	Ong et al. (2000)	High
	Stephens et al. (2008)	High
Not significantly different		
Objective recall		
	Bergenmar et al. (2014)	High
	Dunn et al. (1993)	High
	Haerem et al. (2000)	Low
	Tattersall et al. (1994) <sup>f</sup>	Low
<b>Fulfillment information needs</b>		
Significantly higher in intervention group		
	Hack et al. (2003) <sup>h</sup>	High
	Hack et al. (2007) <sup>i</sup>	High
	Wolderslund et al. (2017) <sup>c,j</sup>	High
<b>Perceived understanding</b>		
Significantly higher in intervention group		
	Hogbin et al. (1992) <sup>k</sup>	Low
Not significantly different		
	Bergenmar et al. (2014)	High
	Bruera et al. (1999)	High

<sup>a</sup>Significantly different after one week but not after three months. <sup>b</sup>Increased linearly from no tape to generalized tape to consultation tape. <sup>c</sup>Results from intention-to-treat analysis. <sup>d</sup>Significant in entire sample but not when including only patients aged 55 years and over. <sup>e</sup>Consultation tape group scored significantly better than general tape group. <sup>f</sup>Difference between consultation tape group and consultation summary group. <sup>g</sup>Result only reported for the subgroup of men: patients who received the tape by choice recalled most. <sup>h</sup>Effect only observed for information on side effects. <sup>i</sup>Effect only observed for information on side effects, treatment alternatives and overall information. <sup>j</sup>Only test results and treatment options survived correction for multiple testing. <sup>k</sup>Perceived understanding increased significantly in intervention group but not in control group, no between-group significance described.

Neumann, and Hanson (1999) showed that satisfaction with the consultation was higher in the consultation recording group compared to the control group or a general tape group. Dunn et al. (1993) also showed that satisfaction with the tape itself was higher in the consultation tape group than the generic tape

group. Moreover, Ong et al. (2000) found a significantly higher general satisfaction and satisfaction with interpersonal aspects in the intervention group compared to the control group after a week, but not after a three months. In their study, satisfaction with the communication did not differ between the groups and satisfaction with the consultation only increased significantly in patients under 55 years of age. Finally, the study by Wolderslund, Kofoed, Holst, Axboe, and Ammentorp (2017) showed that patients who received a consultation tape rated their satisfaction with the treatment and confidence in and relationship with the physician higher than the control group. Despite the effects on satisfaction shown in these RCTs, the RCTs by Hack et al. (2003, 2007) did not show a significant difference in satisfaction with the communication.

Consultation tapes were considered complementary to summary letters from the treating physician (Butt, 1977; Knox et al., 2002; Tattersall, Butow, Griffin, & Dunn, 1994). Most patients preferred receiving both a consultation tape and a summary letter. Reasons for preferring a tape were that it was more reassuring and personal, and not restricted to what the doctor thought was important. On the other hand, reasons for preferring a letter were that it was easier to share, because it was less personal, and easier to file.

### Mood state

Mood state was defined as depression, anxiety, adjustment to illness and perceived control in the studies included in this review. Four studies reported on the effect of recordings on depression. None of these studies found a difference in depression scores in the intervention group compared to the control group (Hogbin, Jenkins, & Parkin, 1992; Mishra, Mathias, Millar, Nagrajan, & Murday, 2010; Stephens et al., 2008; Tattersall et al., 1994). Interestingly, the RCT by Mishra et al. (2010) showed that the consultation tape group scored significantly better on depression than the general tape group.

Studies have described different effects of consultation recording on anxiety; it has been hypothesized that a consultation tape is comforting for some, while distressing for others. Four RCTs did not find a significant difference in anxiety levels between the consultation tape group and control group (Hogbin et al., 1992; Mishra et al., 2010; Stephens et al., 2008; Tattersall et al., 1994). Similar to the findings for depression, the RCT by Mishra et al. (2010) found significantly improved anxiety scores in the audiotape group compared to the general tape group. Patient-feedback showed that not listening to the consultation recording was often anxiety-related. Nevertheless, the listening itself was not distressing for most, but was even encouraging.

