Interventions to improve recall of medical information in cancer patients: a systematic review of the literature

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ABSTRACT

This systematic review investigates which interventions are effective to improve recall of medical information in cancer patients. A literature research was done in PubMed, PsychINFO, CINAHL and Cochrane Library, following the guidelines of the Cochrane Collaboration. The methodological quality of selected studies was assessed independently by two reviewers. The results were synthesized with a Best Evidence Synthesis. Of initially 5173 found publications, 10 met all selection criteria. The results indicate that an audiotape of the patients' own consultation has added value upon oral information only. However, providing patients with a general audiotape does not improve recall of information and might even inhibit patients' recall. Furthermore, there is scientific evidence, although limited, that the use of a question prompt sheet (QPS) has a positive effect on recall of information, provided that the physician actively endorses this sheet. No evidence was found for an effect of providing patients with a summary letter of the consultation on recall, although research on this subject is scarce.

In conclusion, the review suggests that interventions that are tailored to the individual cancer patient, such as an audiotape of the consultation or a QPS, are most effective. Further research needs to be done to establish robust results.

INTRODUCTION

One of health professionals' major tasks is to inform patients about the diagnosis, prognosis, treatment and side effects of treatment. The goal of providing such information is to prepare patients for their treatment, to increase adherence to therapy and abilities to cope with the illness and to promote recovery. Patients must understand and be able to recall medical information because accurate knowledge is likely to improve outcome [1,2] in terms of better compliance [2,3], higher patient satisfaction [2], more adequate disease management and decreased anxiety [4,5]. Therefore, it is important to know what promotes recall of medical information by patients.

Recall in historical perspective

Studies on recall of medical information were conducted as early as the seventies and eighties.
Anderson [6], for example, showed that patients wrongly remembered more than half of the medical information given. Evidence regarding recall of information among various groups of patients was

summarized by Ley [7,8]. Heart surgery patients could not reproduce 71% of the received information. For rheumatic patients, this percentage varied between 52 and 69%. Outpatients with cancer forgot 31% of the received written information Ley [8] distinguished communication techniques that might positively influence recall, e.g. simplification, explicit categorization, repetition and the use of specific rather than general recommendations.

Kessels [2] presented the results of more recent research on recall of information. His overview showed that 40–80% of the medical information presented by health-care professionals was forgotten immediately by patients. Kessels [2] explained this in terms of the use of difficult medical terminology, factors related to the patient, such as low education and mode of information presentation.

Recall and cancer

During the last decades, a shift was observed from examining factors related to recall to research into the effectiveness of interventions aiming to improve recall of information. The underlying assumption is that the provision of additional educational materials, complementary to oral information, might result in increased recall scores. Cancer patients need to recall important information about their disease and treatment to be able to deal with the illness and side effects at home. It is important that health-care professionals have knowledge about state-of-the-art methods to effectively educate these patients. To our knowledge, no recent review studied the effectiveness of different interventions on cancer patients' recall of information. Therefore, a review study was set up to answer the following question:

What kinds of interventions are effective to improve recall of medical information provided to cancer patients?

METHODS

This review followed the guidelines of the Cochrane Collaboration and summarizes the existing evidence about interventions in cancer care that could improve patients' recall of medical information.

Recall was defined as the ability to reproduce the information provided about cancer and its treatment accurately and in detail.

Inclusion criteria

A study was included in the review if (a) it concerned a randomized controlled trial (RCT), a controlled clinical trial (CCT) or a randomized trial (RT), (b) the study was published in Dutch or English, (c) the study population consisted of patients with cancer who were given information about their diagnosis or treatment, (d) the population of professionals consisted of doctors and/or nurses working in cancer care, (e) one of the outcome measures was recall of information.

According to Michie et al. [9] recall is only measured appropriately when it is compared with the information that was actually given. Therefore, (f) only studies that related the patients' reproduction of information to the information provided (e.g. analyzed against an audiotape of the consultation) were included. Furthermore, (g) studies had to be published between 1990 and January 2007.

