Systematic Review of the Effects of Shared Decision-Making on Patient Satisfaction, Treatment Adherence and Health Status

E.A.G. Joosten\textsuperscript{a,b} L. DeFuentes-Merillas\textsuperscript{a,b} G.H. de Weert\textsuperscript{c} T. Sensky\textsuperscript{e} C.P.F. van der Staak\textsuperscript{d} C.A.J. de Jong\textsuperscript{a,b}

\textsuperscript{a}Novadic-Kentron, Network for Addiction Treatment Services, St-Oedenrode, \textsuperscript{b}Nijmegen Institute for Scientist-Practitioners in Addiction (NISPA), Nijmegen, \textsuperscript{c}Julius Center for Health Sciences and Primary Health Care, UMC Utrecht, and \textsuperscript{d}Academic Centre for Social Sciences, Radboud University Nijmegen, Nijmegen, The Netherlands; \textsuperscript{e}Department of Psychological Medicine, Imperial College London, London, UK

Key Words
Shared decision-making \cdot Adherence \cdot Patient satisfaction \cdot Quality of life \cdot Well-being

Abstract

\textbf{Background:} In the last decade, the clinician-patient relationship has become more of a partnership. There is growing interest in shared decision-making (SDM) in which the clinician and patient go through all phases of the decision-making process together, share treatment preferences, and reach an agreement on treatment choice. The purpose of this review is to determine the extent, quality, and consistency of the evidence about the effectiveness of SDM. \textbf{Method:} This is a systematic review of randomised controlled trials (RCTs) comparing SDM interventions with non-SDM interventions. Eleven RCTs met the required criteria, and were included in this review. \textbf{Results:} The methodological quality of the studies included in this review was high overall. Five RCTs showed no difference between SDM and control, one RCT showed no short-term effects but showed positive longer-term effects, and five RCTs reported a positive effect of SDM on outcome measures. The two studies included of people with mental healthcare problems reported a positive effect of SDM. \textbf{Conclusions:} Despite the considerable interest in applying SDM clinically, little research regarding its effectiveness has been done to date. It has been argued that SDM is particularly suitable for long-term decisions, especially in the context of a chronic illness, and when the intervention contains more than one session. Our results show that under such circumstances, SDM can be an effective method of reaching a treatment agreement. Evidence for the effectiveness of SDM in the context of other types of decisions, or in general, is still inconclusive. Future studies of SDM should probably focus on long-term decisions.

Introduction

In recent decades, there has been an increasing emphasis on patient involvement in treatment decisions [1]. The role of the clinician is no longer an authoritarian person ‘who knows what’s right for you’. The relationship between clinician and patient has become more of a partnership [2]. Placing the patient at the centre of care [3] represents a new and important approach to improve the quality of medical care. Patient autonomy is seen as a basic value and underlying premise for the provision of healthcare itself [4]. Furthermore, in Europe the World Health Organisation has highlighted the need to involve patients in the development and delivery of healthcare.
and legislation has been passed in several countries aimed at strengthening the influence of patients [5].

One method of fostering these modern priorities of the clinician-patient relationship is through the process of shared decision-making (SDM). SDM is defined as an approach in which the clinician and patient go through all phases of the decision-making process together and in which they share the preference for treatment and reach an agreement on treatment choice [2, 6–8]. Forms of decision-making can be regarded as a continuum with two extremes – the ‘traditional medical model’ and the ‘informed medical model’ [2, 9, 10]. Table 1 demonstrates where SDM fits between these extremes.

Charles et al. [11] have identified necessary criteria for or characteristics of SDM. The first characteristic is that SDM involves clinician and patient. Often the treatment decision involves more than one patient and one clinician. The involvement of family members in treatment decision-making may be important. Furthermore, steps are taken to ensure that clinician and patient are both involved in the process of decision-making. Additionally, both parties take steps to build a consensus about the preferred treatment. At the very least, the clinician needs to explain the treatment alternatives and their possible consequences for the patient. The patient and clinician both bring information and values into their discussion. Finally, the patient and clinician together discuss and evaluate treatment options and together build a consensus on the treatment to implement.

Frequently, SDM studies comprise the use of decision aids. Decision aids are interventions designed to help people make specific and deliberative choices among options by providing relevant information about the options and outcomes relevant to a person’s health status [12]. A systematic review of decision aids concluded that they improve patients’ knowledge regarding treatment options and their condition [12]. Decision aids appear to have no effect on satisfaction with decision-making, anxiety, and health outcomes.