Other relevant aspects considering the patient's mood state are adjustment to illness and perceived control. Three RCTs of Dunn et al. (1993), Hack et al. (2003, 2007) reported that psychological adjustment was not significantly better in the intervention group than in the control group. On the contrary, a qualitative study by Ah-Fat, Sharma, and Damato (1998) indicated that the consultation tape helped patients to adjust emotionally and psychologically to their illness. Additionally, the RCT conducted by Mishra et al. (2010) showed that the consultation tape group experienced significantly more control over their health than the group that received a generic tape or no

tape. However, Wolderslund et al. (2017) did not find a similar effect on the ability to manage health problems.

### Recall and understanding

Recall of the consultation was measured in various ways and at different times. Often a general information test was used, although some studies measured recall based on participant-specific questions. Nine RCTs reported on objectively measured recall, of which four reported significant better recall in the consultation recording group compared to the control group (Bruera et al., 1999; Mishra et al., 2010; Ong et al., 2000; Stephens et al., 2008). Hack et al. (1999) reported only results for the subgroup of men and showed that patients who had the choice to receive a consultation tape recalled more than those who received the audiotape without choice or those who did not receive a tape. Dunn et al. (1993), Bergenmar, Johansson, Wilking, Hatschek, and Brandberg (2014), Haerem, Rønning, and Leidal (2000), and Tattersall et al. (1994) did not find a significant difference in objectively measured recall when comparing patients receiving a consultation tape to those not receiving a tape or written information only. However, Tattersall et al. (1994) indicated that patients scored the tape significantly more effective in reminding them of what the doctor said. Patient feedback of most studies showed predominantly positive effects of the tape on recall.

Two studies by Hack et al. (2003, 2007) reported that patients' perception of having been informed was significantly greater in the intervention group than in the control group. Hack et al. (2003) showed this only for information on side effects and Hack et al. (2007) for information on side effects, treatment alternatives and overall information. Additionally, Wolderslund et al. (2017) described that patients who received an audiotape had greater fulfillment of their information needs than the control group. Consultation tapes were deemed most useful for consultations in which new information or important issues were discussed and when the ability to take in information was impaired (Hyatt et al., 2018; Lipson-Smith et al., 2016).

Patients' perceived understanding was not reported to be significantly different by two RCTs (Bergenmar et al., 2014; Bruera et al., 1999). On the contrary, the RCT conducted by Hogbin et al. (1992) found a significant increase in understanding after approximately two weeks in the group that received an audio recording, but did not find this effect in the control group. Patient feedback indicated that the recording helped to clarify possible ambiguities, for instance about medical terminology; to encourage deeper reflection; to process information; to understand the condition; and to come up with new questions. Two studies reported that in some cases the recordings led to more uncertainties or unanswered questions (Bergenmar et al., 2014; Wolderslund et al., 2017).

### Behavioral outcomes

Most studies indicated that a great number of participants listened to the consultation tapes. Often, consultations were replayed by 80% or more. The average listening frequency ranged between once and four times. In general, patients more often listened to part of the tape than to the whole tape.

**Table 4.** Behavioral outcomes: the effect of comparative studies.

Outcome	Study	Quality
Ability to discuss illness with relatives		
Not significantly different	Bruera et al. (1999) Uitdehaag et al. (2012)	High High
Number of general practitioner visits		
Significantly lower in intervention group	Hogbin et al. (1992)	Low
Seeking further information		
Significantly lower in intervention group	Wolderslund et al. (2017) <sup>a,b</sup>	High
Not significantly different	Hogbin et al. (1992)	Low
Decision-making		
Significantly better in intervention group		
Involvement in decision-making	Wolderslund et al. (2017) <sup>a,b</sup>	High
Decision regret	Good et al. (2016)	High

<sup>a</sup>Results from intention-to-treat analysis. <sup>b</sup>Correction for multiple testing results in loss of significance.