Search method

A computerized literature search was conducted to find intervention studies that fulfilled all seven inclusion criteria. Four databases were searched: PubMed, PsychINFO, CINAHL and The Cochrane Library. The computerized search was build upon the following components: (a) the search strategy for RTs (RCT, CCT, RT) and (b) the search strategy for the identification of studies involving cancer patients and recall of information using the following keywords: (cancer OR neoplasms) AND patient AND (information OR patient education) AND (recall OR retention OR knowledge). Additionally, the reference lists of all relevant studies and reviews were scanned for potential articles (snowball method).

Selection method

A first selection for inclusion was performed by the first author (N. vd M.) based on titles and abstracts. Studies that did not meet one of the seven inclusion criteria were excluded from the review. If a study seemed to meet the inclusion criteria or in case of doubt, the full article was obtained. On the basis of the full articles two reviewers (N. vd M., J. v W.) independently checked whether the selected studies satisfied all seven criteria. Disagreements were resolved by discussion and if agreement could not be achieved a third reviewer (J. J.) was consulted.

Assessment of methodological quality

The methodological quality of the RCT's and CCT's was independently assessed by two reviewers (N. vd M. and J. J.) using the list from the Cochrane Collaboration Back Review Group by Van Tulder et al. [10] (see Appendix A). The list consists of 11 criteria for internal validity, namely three criteria regarding selection bias (a–c), four criteria for performance bias (d,e,g,h), two criteria regarding attrition bias (i,k) and two criteria for detection bias (f,j). All criteria were scored as 'yes', 'no' or 'unclear'. All unclear scores were later rated as 'no'. To be rated as of sufficient quality, six out of 11 criteria had to be met. Consensus was used to resolve disagreements and if disagreement or indistinctness persisted a third reviewer (J. v W.) was consulted.

Data extraction

Two reviewers (N. vd M., J. v W.) independently documented the following characteristics of each included study:

1. Study design.
2. Participants: inclusion criteria, number of patients, sex, age, type of cancer and severity of the disease, inpatients/outpatients.
3. Intervention method: type of intervention in the experimental condition(s), type of intervention in the control conditions(s).
4. Outcome measures/instruments (recall of information): instruments used, timing of measurements, number of participants who completed the study in the experimental and control conditions, mean scores for experimental and control conditions, standard deviations in experimental and control conditions.
5. A short description of the results.

Data synthesis

Owing to diversity in the features of the interventions and the methods used to measure outcomes on recall of information, it was not possible to pool the data. Therefore a 'Best Evidence Synthesis' was conducted (see Table 1) based on Van Tulder et al.

[11] and adapted by Steultjens et al. [12].

The Best Evidence Synthesis was conducted by attributing various levels of evidence to the effectiveness of the interventions. The synthesis takes into account the design, the methodological quality and the outcomes of the studies.

Sensitivity analysis

A sensitivity analysis was performed to identify how sensitive the results of the Best Evidence Synthesis are to changes in the way it was conducted. The Best Evidence Synthesis was repeated in two different ways, using the following principles:

- Low-quality (LQ) studies were excluded.
- Studies were rated 'high–quality' (HQ) if at least four (instead of six) criteria of internal validity were met.

The results of the altered syntheses were then compared with those of the Best Evidence Synthesis, and the sensitivity of the method was described.

RESULTS

Included studies

[TABLE 1]

Application of the search strategy to the specified databases resulted in a total of 5173 hits (Table 2).

On the basis of titles and abstracts, the first author selected 43 studies that possibly met the seven inclusion criteria. These studies were tracked down and independently assessed on the seven inclusion criteria by the first two authors. Ten studies fulfilled all criteria. Eight of these articles were found in more than one database.

Study description

Table 3 shows the results of the assessment of their methodological quality.

The main characteristics and results of the included studies are presented in Table 4.