Published SDM studies have reported improvements in patient satisfaction, treatment adherence, quality of life and well-being [13] when clinicians adopt a patient-centred approach [14] and when patients are more involved and perceive greater control over their treatment choice [11, 15–17]. SDM should foster a patient-centred approach and empower patients, therefore the outcomes mentioned above are appropriate to use in assessing the effectiveness of SDM. The aim of the present systematic review was to examine the extent, quality and consistency of the published research evidence for the effectiveness of SDM with respect to these outcome variables.

**Method**

_Inclusion and Exclusion Criteria_ 

The review included studies that met all the following criteria: (1) studies in which a treatment decision needed to be made; (2) randomised controlled trial design; (3) involving patients aged 18
years or older faced with having to make a treatment decision; (4) comparing SDM with a control intervention, and (5) including one or more of the following outcome measures: degree of treatment adherence, patient satisfaction, well-being, and quality of life.

Excluded studies were those in which treatment decisions based on a choice between alternative treatment options did not explicitly involve shared decision-making between clinician and patient.

Search Strategy for Identification of Studies

The literature was searched with the WebSPIRS 5 search engine with the PsycINFO and Medline databases (from 1966 until July 2006). In addition, the Cochrane library, 2006, issue 2, was screened. All databases were searched from their dates of commencement. Reference lists of relevant studies were checked for further potential sources. The search was run with the following keywords: shared decision making, shared decisionmaking, shared decision-making, shared decision*, decision making*, randomised controlled trials*, adherence, patient compliance*, patient-participation*, patient satisfaction*, well-being and quality of life*. All the decision-making terms were combined with OR, and all the outcome measures were combined with the decision-making terms with AND. Only studies that were published in the English language were included.

Methodological Quality Assessment

Two reviewers (E.J. and L.D.F.) independently assessed the methodological quality of the randomised controlled trials (RCTs). The list of criteria recommended in the guidelines for systematic reviews issued by the Cochrane Back Review Group [18] was used, but adapted for this SDM review by the addition of four criteria (marked A–D in table 3). These items, key characteristics of SDM identified by Charles et al. [11], are: (A) SDM involves at least two participants – clinician and patient; (B) both parties share information; (C) both parties take steps to build a consensus about the preferred treatment, and (D) an agreement is reached on the treatment to implement.

An item was scored ‘positive’ (+) if the criterion was met, ‘negative’ (−) if it was not met, or ‘unclear’ (?) if it was not clear whether the criterion was met or not. Subsequently, all authors were consulted for additional information about the criteria that were scored ‘unclear’ in their studies. A total score was computed by counting the number of positive scores.

Study Selection

The search resulted in 328 references via PsychINFO, 659 in Medline, and 373 in Cochrane Library with the keywords: shared decision*, shared decisionmaking, shared decision making and shared decision-making. These keywords in combination with satisfaction, adherence/compliance, quality of life or well-being resulted in 26 references via PsychINFO, 121 in Medline and 32 in Cochrane Library. After deleting duplicates from all the databases consulted, the search finally resulted in 137 different references.

The first selection was based on titles, keywords and abstracts, and resulted in selecting 34 studies in a single reviewer format. The other articles were not primary research studies but reviews, editorials, letters, and quality improvement reports. All 34 studies included at least two patient groups: SDM and Non-SDM. Of these 34 studies, 17 were RCTs and 17 were non-RCTs (observational, prospective cohort, cross-sectional, self-reported, exploratory, and case control studies). Of the 17 RCTs, 11 focussed on SDM and included as outcome measures adherence, patient satisfaction, quality of life or well-being. Of the six excluded RCTs, in one article [19] the patient made the treatment decision, one measured clinician satisfaction [20], and four did not explicitly involve SDM of clinician and patient and/or were based on a choice between alternative treatment options [21–24].

Study Characteristics

Characteristics of the included studies (n = 11) are shown in table 2. Nine studies involved SDM in physical healthcare: three in cancer, and the remainder in ulcer disease, ischaemic heart disease, hormone replacement therapy, dentistry, and benign prostatic hypertrophy. Two studies examined the effects of SDM in mental healthcare (treatment for schizophrenia and depression).

