

Shared decision-making behaviours in health professionals: a systematic review of studies based on the Theory of Planned Behaviour

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Abstract

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Background Shared decision making (SDM) requires health professionals to change their practice. Socio-cognitive theories, such as the Theory of Planned Behaviour (TPB), provide the needed theoretical underpinnings for designing behaviour change interventions.

Objective We systematically reviewed studies that used the TPB to assess SDM behaviours in health professionals to explore how theory is being used to explain influences on SDM intentions and/or behaviours, and which construct is identified as most influential.

Search strategy We searched PsycINFO, MEDLINE, EMBASE, CINAHL, Index to theses, Proquest dissertations and Current Contents for all years up to April 2012.

Inclusion criteria We included all studies in French or English that used the TPB and related socio-cognitive theories to assess SDM behavioural intentions or behaviours in health professionals. We used Makoul & Clayman's integrative SDM model to identify SDM behaviours.

Data extraction and synthesis We extracted study characteristics, nature of the socio-cognitive theory, SDM behaviour, and theory-based determinants of the SDM behavioural intention or behaviour. We computed simple frequency counts.

Main results Of 12 388 titles, we assessed 136 full-text articles for eligibility. We kept 20 eligible studies, all published in English between 1996 and 2012. Studies were conducted in Canada ($n = 8$), the USA ($n = 6$), the Netherlands ($n = 3$), the United Kingdom ($n = 2$) and Australia ($n = 1$). The determinant most frequently and significantly associated with intention was the subjective norm ($n = 15/21$ analyses).

Discussion There was great variance in the way socio-cognitive theories predicted SDM intention and/or behaviour, but frequency of significance indicated that subjective norm was most influential.

Background

The thoughtful and compassionate consideration of a patient's predicaments, preferences and rights is an important part of a clinician's individual expertise.¹ As patients increasingly report the desire to play a more active role in their health decisions, a framework for integrating clinical expertise with patient participation is in high demand.² The concept of shared decision making (SDM) is one such model, and is defined as a decisional process undertaken jointly by a patient and their clinician in which best clinical evidence is considered in the light of patient-specific characteristics and values.³ SDM has been described as the crux of patient-centred care.⁴ Three quarters of physicians report preferring to share decisions with their patients, and SDM may be associated with improved clinical outcomes, including treatment adherence.^{5–13} However, integrating SDM into daily practice often requires behaviour change on the part of the clinician and remains a challenge.^{14–18}

What might influence SDM behaviours can be determined using socio-cognitive theories, or 'theories where individual cognitions/thoughts are viewed as processes intervening between observable stimuli and responses in real world situations.'¹⁹ They have shown to be helpful in explaining behavioural intention and behaviour in relation to health outcomes and in designing theory-based interventions to change clinicians' behaviour (potentially more effectively than non-theory based interventions).^{20–24} In 2008, a systematic review by Godin *et al.* identified the Theory of Planned Behaviour (TPB) as the socio-cognitive theory most often used for the prediction of behaviours in health-care professionals.¹⁹ It concluded that the TPB performed favourably in comparison with other theories and that studies using the TPB had significantly

better predictive power. According to the TPB, three constructs independently determine an individual's intention to perform a particular behaviour. These are attitude (the extent of rational and emotional favourability to perform a behaviour), subjective norm (social pressures) and perceived behavioural control (perceived ease or difficulty to perform a behaviour, as well as anticipated obstacles).²⁵ The TPB is an extension of the Theory of Reasoned Action (TRA).^{26,27} The TPB differs from the TRA in that it adds perceived behavioural control as a determinant of both intention and behaviour. Performance of the behaviour is thus a result of motivation (intention) and ability (perceived behavioural control).²⁵

SDM is not a single behaviour, but rather an ensemble of different behaviours that together render the sharing of the decision possible and measurable.^{28–31} That is to say, it is possible to break down aspects of the clinical encounter into more specific SDM behaviours as an indirect way to assess the extent to which SDM occurs during a clinical encounter.³² In addition, examining specific behaviours rather than general behaviours should produce more accurate results, and to measure a behaviour it should ideally be defined in terms of target, action, context and time.³³ Although SDM constitutes a collection of behaviours that are ideally all present within the clinical encounter, in fact, physicians rarely perform SDM in its ideal form as an ensemble, but do perform clinical behaviours that match constituent elements of SDM.¹⁵

The TPB has been applied to a variety of different clinical behaviours, yet to the best of our knowledge no one has sought to systematically assess how it performs when used to assess SDM behaviours. Our aims were to provide information on the existing state of the literature on the use of the TPB and TRA on

SDM behaviours, and to identify which determinant was most influential on the intention to perform and/or performance of specific SDM behaviours by health professionals. Therefore, we systematically reviewed studies that used the TPB to assess SDM behaviours.