Intervention: audiotape or videotape

[TABLE 2]

[TABLE 3]

[TABLE 4]

   The first included study looked at an intervention for a pre-chemotherapy consultation [13]. One group of patients received individual education from an oncology nurse, the others received an additional general take-home instructional video.
   Patients completed a 23-item self-report questionnaire between three and four weeks after their first consultation to assess recall of information. The items were derived from literature and reflected the information presented by the nurses in the instructional sessions. Items were written as statements and required a yes/no response. The statements covered principles of chemotherapy, potential side effects and symptom management. Each score was reported as a percentage of correctly recalled information. Results showed that a general videotape, additional to verbal information, had no significant effect on recall when compared with verbal information only.
   The second study assessed the relative impact of audiotaping physician consultations, additional to written recommendations, on patients' recall [14].
   Patients were divided into two groups: one group received an audiotaped recording of their consultation as well as written recommendations; the other group received written recommendations only. The audiotape contained information, advices and instructions on the definition, goal, possible side effects of chemotherapy and symptom management.
   Recall was assessed one week after the first consultation (during the second visit to the clinic).
   Ten questions were given to the patient. These questions addressed medication, disease information and care management and had dichotome response categories ('yes'/'no' or 'true'/'false').
   Patients appeared to recall more information when written information was combined with an audiotape of the consultation.
   The third study compared the effect of two interventions on recall of information given prior to chemotherapy [15], namely patients receiving a general audiotape about cancer and patients receiving an audiotape of their specific consultation.
   A third group had the standard consultation.
   One to three weeks after the consultation with the oncologist, recall was assessed in a telephone interview with one open-ended question: 'what did the doctor say during the consultation' (unprompted recall) and 13 standardized questions regarding items that were regularly mentioned in the consultations: 'did the doctor mention anything about...' (prompted recall), e.g. regarding advantages and disadvantages of treatment, goals of treatment and practical details. Patients' answers were compared with the specific information given by the oncologist. Percentage of facts recalled accurately in total and within each category of information was reported. The results showed that a consultation tape did not improve recall in comparison with the no tape group and a general tape even decreased recall of information as compared with the control group.
   The fourth study examined whether audiotapes of bad news consultations with a physician improved cancer patients' retention of information given as compared with patients that had a standard consultation [16]. There were two assessments of recall, immediately after the consultation and again approximately two weeks later (two to three days before patients had breast surgery).
   Recall was measured with 'The Understanding Questionnaire' that was specifically constructed for this study and measured how well patients had understood different aspects of the treatment information, e.g. diagnosis, type of operation.
   The questionnaire contained a total of 18 questions divided into seven sections. A score was determined for each patient after listening to the patients' taped consultation. Hogbin et al. [16] concluded that an audiotape of the consultation improved recall of information when compared with no tape.
   The fifth study also investigated the effect of audiotaping a bad news consultation on recall [17].

There were two groups of patients. One group had their consultation with a physician taped, but were not provided with a copy. The other received a copy of their consultation to take home. Recall was measured six months after the consultation using the 'The Information Retention Questionnaire'.

This questionnaire required patients to recall particular aspects of the consultation regarding their diagnosis and treatment. Their answers were compared with the original recorded conversation.

More information about the assessment of recall is not given in the article. McHugh et al. [17] concluded that an audiotape of a consultation improved recall compared with no tape.

The sixth study examined the effect of an audiotape on recall of information compared with a standard consultation [18]. One group was given an audiotape of their consultation with an oncologist.

The consultations of the other group were not audiotaped. Both before the consultation and one week after the consultation, a clinical nurse specialist asked 11 questions concerning patients' level of information about their illness. The questions covered the diagnosis, parts of the body involved, severity of the illness, choice of treatments, what treatment was involved in terms of its aims, length, side effects and success rate. The conclusion was that an audiotape improved recall of information compared with no tape.

In the seventh included study [19], one group received an audiotape of the consultation with a gynaecologist or oncologist. Another group served as a control group and did not get an audiotape.

To assess recall, each audiotaped consultation was analyzed to itemize the actual information conveyed by the oncologist, against which patient recall of information was measured during a telephone interview. The information that was provided by the doctor could fall into nine categories, including diagnosis, prognosis, operation, trial, chemotherapy, radiotherapy, alternative treatment plan, direct side effects and other (longterm) consequences of treatment. Most of these categories consisted of subcategories. For each category, a percentage of correct answers was calculated. The results showed that patients who received an audiotape recalled more information than patients who were not provided with an audiotape.