It is important to take into account that the SDM interventions of the selected studies are heterogeneous (see also table 2). Most of the interventions used an interactive videodisc program, resulting in an individual summary of important points. A consultation with the clinician followed this program and results were discussed [25–28]. Other studies used a question/information sheet [29,30] or card ranking discussion [31] to promote patient participation in the treatment decision. In addition, general practitioners were trained in SDM skills [32] and behaviour change strategies were used to increase patient involvement [33]. Finally, two studies used SDM interventions within a treatment program [34–36].

Methodological Quality

In general, the methodological quality of the studies included in this review was high (table 3). All studies had six (>50%) or more positive scores on the validity criteria, the determined threshold for high quality [18].

Most of the studies did not include a blinded care provider (criterion 5). Furthermore, most patients were not
blinded regarding their treatment allocation (criterion 4). Most of the studies had three or four positive scores on the criteria of the key characteristics of SDM. The decision-making in all studies involved at least two parties (criterion A). However, in some studies it was not clear whether patient and clinician took steps to build a consensus (criterion C). In addition, none of the studies had a direct measure of the quality of the SDM interventions.

Problems arise in interpreting studies that yielded negative results – are these results attributable to failure of effective SDM, or to poor SDM technique or application?

Effectiveness of SDM
Five of the identified RCTs [31, 26–28, 30] reported no difference between SDM and control group on the out-

<table>
<thead>
<tr>
<th>Study (first author)</th>
<th>Population</th>
<th>Intervention</th>
<th>Outcome measures</th>
<th>Follow-up</th>
<th>Results (significant outcomes between conditions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenfield 1985 [33]</td>
<td>Ulcer disease</td>
<td>Single session</td>
<td>Patient satisfaction with care; increase of knowledge; physical limitations</td>
<td>6 to 8 weeks</td>
<td>Patient satisfaction: no differences Increase of knowledge: SDM &lt; control Physical limitations: SDM &gt; control</td>
</tr>
<tr>
<td>Morgan 2000 [25]</td>
<td>Ischemic heart disease</td>
<td>Single session</td>
<td>Patient satisfaction; increase of knowledge</td>
<td>6 months</td>
<td>Patient satisfaction: no differences Increase of knowledge: SDM &gt; control</td>
</tr>
<tr>
<td>Gattellari 2001 [30]</td>
<td>Cancer</td>
<td>Single session</td>
<td>Satisfaction with the consultation</td>
<td>3, 6, 9 and 12 months</td>
<td>Satisfaction: no differences</td>
</tr>
<tr>
<td>Murray 2001 [26]</td>
<td>Benign prostatic hypertrophy (primary care)</td>
<td>Single session</td>
<td>Quality of life; anxiety; general health status</td>
<td>3 and 9 months</td>
<td>Quality of life, anxiety, and general health status: no differences</td>
</tr>
<tr>
<td>Murray 2001 [27]</td>
<td>Hormone replacement therapy (primary care)</td>
<td>Single session</td>
<td>Quality of life; anxiety; general health status</td>
<td>3 and 9 months</td>
<td>Quality of life, anxiety, and general health status: no differences</td>
</tr>
<tr>
<td>Malm 2003 [34]</td>
<td>Schizophrenic disorders</td>
<td>Multiple sessions</td>
<td>Costumer satisfaction</td>
<td>2 years</td>
<td>Costumer satisfaction: SDM &gt; control</td>
</tr>
<tr>
<td>Von Korff 2003 [35]; Ludman 2003 [36]</td>
<td>Depression</td>
<td>Multiple sessions</td>
<td>Adherence; depression outcomes: SDM &gt; control</td>
<td>3, 6, 9 and 12 months</td>
<td>Adherence and depression outcomes: SDM &gt; control</td>
</tr>
<tr>
<td>Edwards 2004 [31]</td>
<td>GP patients with known atrial fibrillation, prostatism, menstruation or menopausal symptoms</td>
<td>Single session</td>
<td>Satisfaction</td>
<td>1 month</td>
<td>Satisfaction: SDM &lt; control</td>
</tr>
<tr>
<td>Van Roosmalen 2004 [32]</td>
<td>BRCA 1/2 mutation carriers</td>
<td>Multiple sessions</td>
<td>Well-being</td>
<td>3 and 9 months</td>
<td>Well-being: SDM &gt; control</td>
</tr>
<tr>
<td>Johnson 2006 [29]</td>
<td>Dentistry</td>
<td>Single sessions</td>
<td>EndoDB decision aid for treatment choices when root canal therapy or extraction is indicated</td>
<td></td>
<td>Satisfaction: no differences Anxiety: no differences Increase of knowledge: SDM &gt; control</td>
</tr>
</tbody>
</table>
come measures. These RCTs had in common that they involved decision-making in physical healthcare. Furthermore, these studies were dealing with a single decision or measurement after one consultation. In contrast with the former studies, van Roosmalen et al. [32], although showing no short-term effects, found a positive effect in the long term. The five remaining studies [25, 26, 29, 34–36] reported improved outcomes attributable to SDM. Of these five, Malm et al. [34] and Von Korff et al. [35]/Ludman et al. [36] involved decision-making in mental healthcare.