Methods

Literature search and sources of data

We searched PsycINFO (between 1960 and 2012), MEDLINE (1966–2012), EMBASE (1974–2012), CINAHL (1982–2012), Index to theses (1970–2012), PROQUEST dissertations and theses (1970–2012) and Current Contents (2006–2012) all years up to April 30, 2012. Our search strategy was based on the strategy used by Godin *et al.* of studies of health-care professionals' intentions and behaviours based on socio-cognitive theories.¹⁹ Systematic reviews in the field of SDM were examined to verify whether a potentially relevant article had been omitted.^{16,17,34–38}

Inclusion and exclusion criteria

No study design was excluded, and we considered studies if they had been published in English or French. We included studies that assessed health professionals' intention and/or performance of a SDM behaviour using the TPB, the TRA or explicit extensions of these models as theoretical frameworks are often customized using elements from more than one framework.^{19, 39} We defined 'health professionals' as physicians of any specialty, as well as nurses, chiropractors, dentists, dietitians, kinesiologists, pharmacists, physical therapists, mental health professionals and other professionals who self-identified as 'health professionals.' The clinical behaviours examined had to relate to a clinical encounter (i.e. a clinician with a patient) and/or a simulation of such an encounter. Studies that examined the behaviours of pre-clinical students were excluded since they do not have responsibility for patients. We also excluded

studies that assessed clinicians' behaviours relating to other aspects of their health practice, such as personal health-related behaviours (e.g. exercising).

As SDM can be thought of a collection of behaviours within the clinical encounter, understanding individual SDM behaviours and their psychosocial determinants is useful and can be done by mapping clinical behaviours to SDM behaviours. There are as a result numerous studies that explore one or more elements of SDM without focusing explicitly on SDM. We therefore judged that capturing clinical behaviours that constitute specific SDM behaviours should allow us a more precise understanding of their psychosocial determinants, and give us a better idea of the determinants of SDM behaviours as a whole. The specific mention of the term 'shared decision making' was not an inclusion criterion, as we were interested in any explanation of a SDM behaviour using the TPB/TRA.

We defined clinical behaviour as 'any behaviour performed in a clinical context.'¹⁹ To qualify as a relevant clinical behaviour, it had to encompass at least one of the 13 essential or ideal SDM behaviours as defined by Makoul & Clayman (Table 1).³⁰ We used Makoul & Clayman's model because of its applicability to clinical practice and because it presents an extensive review of 161 SDM definitions. Clinical behaviours were mapped to SDM behaviours according to the intent of the behaviour according to the authors. For instance, an article assessing the clinical behaviour of nurses' performance of culturally congruent care for Muslims was mapped to the SDM behaviour 'assessing patient values and preferences,' as the authors report that the intent of the behaviour is to 'provide care that fits with the values of the people.'⁴⁰ Clinical behaviours that encompassed more than one behaviour (the use of a decision aid, for instance) were mapped to all the relevant SDM behaviours.

Two independent reviewers undertook the inclusion process independently. Disagreements were solved through discussion with FL.

Table 1 SDM behaviour as described by Makoul & Clayman (2006)

Essential elements	Define/explain problem
	Present options
	Discuss pros/cons
	Patient values/preferences
	Discuss patient ability/self-efficacy
	[Share] knowledge/[make] recommendations
	Check/clarify understanding
	Make or explicitly defer decision
	Arrange follow-up
	Unbiased information
Ideal elements	Define roles (desire for involvement)
	Present evidence
	Mutual agreement