Intervention: audiotape versus letter

One study looked at the effects of an audiotape versus an individualized summary letter on recall after patients' first consultation with an oncologist [20]. One group received the letter and then, after the first measurements, the tape. A second group received the tape followed by a letter, again after the first measurements. Both groups were phoned after 10 days to answer recall questions regarding the information material they received first. Next, patients received the second form of information material and the telephone interview was repeated.

The exact content of the telephone interview is not discussed in this article. Patients' answers were compared with salient points from the consultations that were selected by the doctor and focused on treatment, prognosis, symptoms, advices and clinical research. Tattersall et al. [20] concluded that the audiotape of the consultation and the individualized letter did not differentially affect patient recall.

Intervention: summary letter

One included study investigated whether a summary letter to patients that outlined the oncology follow-up consultation and was written by the oncologist influenced their recall of information [21]. One group of patients was given a letter after the consultation and a second group did not receive a letter. Recall was measured with a structured telephone interview and any misunderstanding was recorded. The interviews took place between three and 19 days after the consultation. More information about the assessment of recall was not available in the article. Damian and Tattersall [21] concluded that a summary letter outlining the consultation did not improve recall.

Intervention: question prompt sheet (QPS)

One included study investigated the effects of a question prompt sheet (QPS) [22]. A QPS is a structured list of questions designed to encourage patients to acquire information during a medical consultation. The QPS was provided 15–20 min prior to the initial consultation. There were three groups: patients who received standard care, patients who received a QPS which was actively endorsed by the doctor, and patients who received a QPS which was not actively endorsed. The QPS consisted of 17 questions commonly asked by patients. There was also space for patients to add additional questions. Recall was measured within 10 days of the consultation using a structured telephone interview. Seventeen questions divided into 13 categories [15] were asked regarding specific areas which may have been covered during the consultation. Each item recalled was recorded and compared with the specific items mentioned by the

oncologist during the consultation. The results showed that a QPS improved recall, but only when the doctor was proactive in addressing the sheet.

Data synthesis

Using the principles of the Best Evidence Synthesis (Table 1), taking into account the design, methodological quality and outcomes of the studies, the following conclusions can be drawn.

Audiotape of the consultation

There is scientific evidence that an audiotape of the consultation, complementary to oral information, has surplus value. Seven studies examined the effect of a specific audiotape on recall. In five of these studies a positive effect was found. Four studies, one high-quality (HQ) RCT [19] and three LQ CT studies [16–18] report added value of a specific audiotape upon a standard consultation only. In addition, one HQ RCT study [14] found that providing patients with a specific audiotape combined with a summary letter had a positive effect on recall when compared with a letter only. However, one HQ RCT study [15] did not find a positive effect of a specific audiotape on recall when compared with a standard consultation. A second study (LQ RT study) [20] found no difference between providing an audiotape or a letter, but it is not clear whether any one of the single interventions had added value compared with a standard consultation. The effects of videotapes have not been studied in isolation.

General audiotape

There is scientific evidence that a general audiotape, complementary to oral information, has no positive effect on recall when compared with verbal information alone. This evidence comes from two HQ RCT studies [13,15]. In fact, general audiotapes might even inhibit recall of information [15], but the evidence for this conclusion comes from only one study and is therefore limited.

Summary letter

There is no scientific evidence that providing patients with a letter after the consultation improves their recall of information. One LQ RCT study [21] found no effect of a summary letter on recall. Another LQ RT study [20] concluded that an individualized letter and an audiotape of the consultation did not differently affect patient recall. However, the added value of a letter or an audiotape in comparison with the standard consultation was not studied.

Question prompt sheet (QPS)

There is limited scientific evidence that a QPS improves recall, but only when the doctor is proactive in addressing patients' questions. This evidence comes from one HQ RCT study [22].

Sensitivity analysis

The results of the data synthesis appeared not to be sensitive to the principles used in the Best Evidence Synthesis. The results remained comparable with those described above when the analysis was repeated with LQ studies excluded and when studies were rated to be of 'high' quality if four or more criteria were met.