### Sharing recording

Consultation recordings were frequently shared with close family members. Some patients also shared the consultation recording with another healthcare provider. Patient feedback indicated that tapes eased communication with relatives by giving more accurate information; helping family to gain more knowledge of the disease; facilitating discussion about the illness; and reducing the need to repeatedly explain what was said during the consultation. The RCTs by Bruera et al. (1999) and Uitdehaag et al. (2012), however, did not find a significant difference in the ability to discuss illness with friends and family in the consultation recording group compared to the control group.

### Future contacts and consultations

Several studies reported that patients were more actively involved in following consultations, were better informed, or needed less repetition of previously provided information, saving time in subsequent consultations. The RCT by Wolderslund et al. (2017) showed that the number of contacts with the clinic was significantly lower in the consultation recording group compared to the control group, although this difference was not significant after correction for multiple testing. In addition, Hogbin et al. (1992) showed that the number of visits to the general practitioner was significantly lower in the intervention group, but the control group did not make more attempts to seek further information or visit the nurse.

### Decision-making

Patients in the intervention group of the RCT of Wolderslund et al. (2017) rated their involvement in decision-making higher than patient in the control group, although this effect was no longer significant after correction for multiple testing. In addition, a comparative cohort study by Good et al. (2016) showed that the mean decision regret score was significantly lower in the consultation recording group than in the control group. Patient feedback corroborated that recordings were useful for decision-making.



### Effect on recorded consultation

A few studies illustrated that recordings altered the course of the consultation. Patients in the study of Lipson-Smith et al. (2016) and Hyatt et al. (2018) thought recordings made the doctor more attentive or could encourage the doctor to communicate more effectively. Similarly, physicians in the studies of Hogbin and Fallowfield (1989) and Johnson and Adelstein (1991) reported that the recorded consultations were more explicit. The two studies by Knox et al. (2002) and Ong et al. (2000) showed that the majority of the patients did not notice the recording during the consultation. In addition, few patients thought the tape limited discussion or felt discomfort because of it (Butt, 1977; Johnson & Adelstein, 1991; Knox et al., 2002).

### Health outcomes

The studies by Good et al. (2016) and Hogbin et al. (1992) showed some indications of less physical symptoms in the consultation recording group compared to the control group, although the difference was only significant for bowel-related symptoms in the study of Good et al. (2016). The study of Haerem et al. (2000) revealed that the tape group needed significantly less emergency help, was less often re-admitted and included less people on sick leave than the control group. No studies found a significant effect on functional outcomes or quality of life (Good et al., 2016; Hack et al., 2003, 2007; Ong et al., 2000; Uitdehaag et al., 2012). The reported results on health outcomes must be interpreted in the light of the limited available evidence on these outcomes and the possibility of a placebo effect.

### Consultation recording for older patients

We hypothesized that older patients would benefit most from consultation recording. To study whether there is an increased effect of consult recording in older patients, we compared the included studies which had a mean participant age above 65 years with the other included studies. Seven studies had a mean participant age of 65 years and over: four high-quality RCTs and three low-quality qualitative studies (Hack et al., 2007; Johnson & Adelstein, 1991; Lipson-Smith et al., 2016; Mishra et al., 2010; Newnham et al., 2015; Stephens et al., 2008; Uitdehaag et al., 2012).

**Table 5.** Health outcomes: the effect of comparative studies.

Outcome	Study	Quality
Symptoms		
Not significantly different	Good et al. (2016) <sup>a</sup>	High
	Hogbin et al. (1992)	Low
Emergency help, re-admission and sick leave		
Significantly lower in intervention group	Haerem et al. (2000)	Low
Functional status or quality of life		
Not significantly different	Good et al. (2016)	High
	Hack et al. (2003)	High
	Hack et al. (2007)	High
	Ong et al. (2000)	High
	Uitdehaag et al. (2012)	High

<sup>a</sup>The tape group only scored significantly better on bowel-related symptoms than the control group.

Consultation recording did not show an evidently greater beneficial effect in this patient group. Nevertheless, the effect of recording on recall seemed more profound in studies considering older patients, whereas there was less support for an effect on satisfaction. This finding is consistent with the observation of Ong et al. (2000) that access to tapes seems more helpful in enhancing recall among older than among younger patients. Because of the very small number of studies considering the effect of consultation recording among patients aged 65 years and over, this conclusion must be interpreted with caution.