Data extraction and quality assessment

We extracted information on study authorship, country and year of publication. We extracted the type of study design as well as the type(s) of professional, the level of care (primary, specialized or unclear) and the clinical context. We extracted all theoretical and sociodemographic psychosocial variables used by the authors to explain the intention or performance of the SDM behaviour. We reported all the variables whose association with SDM behavioural intention or SDM behaviour was reported as statistically significant in regression models. We used the Mixed Methods Appraisal Tool (Version 2011) in order to appraise the quality of our studies. This tool was chosen because it provides a comprehensive and adaptable framework for assessing the methodological quality of a wide array of study types.^{41,42}

Data analysis and synthesis

No data re-analysis was carried out. We computed simple descriptive statistics of the country of origin, type of study, clinical context and types of professionals in the population at hand, the number of times that the theories were used (TPB, TRA and/or mix) and the SDM-specific behaviours to which the clinical behaviours could be mapped. We reported the frequency of each psychosocial variable

mentioned as statistically significant in the explanation of intention and/or performance of the behaviour.

Results

Description of included studies

Figure 1 is a flow diagram of our search strategy. Out of 12 388 titles (76 from Godin *et al.* and 12 312 from our literature review), we identified 136 articles that used a social cognitive theory to explain a clinical behaviour that exemplified one or many SDM behaviours. From these, we retained a total of 20 studies that met our inclusion criteria (Cohen's kappa = 0.78).^{40,43–61}

Of these studies, seven (35%) were from Canada,^{46,47,50,52,54,55,57} seven (30%) were from the USA,^{40,43–45,51,56,58} three (15%) were from the Netherlands,^{59–61} two (10%) were from the United Kingdom,^{48,49} and one (5%) was from Australia.⁵³ Sixteen studies (80%) were cross-sectional surveys,^{40,43,45,46,49–53,55–61} one (5%) was a time-series quasi-experiment,⁴⁴ one (5%) was a before-and-after study,⁵⁴ one (5%) was a randomized controlled trial,⁴⁸ and one (5%) was a qualitative focus group (Table 2).⁴⁷ All studies met at least three of the four methodological criteria for quality appraisal (Table 2). The most significant bias in the included studies was the lack of a satisfactory response rate for cross-sectional surveys (defined as $\geq 60\%$).⁴¹

Clinical setting and participants

The 20 studies included 4747 health professionals (average: 237 participants/study, range: 21 to 765). Ten studies (50%) assessed behaviours in the context of primary care,^{43,45,50,51,54–58,60} six studies (30%) assessed behaviours in specialized care,^{40,44,48,49,52,53} and four studies (20%) did not specify the level of care in which the behaviour was examined.^{46,47,59,61} Clinical contexts varied greatly, but the two most prevalent were family practice (six studies or 30%)^{45,50,51,54,58,60} and neonatal care (four