CONCLUSION AND DISCUSSION

This review on the effectiveness of interventions to improve cancer patients' recall of provided medical information presents the following conclusions.

There is evidence that the provision of a specific audiotape, complementary to oral information, has added value for recall of information. There is also evidence that providing patients with a general audiotape has no added value compared with a standard consultation only; there is even limited evidence that a general audiotape might inhibit patients' recall of information. Furthermore, there is limited evidence that the use of a QPS has a positive effect on recall of information, provided that the physician actively endorses this sheet. There is no evidence for an effect of providing patients with a summary letter on recall, but hardly any studies investigated this topic.

These results suggest that interventions that were tailored to individual cancer patients (consultation audiotape or QPS) were most effective. Regarding a QPS, a possible explanation for this effect could be that a QPS helps patients to express their information needs. If the information is of personal relevance and relates to what the patient finds important, the information may be better recalled [23,24]. This is in line with Kessels [2] who stated that specific information is better recalled than generally formulated

information. This might also be the explanation for the effectiveness of providing an audiotape of the consultation, which is by definition specific and individualized. McPherson et al. [25] noticed that specific information reduces the amount of information and ensures that only relevant information is provided, resulting in increased recall. Continuing assessment of cancer patients' information needs is necessary, so that variations in preferences may be accommodated [25].

The majority of cancer patients find recordings of their consultations valuable [26] and tend to prefer receiving an audiotape of their own consultation over a standardized audiotape [27].

Generally, patients also believe that a QPS is a useful tool [28], particularly to ask questions [29] or to achieve information needs and participation preferences [30]. Krishna and Damato [31] found that patients highly appreciated receiving a copy of the letter from the ocular oncologist to the referring physician, and considered a useful method of giving information. Despite the enthusiasm of patients, there might be barriers to implement the provision of personalized information aids as the majority of doctors remain opposed to offering patients a tape or summary letter [32], citing issues as patient confidentiality and medicolegal concerns as reasons for their reluctance [33].

There have been several studies that measured the effects of audiotape provision on outcome measures other than recall. Receiving an audiotape of the consultation enhances patients' participation in subsequent consultations and in decisions about their care, but the effects on satisfaction are mixed [26]. Patients' perception of having been provided with critical disease- and treatment-related information was found to be higher for patients who received an audiotape than for those who did not [34,35]. Effects on anxiety, depression or quality of life have not been established yet [26]. The use of a QPS also has positive effects on other outcome measures besides recall. A QPS in combination with a doctor who actively endorses this sheet shortened the consultation [22] and increased patient participation [22,36,37]. However, two studies only found increased participation in the diagnostic [38] or prognostic phase of the disease [39] and no or mixed effects were found on patient satisfaction [22,36–38] and anxiety [22,28,36,37,40].

The benefits of a QPS for cancer patients need to be explored further in future research.

Hardly any study investigated the effect of a summary letter or other written materials on recall in cancer patients. Therefore, this review could not establish robust evidence for these interventions.

Tattersall et al. [20] found no difference in actual recall of information between audiotapes or summary letters, but in the perception of cancer patients, audiotapes were significantly more effective than letters to remind them of what the oncologist had said. More research needs to be done on this topic. Studies into effects of written information on recall among other populations than cancer patients showed contradicting outcomes.

Some studies concluded that recall of medical information could be increased by providing the participant with written information [41–43] and further improved by adding adjunct questions in a booklet or integrating printed patient education materials into face-to-face teaching [44]. Other studies did not find a surplus value of written information, additional to verbal communication, on patients' recall of information [45–49]. An explanation for these mixed results might be the enormous variation of written information in readability, i.e. comprehensibility, visual appeal, legibility, text style, typeface, size and layout [50].

The methodology of our systematic review has some limitations. The 10 included studies in this review measured recall at different moments, some directly after the consultation or within a week, some within two to three weeks, and one study measured recall even after six months [17]. These differences make it difficult to compare results.

When recall is measured a long time after the initial consultation, it seems impossible to distinguish between effects on recall caused by the intervention and other influences. A comparison between studies was further complicated because most of the included studies had a small sample, from 16 to 158 (generally around 30) participants per condition, further complicating a comparison between studies. Most studies did not take into account that some factors (e.g. age, education level, anxiety, expectations, difficult medical terminology) may have a negative or positive effect on recall of information and did not control for these factors.