### Discussion

This literature review aimed to identify the beneficial and harmful effects of consultation recording for patients of 50 years and over. We have shown that recordings are mainly beneficial for patients and positively influence affective cognitive and behavioral outcomes, which are described as the two indirect paths by Lafata et al. (2017). There is little evidence for a direct effect of consultation recording on health outcomes.

The main results of this review are consistent with previous reviews among other patient populations (Pitkethly et al., 2008; Rieger et al., 2018; Tsulukidze et al., 2014; van der Meulen, Jansen, van Dulmen, Bensing, & van Weert, 2008; Watson & McKinstry, 2009). Similar to previous reviews, we have shown that the primary value of consultation recording is to increase patient satisfaction and recall. The value of consultation recording for older patients did not seem to differ much from the value for other patient populations, even though we found indications of a larger effect on recall and possibly a smaller effect on satisfaction in older patients.

The effects of consultation recording shown by the studies included in this review might differ from the effects of consultation recording in clinical practice. Patients in the studies included in this review were all provided with a consultation tape, whilst currently patients often bring their own device to a record consultation (Barr et al., 2018). This difference in recording approach could affect the patients' reported outcomes of consultation recording because patients who take the initiative to record their consultation might be more inclined to listen to the recording and might also rate the value of recordings higher.

We have shown that recordings are mainly beneficial for older patients. However, the value of consultation recording must outweigh the concerns of health professionals in order to successfully implement consultation recording in clinical practice (McConnell, Butow, & Tattersall, 1999; Stockler, Butow, & Tattersall, 1993; van Bruinessen et al., 2017). Physicians worry that consultation recording impairs the open discussion and undermines the doctor-patient relationship, and that patients may encounter interpretation difficulties when listening to the recording. In our review, we found that very few patients thought the tape limited discussion and that some studies even reported a positive influence on the doctor's appreciation. In addition, studies did not report that patients encountered interpretation difficulties, but even showed that patients were better informed. Hence, these

concerns should not be a reason to withhold patients a recording. Another concern among doctors, presumably the most important concern, is the issue of privacy and legislation. Our review has not focussed on these concerns of doctors, but the literature review of Rieger et al. (2018) has provided useful recommendations to deal with medico-legal concerns. These recommendations could help to successfully implement consultation recording in clinical practice.

Three aspects of our review warrant further consideration. First, 19 of the 25 included studies involved exclusively cancer patients, which limits the generalizability of our findings to other consultation types. Second, we included all studies with an average participant age above 50 years, whereas we aimed to study the value of consultation recording for older patients. Preferably, we would have included only studies with a higher mean participant age, however, this was impossible given the very small number of studies performed among this patient group. Third, the included studies were very diverse in timing and measurement of the outcomes, which made data pooling impossible. Therefore, we provided an overview of the literature by structuring the findings of RCTs and comparative cohort studies based on statistical significance. Although this method clearly shows the available evidence and current gaps in knowledge, this focus on significance does not inform about effect sizes and the dichotomization might misrepresent results.

Besides the limitations of this review, our work also has several important strengths. A strength of our methodology is that we included studies with different designs and that we did not exclude studies because of low quality. This choice made it possible to gain a thorough insight into all beneficial and harmful effects of recordings for patients. Most low-quality studies in this review were qualitative studies with a lack of information on the methodology, which does not mean those studies were not conducted properly. Another strength of this review is the open approach of data extraction: the three categories of Lafata et al. (2017) were used as a directive for data analysis and smaller themes emerged from the included studies.

This review has provided insight into currently known effects of consultation recording for older patients and has indicated areas that lack evidence in the existing literature. Additional research is required to investigate other patient populations than cancer patients. There is abundant scope for further progress in determining the effect of consultation recording among older patients because this patient group is underrepresented in the current literature, even though this patient population might benefit most from consultation recording.

## Conclusion

This review has shown that consultation recording is an important and easy-to-use information tool for older patients. Recordings can positively influence patients' affective cognitive and behavioral outcomes. The reported negative effects of recordings are minor and predominantly related to anxiety.