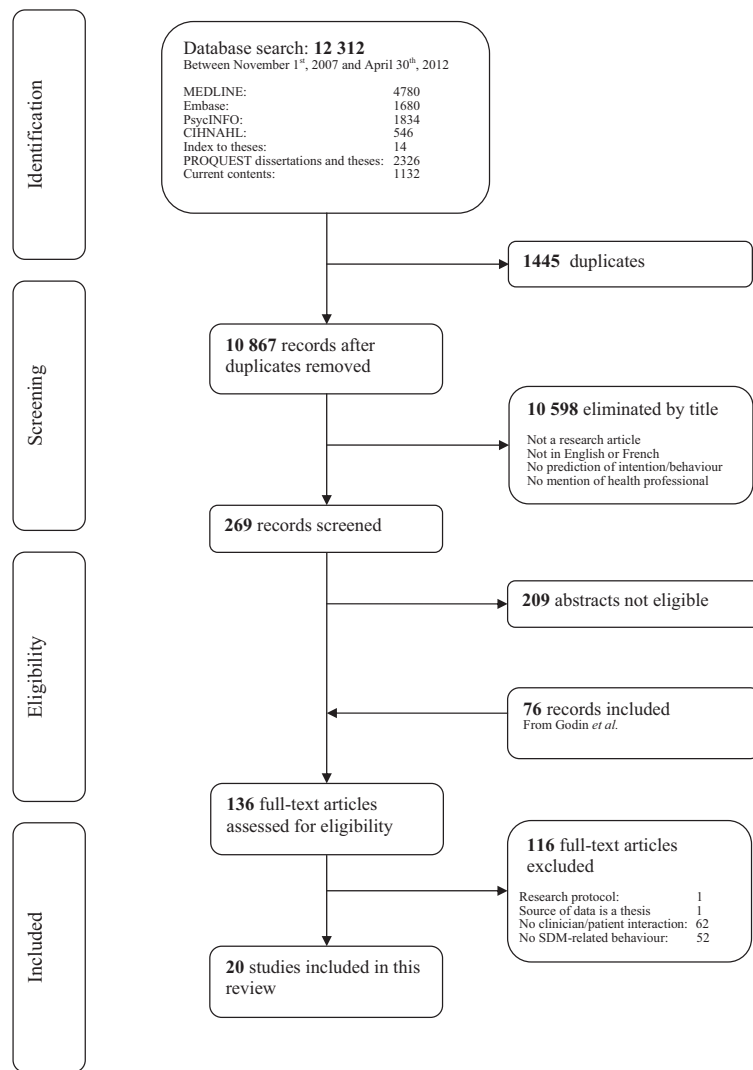


Figure 1 The PRISMA statement flow diagram.

studies or 20%^{43,44,46,57}). Eight studies (40%) assessed the intentions and/or behaviours of physicians,^{45,50–52,54–56,61} four (20%) of nurses,^{40,43,44,57} one (5%) of dietitians⁴⁷ and seven (35%) measured the intentions and/or behaviours of many different types of professionals at once.^{46,48,49,53,58–60} Among these, only two studies (both from a single larger project)^{48,49} measured the intentions and/or behaviours of health professionals using an interprofessional approach.

Theories used to assess SDM behaviours

Of all 20 studies retained, twelve (60%) used only the Theory of Planned Behav-

our,^{40,45,47,50–55,57–59} five (25%) used the Theory of Planned Behaviour with other theories,^{46,48,49,60,61} two (10%) used the Theory of Reasoned Action,^{43,44} and one (5%) compared the Theory of Planned Behaviour with the Theory of Reasoned Action.⁵⁶ Of the five studies that included components of other theories, one used elements of the Social Cognitive Theory,⁴⁹ one used elements of the Social Cognitive Theory as well as elements of the Protection Motivation Theory,⁶⁰ one used elements of the Social Cognitive Theory as well as elements of the Implementation Intentions Theory,⁴⁸ one included elements of Triandis' Theory of Interpersonal Behaviour,⁴⁶ and one included elements of the Attitude/social influence/self-efficacy model.⁶¹

Table 2 Summary of the included articles

Principal investigator	Year	Country	Profession	Number of participants	Level of care/ Clinical context	Type of study	Clinical behaviour	SDM-specific behaviour(s) according to Makoul & Clayman	Theories used	Explicit mention of the terms 'Shared Decision Making'	Quality Assessment Score on MMAT
Bernaix	2000	USA	Nurses	50	Primary/ Neonatal care	Cross-sectional survey	Providing (technical, emotional, informational) in-hospital support to breastfeeding mothers	Discuss pros/cons Patient values/preferences Knowledge/recommendation Check/clarify understanding Present evidence Define/explain problem Discuss pros/cons Knowledge/recommendations	Theory of Reasoned Action	No	4/4
Bernaix	2008	USA	Nurses	32	Specialized/ Neonatal care	Time-series design	Providing mothers with lactation support	Present evidence Define/explain problem Discuss pros/cons Knowledge/recommendations	Theory of Reasoned Action	No	3/4
Busha	1998	USA	FPs	100	Primary/Family practice	Cross-sectional survey	Providing preventive reproductive health care to adolescents (educating about STD and pregnancy prevention)	Present evidence Knowledge/recommendations	Theory of Planned Behaviour	No	3/4
Daneault	2004	Canada	Dietitians and nurses	151	Unspecified/ Neonatal care	Cross-sectional survey	Always recommending breastfeeding for a period of 6 months to new mothers	Knowledge/recommendations	Theory of Planned Behaviour with elements of Triandis' Theory of Interpersonal Behaviour	No	3/4
Desroches	2011	Canada	Dietitians	21	Unspecified/ Nutrition	Focus groups	Exploring dietitians' salient beliefs with regard to presenting dietary treatment options Exploring dietitians' salient beliefs with regard to clarifying patients' values and preferences	Present options Patient values/preferences	Theory of Planned Behaviour	Yes	4/4