Last but not least, the 10 included studies differed in methods of measurement. Jansen et al. [51] indicated that different recall scores are obtained when using different measurement instruments.

Because of the variety in study design, methods and differences in outcomes assessed, the data could not be synthesized by statistical techniques, such as meta-analysis. Additional research needs to be done to establish solid conclusions.

For now, it is important that professionals in cancer care realize that they can improve patients' recall of medical information, and thus achieve better outcomes, by using techniques that are tailored to the individual patient and by adapting information to the specific information needs of the patient.

Appendix A: Criteria list for assessment of the methodological quality

	Validity criteria:	Yes	No	Don't know
A	Was the method of randomisation adequate?	☐	☐	☐
B	Was the treatment allocation concealed?	☐	☐	☐
C	Were the groups similar at baseline regarding the most important prognostic indicators?	☐	☐	☐
D	Was the patient blinded to the intervention?	☐	☐	☐
E	Was the care provider blinded to the intervention?	☐	☐	☐
F	Was the outcome assessor blinded to the intervention?	☐	☐	☐
G	Were co-interventions avoided or similar?	☐	☐	☐
H	Was the compliance acceptable in all groups?	☐	☐	☐
I	Was the drop out rate described and acceptable?	☐	☐	☐
J	Was the timing of the outcome assessment in all groups similar?	☐	☐	☐
K	Did the analysis include an intention-to-treat analysis?	☐	☐	☐

Methodological quality:

☐ **High–quality**; *the study adequately fulfilled 50% or more of the validity criteria (6 or more out of 11 criteria)*

☐ **Low–quality**; *the study fulfilled less than 50% of the validity criteria (< 6 out of 11 criteria)*

Remarks:

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OPERATIONALISATION OF THE CRITERIA LIST

A   Was the method of randomisation adequate, e.g.at patient level? Examples of adequate methods are computer generated random number table and use of sealed opaque envelopes. Score yes if the above is the case. Score no if a transparent system is used and score don't know *1when the method of randomization is not described in the article.

B   Was the assignment generated by an independent person not responsible for determining the eligibility of the patients? This person has no information about the persons included in the study and has no influence on the assignment sequence or on the decision about the eligibility of the patients.
  Score yes when the assignment has been taken place by an independent person. Score no if the above is not the case and score don't know if no information is given about who generated the assignment.

C   Are important prognostic indicators assessed at baseline? Are there no substantial differences between the intervention group and the controlgroup (for example regarding age, sex, type of cancer, duration of the disease, stadium of the disease, cognitive status and type of treatment).
  Score yes if the above is the case and score no if there are differences regarding the prognostic indicators at baseline that could undermine postintervention differences. Score also no if no testing has been done to check if there were actual differences (a table with prognostic indicators without explanation is not enough).
  Score don't know when no information had been given about prognostic indicators.

D   Was the patient blinded to the intervention? The reviewer determines if enough information is given in order to score a 'yes'. Score don't know if no information is given.

E   Was the care provider blinded to the intervention? The reviewer determines if enough information is given in order to score a 'yes'. Score don't know if no information is given.

F   Was the outcome assessor blinded to the intervention? The reviewer determines if enough information is given in order to score a 'yes'. Score don't know if no information is given.

G   Were co-interventions avoided in the design or were they similar between the interventiongroups and controlgroup? Score yes if the above is the case. Score no if there were co-interventions, not similar for the different groups. Score also no when no information has been given about cointerventions (so, not tested is also no).
  Note. This criterium cannot be decisive in determining low quality of an article.

H   Was the compliance rate among patients evaluated (e.g. did they view the received video or read the written material)? Score yes if the percentage of patients that used the intervention is above 70% in all groups.
  Score no if this percentage is below 70% and score don't know if no information about compliance has been given.