The most frequently used outcome measure, in seven studies, was patient satisfaction. The study by Malm et al. [34] is the only RCT that showed a positive outcome for patient satisfaction. The SDM intervention in this study concerned a treatment program, in contrast to the studies that report no differences between the conditions [25, 28–31, 33]. These studies involved a single decision or measurement after one consultation.

Other outcome measures were psychological and physical well-being (e.g. quality of life, anxiety, and depression). Two [32, 35, 36] out of five studies [26, 27, 29] showed positive effects of SDM with regard to these outcome measures. Van Roosmalen et al. [32] found a positive effect with respect to well-being. The study by Von Korff et al. [35]/Ludman et al. [36] applied depression outcome measures. These studies are heterogeneous.

Nevertheless, these studies involved patients making longer-term decisions and/or having chronic diseases. Another similarity between these studies is the duration of the intervention. The intervention in the study by van Roosmalen et al. [32] contains three sessions added to the treatment as usual and a 12-month intervention was used in the study by Von Korff et al. [35]/Ludman et al. [36].

One selected study had adherence as outcome measure [35, 36]. The patients in the intervention condition were significantly more likely to adhere to the medication (antidepressant) at 9- to 12-month follow-up measurement.

Finally, three selected studies [25, 29, 33] – in addition to the included outcome measures degree of treatment adherence, patient satisfaction, well-being, and quality of life – considered patient knowledge as outcome measure. The studies by Morgan et al. [25] and Johnson et al. [29] found no difference between intervention and control groups with regard to satisfaction. However, patients in the intervention group had significantly more knowledge of ulcer disease than controls. On the other hand, this study showed that patients in the experimental group reported significantly fewer physical limitations due to ulcer disease than controls.

---

**Table 3. Methodological quality of randomized controlled trials**

<table>
<thead>
<tr>
<th>Study (first author)</th>
<th>Criteria validity/reliability</th>
<th>Criteria key characteristics of SDM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morgan, 2000 [25]</td>
<td>+ + + – – + – + – 6</td>
<td>+ + + 4</td>
<td>10</td>
</tr>
<tr>
<td>Murray, 2001 [27]</td>
<td>+ + + – + + + + + + 8</td>
<td>+ + ? 3</td>
<td>11</td>
</tr>
<tr>
<td>Malm, 2003 [34]</td>
<td>+ + + – + + + + + + 10</td>
<td>+ + + 4</td>
<td>14</td>
</tr>
<tr>
<td>Endal, 2003 [28]</td>
<td>– – + + + + + + – 8</td>
<td>+ + + 4</td>
<td>12</td>
</tr>
<tr>
<td>Edwards, 2004 [31]c</td>
<td>+ + + – – + + + + + + 10</td>
<td>+ + + 4</td>
<td>14</td>
</tr>
<tr>
<td>Van Roosmalen, 2004 [32]a</td>
<td>+ – + – – – + + + + + – 7</td>
<td>+ ? ? 1</td>
<td>8</td>
</tr>
<tr>
<td>Johnson, 2006 [29]</td>
<td>+ – + + – + + + + + – 8</td>
<td>+ + + 4</td>
<td>12</td>
</tr>
</tbody>
</table>

1 = Adequate randomisation procedure; 2 = concealment of treatment allocation; 3 = similarity of baseline characteristics; 4 = blinding of patients; 5 = blinding of care provider; 6 = outcome assessor blinded to the intervention; 7 = co-interventions avoided or equal; 8 = compliance; 9 = withdrawal/dropout rate; 10 = similarity of timing outcome assessment; 11 = intention-to-treat analyses; A = the decision-making involves at least two parties (clinician-patient); B = both parties share the information during the intervention; C = both parties take steps to build a consensus; D = agreement is reached on the treatment to implement.

a See also van Roosmalen et al. [43]. b See also Katon et al. [44, 45]. c See also Elwyn et al. [46].
**Discussion**

SDM has been proposed as an important advance in modern clinical practice, and clinicians have been urged to adopt it in order to foster relationships with their patients that are more appropriate to the modern age. To our knowledge, this is the first systematic review of the effectiveness of SDM.