Table 2 Continued

Principal investigator	Year	Country	Profession	Number of participants	Level of care/ Clinical context	Type of study	Clinical behaviour	SDM-specific behaviour(s) according to Makoul & Clayman	Theories used	Explicit mention of the terms 'Shared Decision Making'	Quality Assessment Score on MMAT
Eccles	2009	United Kingdom	MDs, nurses, social workers, care managers, team leaders, support workers	644	Specialized/ Mental health	Randomized controlled trial	Disclosing a diagnosis of dementia; (1) finding out what the patient already knows/suspects about their diagnosis; (2) using the actual words 'dementia' or 'Alzheimer's disease'; (3) exploring what the diagnosis means to the patient	Check/clarify understanding	Mixed: Theory of Planned Behaviour, Social Cognitive Theory and Implementation Intentions Theory	No	3/4
Foy	2007	United Kingdom	MDs, nurses, professions allied to medicine, social workers, support workers	399	Specialized/ Mental health	Cross-sectional survey	Disclosing a diagnosis of dementia; (1) finding out what the patient already knows/suspects about their diagnosis; (2) using the actual words 'dementia' or 'Alzheimer's disease'; (3) exploring what the diagnosis means to the patient	Check/clarify understanding	Mixed: Theory of Planned Behaviour and Social Cognitive Theory (and exploratory team variables)	No	3/4
Godin	2007	Canada	FPs, medical residents and 4th year medical students	714	Primary/Family practice	Cross-sectional survey	Encouraging patients to follow complementary and alternative medicine	Present options Patient values and preferences Knowledge/recommendations	Theory of Planned Behaviour	No	3/4
Harbour	2009	USA	FPs and an internist	26	Primary/Family practice	Cross-sectional survey	Recommending physical activity	Knowledge/recommendations	Theory of Planned Behaviour	No	3/4
Jones	2005	Canada	Oncologists	281	Specialized/ Oncology	Cross-sectional survey	Recommending physical activity to cancer patients	Knowledge/recommendations	Theory of Planned Behaviour	No	3/4
Kam	2012	Australia	Nurses, MDs and other health professional	72	Specialized/ Oncology	Cross-sectional survey	Referring cancer patients to supportive services: (1) cancer helpline, (2) allied health professionals and (3) complementary therapies	Presenting options Patient values and preferences Discuss patient ability/self-efficacy Knowledge/recommendations	Theory of Planned Behaviour	No	3/4

Table 2 Continued

Principal Investigator	Year	Country	Profession	Number of participants	Level of care/ Clinical context	Type of study	Clinical behaviour	SDM-specific behaviour(s) according to Makoul & Clayman	Theories used	Explicit mention of the terms 'Shared Decision Making'	Quality Assessment Score on MMAT
Légaré	2007	Canada	FPs	122	Primary/Family practice	Before-and-after study	Screening for decisional conflict using the DCS, before and after an interactive workshop	Present options Discuss pros and cons Patient values and preferences Knowledge/recommendations Check/clarify understanding Define roles Present evidence Mutual agreement	Theory of Planned Behaviour	Yes	4/4
Légaré	2011	Canada	FPs	41	Primary/Prenatal screening counselling	Cross-sectional survey	Engaging in SDM for prenatal screening for Down syndrome	Define/explain problem Present options Discuss pros/cons Patient values/preferences Knowledge/recommendations Check/clarify understanding Define roles Present evidence Mutual agreement Patient values/preferences	Theory of Planned Behaviour	Yes	4/4
Marrone	2008	USA	Nurses	208	Specialized/Critical care	Cross-sectional survey	Providing culturally congruent care to Arab Muslims	Mutual agreement Patient values/preferences	Theory of Planned Behaviour	No	3/4
Millstein	1996	USA	FPs, paediatricians, ob-gyn's, internists	765	Primary/Adolescent health	Cross-sectional survey	Educating adolescent patients about the transmission of HIV and other STDs	Knowledge/recommendations Present evidence	Comparison of Theory of Reasoned Action vs. Theory of Planned Behaviour	No	4/4
Payant	2008	Canada	Nurses	97	Primary/Neonatal care	Cross-sectional survey	Providing continuous labour support to women (emotional support, physical comfort, advocacy and offering of information)	Present options Patient values and preferences Knowledge/recommendations Present evidence	Theory of Planned Behaviour	No	4/4