I   Is the number of patients described (and reasons given) that were included in the study but did not complete the intervention or were excluded from analysis? Is this percentage of withdrawals or drop-outs acceptable? Score yes if there is information from 80–100% of the randomised patients about the outcome assessment of recall. Score no if there is information from less than 80% of the randomised patients and score don't know if no information about withdrawals or drop-outs has been given.

J   Was the timing of the outcome assessment in all groups similar? Score yes if the above is the case (score also yes if a range is described, provided that this range does not have a large spread, for example more than three months). Score no if the timing of outcome assessment was not similar for all groups and score don't know if no information about the timing was given.

K   Was all available data included for analysis (intention to treat)? This means that all randomised patients were analysed in the group they were assigned to regardless of noncompliance and co-interventions.
  Score yes if the above is the case, score no when the analysis did not include an intention to treat analysis. Score don't know if no information about intention to treat is given.

TABLES

Table I. Principles of Best Evidence Synthesis

Evidence
Consistent, statistically significant findings in ⩾ two high-quality (HQ) RCTs
Moderate evidence
Consistent, statistically significant findings in ⩾ one HQ RCT and in ⩾ one low-quality (LQ) RCT or HQ CCT
Limited evidence
Statistically significant findings in ⩾ one HQ RCT
Or
Consistent, statistically significant findings in ⩾ two HQ CCTs (in the absence of HQ RCTs)
Indicative findings
Statistically significant findings in ⩾ one HQ CCT or LQ RCT (in the absence of HQ RCTs)
No/insufficient evidence
If the number of studies with significant findings is < 50% of the total number of studies within the same category of methodological quality and study design
Or
In case results of eligible studies do not meet one of the criteria for levels of evidence
Or
In case of conflicting results among RCTs and CCTs
Or
In case of no eligible studies

Table 2. Selection of studies per database

Source	Hits per strategy	Number of relevant studies
PubMed 1990–2007	1722	9
PsychINFO 1990–2007	197	0
CINAHL 1990–2007	3005	(2)
Cochrane 1990–2007	249	(8)
Snowball method 1990–2007		1
Total	5173	10

Table 3. Methodological quality of included studies

First author	Validity criteria met	Quality (<6)
Randomized clinical trials (RCTs)		
Bakker [13]	b,c,e,h,i,j	High
Brown [22]	a,b,c,g,j,k	High
Bruera [14]	a,b,d,e,f,h,i,j	High
Damian [21]	c,i,j	Low
Dunn [15]	a,c,e,h,j,k	High
McHugh [17]	a,b,e,h,k	Low
North [18]	c,h,i,j	Low
Ong [19]	c,d,e,h,i,j,k	High
Controlled clinical designs (CCTs)		
Hogbin [16]	a,e,h,j	Low
Other designs (RT)		
Tattersall [20]	c,e,h,i,j	Low