Further studies are warranted to explore the specific value of consultation recording for older patients.

## Note

1. A detailed table of the descriptives and results of all included studies is available upon request.

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## Appendix A: Search strategy

*Embase.com: 1066*

('recording'/exp OR (recording\* OR ((audio OR video) NEXT/1 (record\* OR consult\*))) OR videorecord\* OR audiorecord\* OR ((audio OR video OR information OR record\*) NEAR/3 (tape\*)) OR audiotap\* OR videotap\* OR ((consult) NEAR/3 (replay\*)):ab,ti) AND ('aged'/exp OR 'geriatric patient'/de OR 'geriatrics'/de OR (aged OR elder\* OR old\* OR ((65 OR 70 OR 75 OR 80 OR 85 OR 90) NEAR/1 (year\* OR yr OR yrs)) OR geriatr\*):ab,ti) AND ('consultation'/de OR (consult OR consults OR consultat\*):ab,ti)

*Medline Epub (Ovid): 975*

(exp "Tape Recording"/OR (recording\* OR ((audio OR video) ADJ1 (record\* OR consult\*))) OR videorecord\* OR audiorecord\* OR ((audio OR video OR information OR record\*) ADJ3 (tape\*)) OR audiotap\* OR videotap\* OR ((consult) ADJ3 (replay\*)):ab,ti.) AND (exp "Aged"/OR "Geriatrics"/OR (aged OR elder\* OR old\* OR ((65 OR 70 OR 75 OR 80 OR 85 OR 90) ADJ1 (year\* OR yr OR yrs)) OR geriatr\*):ab,ti.) AND ("Referral and Consultation"/OR (consult OR consults OR consultat\*):ab,ti.)

*Psycinfo (Ovid): 138*

("Audiotapes"/OR "Videotapes"/OR "digital video"/OR (recording\* OR ((audio OR video) ADJ1 (record\* OR consult\*))) OR videorecord\* OR audiorecord\* OR ((audio OR video OR information OR record\*) ADJ3

(tape\*)) OR audiotap\* OR videotap\* OR ((consult) ADJ3 (replay\*)):ab,ti.) AND (exp "Aged (Attitudes Toward)"/OR "Geriatrics"/OR (aged OR elder\* OR old\* OR ((65 OR 70 OR 75 OR 80 OR 85 OR 90) ADJ1 (year\* OR yr OR yrs)) OR geriatr\*):ab,ti.) AND ("Professional Consultation"/OR (consult OR consults OR consultat\*):ab,ti.)

*Cinahl (EBSCO): 667*

(MH "Audiorecording" OR MH "Videorecording" OR TX (recording\* OR ((audio OR video) N1 (record\* OR consult\*))) OR videorecord\* OR audiorecord\* OR ((audio OR video OR information OR record\*) N2 (tape\*)) OR audiotap\* OR videotap\* OR ((consult) N2 (replay\*))) AND (MH "Aged+" OR MH "Geriatrics" OR (aged OR elder\* OR old\* OR ((65 OR 70 OR 75 OR 80 OR 85 OR 90) N1 (year\* OR yr OR yrs)) OR geriatr\*)) AND (MH "Referral and Consultation" OR (consult OR consults OR consultat\*))

*Web of Science: 484*

TS=(((recording\* OR ((audio OR video) NEAR/1 (record\* OR consult\*)) OR videorecord\* OR audiorecord\* OR ((audio OR video OR information OR record\*) NEAR/2 (tape\*)) OR audiotap\* OR videotap\* OR ((consult) NEAR/2 (replay\*))) AND ((aged OR elder\* OR old\* OR ((65 OR 70 OR 75 OR 80 OR 85 OR 90) NEAR/1 (year\* OR yr OR yrs)) OR geriatr\*)) AND ((consult OR consults OR consultat\*)))

*Google Scholar: 200 (top relevant refs)*

"consult replay"|recording|audio|video recording|tapes|audiotapes|videorecording elderly|aged|old|geriatric consultation|consult