Table 2 Continued

Principal investigator	Year	Country	Profession	Number of participants	Level of care/ Clinical context	Type of study	Clinical behaviour	SDM-specific behaviour(s) according to Makoul & Clayman	Theories used	Explicit mention of the terms 'Shared Decision Making'	Quality Assessment Score on MMAT
Politi	2010	USA	MDs, a nurse practitioner and a dietitian	122	Primary/ Family practice	Cross-sectional survey	Disclosing uncertainty to patients with regard to engaging in SDM	Define/explain problem Present options Discuss pros/cons Knowledge/ recommendations Check/clarify understanding Present evidence Mutual agreement	Mixed model with variables from Theory of Planned Behaviour	Yes	4/4
Sassen	2011	Netherlands	Nurses and physiotherapists	278	Unspecified/ Cardiovascular health	Cross-sectional survey	Encouraging physical activity in patients with cardiovascular risk factors	Knowledge/ recommendations	Theory of Planned Behaviour	No	4/4
Ten Wolde	2008	Netherlands	FPs and pharmacists	478	Primary/Family practice	Cross-sectional survey	Educating patients about use of benzodiazepines	Define/explain problem Discuss pros/cons Knowledge/ recommendations Unbiased information Present evidence	Mixed: Theory of Planned Behaviour, Social Cognitive Theory and Protection Motivation Theory	No	3/4
Van Rijsen	2011	Netherlands	Physicians	146	Unspecified/ Disability assessments	Cross-sectional survey	Understanding physicians' communication behaviour in disability assessment: (1) intention to inform claimants carefully, (2) intention to take aspects of the working situation into consideration, (3) intention to take personal aspects of claimants into consideration	Define/explain problem Discuss pros/cons Check/clarify understanding Patient values/ preferences Patient ability/ self-efficacy	Mixed: Theory of Planned Behaviour with elements of Attitude/social influence/self-efficacy model	No	3/4

FPs, Family practitioners; MDs, Medical doctors.

SDM-specific behaviours most often assessed

Figure 2 presents the frequency of the SDM behaviours studied in the 20 studies. The studies assessed 29 individual clinical behaviours which were mapped to SDM behaviours. Sharing knowledge and making recommendations was the SDM behaviour studied most often, being assessed in 15 studies (75%).^{43–46,50–60} The second most often assessed SDM behaviour was assessing patient values and preferences, evaluated in nine studies (45%).^{40,43,47,50,53–55,57,61} The third most often assessed SDM behaviour was presenting evidence (8/20, 40%).^{43,44,54–58,60} Making or explicitly deferring the decision, as well as arranging a follow-up, were never assessed (0%). The term ‘shared decision making’ was explicitly used in four studies (20%).^{47,54,55,58} Careful examination of these studies revealed that these four – in contrast with the other 16 – focused explicitly on SDM.

Psychosocial variables predicting intention

Five studies (25%) conducted no regression analyses to predict health professionals’ intention to engage in the SDM behaviour(s) studied.^{40,44,47,48,58} Of the 15 remaining studies, four assessed more than one behavioural intention using the TPB or TRA^{49,57,60,61} (Table 3). This resulted in 21 quantitative behavioural analyses assessing health professionals’ intention to engage in a SDM-specific behaviour across 15 studies. Subjective norm was significantly associ-

ated in 15 assessments (71% of the time), perceived behavioural control in 11 assessments (52%) and attitude in 10 assessments (48%). Of these 15 quantitative studies, eleven studies (73%) found more psychosocial constructs that significantly associated with intention/behaviour in their model than the three proposed by the TBP,^{43,45,46,49,50,53–55,59–61} three (20%) assessed intention using the three main constructs,^{52,56,57} and one (7%) computed composite scores of the three main variables as well as scores for the main constructs.⁵¹ Predictability in the variance of intention varied greatly, with R^2 values ranging from 0.15 to 0.88.