The methodological quality of the studies included in this review was high, and most studies included three or all four key characteristics of SDM. The two RCTs in mental healthcare scored positively on all four SDM criteria.

Limitations of the review include that it focussed only on English language publications. Furthermore, the heterogeneity of the samples, settings, and measurements might affect the generalisation of the results, although this heterogeneity also highlights the fact that SDM is a generic intervention, not dependent on the treatment setting or specialty. Moreover, a crucial point is that no study was excluded from the review on the basis of its ratings on the key characteristics of the SDM elements.

The studies with positive results are various. Studies that showed improvement in satisfaction, adherence, depression, and well-being had in common that the SDM interventions concerned treatment programs or contained more than one session. In addition, these successful studies involved patients making longer-term decisions and/or having chronic diseases, while most of the studies that did not show significant outcomes involved single or specific decisions. SDM can be regarded most appropriately as a collaborative process rather than one or two isolated events, and it is therefore not surprising that individual decisions have no significant measurable effect on factors that SDM might be expected to influence. A longer interaction between clinician and patient is perhaps necessary for patient’s attitudes regarding desire for information and participation in medical decisions to manifest themselves in information-seeking behaviour [37, 38].

People with chronic illnesses (e.g. people with schizophrenia, diabetes, asthma) have to change their lifestyle and habits to improve their health status. Montori et al. [39] indicated that treatment decisions in chronic care, relative to acute care decisions, are more likely to require a more active patient role in carrying out the decision and also offer extensive chances to revisit and reverse decisions. Acute care decisions may involve minimal patient participation, are often urgent, and may be irreversible. While longer-term decisions in chronic illness usually offer much scope for patient autonomy, urgent decisions about acute care usually involve the clinician in a more paternalistic role.

In addition to the included outcome measures (degree of treatment adherence, patient satisfaction, well-being, and quality of life), increase of knowledge was often used in the selected studies. Knowledge is an important and frequently named outcome measure. Patients need to be informed about complex decisions. They need to comprehend the treatment options and their benefits and harms in order to consider and discuss these with their clinician [12]. These studies had in common that they involved single or specific decisions. However, the results of these studies were contradicting.

It is interesting that the two studies regarding mental healthcare both reported a positive effect of SDM [34–36]. Patients in mental healthcare are particularly encouraged to focus on treatment issues that might affect their lifestyle and preferences [9]. Also, both of these studies focussed on people with chronic illnesses, and it has been demonstrated that chronically ill patients who are actively involved in health decision-making are more likely to enact and adhere to health behaviours, and to engage in other health-promoting or health-maintaining behaviours [40].

**Conclusions**

The good-quality research identified in this review indicates that SDM can be an effective and useful way of reaching a treatment agreement when patients have to make long-term decisions. Furthermore, research shows that SDM interventions are effective when they concern single, acute decisions. Not only do the published studies reveal no benefits of SDM under such circumstances, but perhaps such benefits should not be expected in any case. Using a decision aid is unlikely to produce the benefits of SDM on its own. The wider literature on SDM indicates that SDM is often complex and usually very time consuming [13, 41]. Selecting the best treatment is not always easy. It is likely that SDM has to take place in a structured, more frequent, and longer interaction. Second, given the complex nature of SDM, it is probably appropriate for trials to include multiple outcome measures. In addition, increase of knowledge seems to be an important topic in
The available evidence indicates that SDM can be effective in the context of chronic illness and when the intervention contains more than one session. However, considering the growing clinical interest in SDM, it is surprising and disappointing how little randomised controlled studies have been published regarding its efficacy. There is therefore an urgent need for further research.

**Acknowledgements**

We wish to thank the authors of the original papers for their comments on this review. The Dutch Ministry of Welfare and Sports (VWS) and the Dutch Organization for Health Research and Development (ZonMW) funded this project (grant No. 985-10-018). These agencies had no role in the conduct or interpretation of the study.

**References**