Table 4. Characteristics of included studies

First author (reference)	Methods	Quality	Moment of measuring recall	Groups	Participants. Sex (%); mean age (range/sd)	Conclusions
Bakker [13]	RCT	High	Between three and four weeks after the first visit	Group 1 (n=30): one to one nurse/patient teaching session Group 2 (n=31): one to one nurse/patient session and in addition a chemotherapy video to view at home	Outpatients (n=61) beginning a regimen of chemotherapy Group 1: 84% is female; 65% 18–30 yrs, 36% 31–50 yrs, 55% 51–70 and 3% older than 70 Group 2: 34% is female; 30% 31–50 yrs, 57% 51–70 yrs and 13% 70 yrs or older	The groups' mean number of responses was at least 80%. When comparing the groups' mean scores, no statistically significant difference was found; hence, an audiotape had no significant influence on recall when compared with verbal information alone
Brown [22]	RCT	High	Within ten days of the consultation	Group 1 (n=79): question prompt sheet (QPS) Group 2 (n=81): QPS and a doctor who actively addressed the QPS Group 3 (n=158): no QPS	Patients with heterogeneous cancers (n=318) attending an initial consultation 44.3% is female; 56.1 (range 18–83). There were no significant differences between the three groups	Patients who received a QPS and whose doctor was proactive addressing the QPS recalled significantly more information in total and regarding treatment issues and side effects than those with a QPS alone or without a QPS
Bruera [14]	RCT	High	One week after the initial consultation	Group 1 (n=31): written recommendations, no audiotape of the consultation Group 2 (n=29): written recommendations and an audiotape of the consultation	Outpatients with advanced cancer (n=60) 62.0 (sd=10)	The group who received written recommendations and an audiotape of the consultation recalled significantly more information in total and regarding medication than the group that received only written recommendations
Damian [21]	RCT	Low	Within three to 19 days of the consultation	Group 1 (n=24): received a letter outlining their consultation Group 2 (n=24): standard consultation without receiving a letter of the consultation	Patients with heterogeneous cancer (n=48) attending a general oncology outpatient clinic for a follow-up consultation Group 1: 80% is female; 53.0 (range 21–70) Group 2: 74% is female; 49.0 (range 28–71)	There was no significant difference in percentage of items recalled by the two groups
Dunn [15]	RCT	High	One to three weeks after the consultation	Group 1 (n=31): consultation and an audiotape describing cancer in general terms Group 2 (n=30): consultation and an audiotape of the consultation Group 3 (n=31): no tape	Outpatients with cancer (n=142) attending their first consultation 84% is female; 52.0	The consultation tape did not improve recall over the no tape control group, but the general tape caused a decrease of almost two items in total recall; spontaneous recall was significantly poorer with the general information tape
Hogbin [16]	CCT	Low	Following the consultation and two to three days	Group 1 (n=33): consultation and an audiotape of the consultation	Outpatients from various backgrounds with early breast cancer (n=67)	After two weeks the group receiving the audiotape had a significantly higher score

Table 4. (continued)

First author (reference)	Methods	Quality	Moment of measuring recall	Groups	Participants. Sex (%); mean age (range/sd)	Conclusions
				Group 2 (n = 34): consultation, but no tape	All patients are female Group 1: 57.5 (range 39–82) Group 2: 57.9 (range 36–79)	was found on questions concerning the nature of tests already performed and those to be performed in the future
McHugh [17]	RCT	Low	Six months after the initial consultation	Group 1 (n = 63): consultation and an audiotape of the consultation Group 2 (n = 54): consultation, but no tape	Outpatients (n = 117) attending their first clinical consultation Group 1: 63.5% is female; 45.0 (sd = 15.8) Group 2: 53.7% is female; 44.3 (sd = 17.7)	Tape group patients correctly recalled more of the facts they had been given concerning their diagnosis and treatment than did control group patients; this effect was statistically significant for five of the nine categories of information examined
North [18]	RCT	Low	One week after the consultation	Group 1 (n = 18): Consultation and audiotape of the consultation Group 2 (n = 16): Consultation, but no tape	Outpatients (n = 34) with advanced heterogeneous cancers Group 1: 50% is female; 54.1 Group 2: 56% is female; 56.4	The tape group patients were able to recall significantly more information concerning their illness, its treatment, treatment options and implications, how the illness had arisen and their prognosis than the no tape group
Ong [19]	RCT	High	After one week and after three months	Group 1 (n = 105): Consultation and audiotape of the consultation Group 2 (n = 96): Consultation but no tape	Outpatients (n = 201) referred to either the gynecology or medical outpatient clinic for their initial consultation Group 1: 80% is female; 54.0 (range 25–85, sd = 15.0) Group 2: 83% is female; 53.0 (range 15–93, sd = 16.5)	Patients provided with the tape were able to recall more information regarding all topics discussed during the consultation, except for trial procedure and chemotherapy; the tape group also recalled more information at both follow-up assessments
Tattersall [20]	Randomized cross-over trial	Low	Ten days after the consultation and seven to 10 days after the first measurement	Group 1 (n = 94): An audiotape after the consultation followed seven to 10 days later by the letter Group 2 (n = 88): A letter after the consultation followed seven to 10 days later by the audiotape	Inpatients and outpatients (n = 182) with heterogeneous cancers attending their first consultation Group 1: 81% is female; 51.0 (range 28–78) Group 2: 76% is female; 51.0 (range 16–80)	The audiotape of the consultation and the individualized letter did not differentially effect recall, which was on average 50% of the salient points identified by the physician

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