Psychosocial variables predicting SDM behaviour

Table 4 presents the characteristics of the studies that assessed SDM-specific behavioural performance. SDM behaviour was assessed in six studies (30%).^{43,44,48,52,56,59} Four studies (20%) conducted regression analyses to assess which constructs contributed significantly to the prediction of behaviour performance.^{43,52,56,59} All of them included other constructs than the two main theoretical predictors (intention and perceived behavioural control). Of these four quantitative analyses, intention was a significant predictor of behaviour in three studies (75%),^{52,56,59} whilst perceived behavioural control was significantly associated in only one study.⁵⁶ One study found no association between intention and behaviour.⁴³ Predictability in the

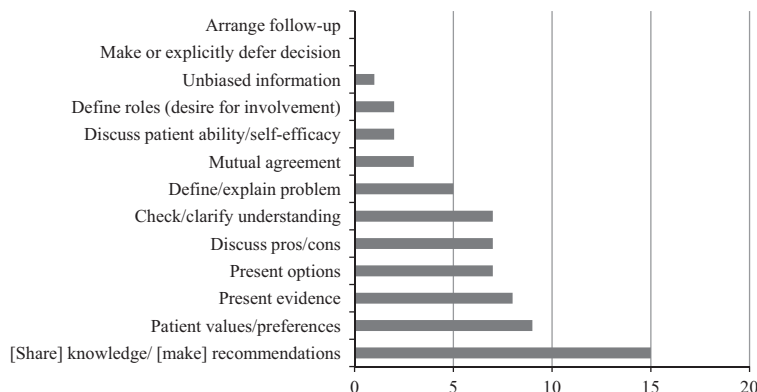


Figure 2 Number of assessments of SDM behaviours studied.

Table 3 Associations between theoretical constructs and behavioural intention

Article	β						R^2
	Clinical behaviour	SDM behaviour	Attitude	Subjective norm	Perceived behavioural control	Others	
Bernaix	Providing (technical, emotional, informational) in-hospital support to breastfeeding mothers	Discuss pros/cons Patient values/preferences Knowledge/recommendation Check/clarify understanding Present evidence	(β unknown)*	(β unknown)**	Not applicable	Ethnicity (β unknown)* Nurses' personal breastfeeding experience Knowledge scores	0.72
Bernaix	Providing mothers with lactation support	Define/explain problem Discuss pros/cons Knowledge/recommendations Present evidence	No regression analysis conducted Evaluation of a training programme				
Busha	Providing preventive reproductive health care to adolescents (educating about STD and pregnancy prevention)	Knowledge/recommendations	(β varied) [†]	(β varied)* [†]	(β varied)* [†]	Benefit** [†]	Varied between 0.286 and 0.472 [†]
Daneault	Always recommending breastfeeding for a period of 6 months to new mothers	Knowledge/recommendations	0.08	0.08	0.47***	Perceived professional norm 0.24** Perceived personal norm 0.10 Profession (dummy variable)	0.69
Desroches	Exploring dietitians' salient beliefs with regard to presenting dietary treatment options Exploring dietitians' salient beliefs with regard to clarifying the patients' values and preferences	Present options Patient values/preferences	Focus groups/No quantitative analysis				
Eccles	Disclosing a diagnosis of dementia; (1) finding out what the patient already knows/suspects about their diagnosis; (2) using the actual words 'dementia' or 'Alzheimer's disease'; (3) exploring what the diagnosis means to the patient	Check/clarify understanding	Performance of quantitative constructs' not presented				

Table 3 Continued

Article	Clinical behaviour	SDM behaviour	β				R^2
			Attitude	Subjective norm	Perceived behavioural control	Others	
Foy	Disclosing a diagnosis of dementia; (1) finding out what the patient already knows/suspects about their diagnosis; (2) using the actual words 'dementia' or 'Alzheimer's disease'; (3) exploring what the diagnosis means to the patient	Check/clarify understanding	Not included in final model (not significant)	0.334***	0.213***	Perceived reliability of colleagues 0.252***	0.356
						Outcome expectancies 0.145**	
						Number of professional groups responsible for behaviour -0.128**	
Godin	Encouraging patients to follow complementary and alternative medicine	Present options Patient values and preferences Knowledge/recommendations	Emotional attitude -0.133** (attitude not significant)	0.183***	Not included in final model (not significant)	Self efficacy	0.635
						Perceived role	
						Outcome expectancies 0.422***	
Harbour	Recommending physical activity	Present options Patient values and preferences Knowledge/recommendations	Not included in final model (not significant)	0.334***	0.296***	Perceived reliability of colleagues 0.284***	0.527
						Self efficacy 0.154***	
						Perceived role 0.127***	
Jones	Recommending physical activity to cancer patients	Knowledge/recommendations	0.22***	Not included in final model (not significant)	0.29***	Perceived reliability of colleagues 0.109**	0.75
						Outcome expectancies	
						Moral norm 0.34***	
Kam	Referring cancer patients to supportive services: (1) cancer helpline, (2) allied health professionals and (3) complementary therapies	Presenting options Patient values and preferences Discuss patient ability/self-efficacy Knowledge/recommendations	Not included in final model (not significant) [§]	0.32*	Not included in final model (not significant) [§]	Descriptive norm 0.13***	0.43
						Professional status**	
						Composite score for perceived behavioural control -0.02*	
Légaré	Screening for decisional conflict using the DCS, before and after an interactive workshop	Present options Discuss pros and cons Patient values and preferences Knowledge/recommendations Check/clarify understanding Define roles Present evidence Mutual agreement	Not included in final model (not significant) ^{††}	At exit: 0.478	At exit: 0.552***	Composite score for attitude	0.78
						Composite score for subjective norm	
						Past referrals (β varied) ^{**}	
						Awareness (β varied) ^{**}	Varied between 0.42 and 0.74

Table 3 Continued

Article	Clinical behaviour	SDM behaviour	β				R^2
			Attitude	Subjective norm	Perceived behavioural control	Others	
Légaré	Engaging in SDM for prenatal screening for Down-syndrome	Define/explain problem Present options Discuss pros/cons Patient values/preferences Knowledge/recommendations Check/clarify understanding Define roles Present evidence Mutual agreement	0.51***	0.15*	0.15	Perceived moral correctness 0.11	0.52
Marrone	Providing culturally congruent care to Arab Muslims	Patient values/preferences Mutual agreement	No regression with intention			Certification in critical care nursing 0.03* Past attendance in a transcultural nursing course 0.01*	Not available
Millstein	Educating adolescent patients about the transmission of HIV and other STDs	Knowledge/recommendations Present evidence	0.11***	0.21***	0.37***		0.27
Payant	Providing continuous labour support to women (emotional support, physical comfort, advocacy and offering of information)	Present options Patient values and preferences Knowledge/recommendations Present evidence	Epidural scenario: 0.4 ***	Epidural scenario: 0.54***	Epidural scenario: Not included in final model (not significant)		Epidural scenario: 0.88
			No epidural scenario: Not included in final model (not significant)	No epidural scenario: 0.56***	No epidural scenario: 0.23**		No epidural scenario: 0.55
Politi	Disclosing uncertainty to patients with regard to engaging in SDM	Define/explain problem Present options Discuss pros/cons Knowledge/recommendations Check/clarify understanding Present evidence Mutual agreement	Theory-based study of physicians' reactions to uncertainty in the context of SDM. Not on intention to engage in SDM				
Sassen	Encouraging physical activity in patients with cardiovascular risk factors	Knowledge/recommendations	0.443***	0.201***	0.137*	Descriptive norm Moral norm Barriers Habit	0.42

Table 3 Continued

Article	Clinical behaviour	SDM behaviour	β				R^2
			Attitude	Subjective norm	Perceived behavioural control	Others	
Ten Wolde	Educating patients about use of benzodiazepines	Define/explain problem Discuss pros/cons Knowledge/recommendations Unbiased information Present evidence	FP: Not tested	FP: 0.12*	FP: Not tested	FP: Response efficacy 0.02 Disadvantages 0.27** Positive outcome expectation -0.01 Negative outcome expectation -0.11* Self efficacy -0.14* Pharmacists: Response efficacy 0.06 Disadvantages 0.12 Positive outcome expectation 0.19* Negative outcome expectation -0.07	FP: 0.15
Van Rijnssen	Understanding physicians' communication behaviour in disability assessment: (1) intention to inform claimants carefully, (2) intention to take aspects of the working situation into consideration, (3) intention to take personal aspects of claimants into consideration	Define/explain problem Check/clarify understanding Patient ability/self-efficacy Discuss pros/cons Patient values/preferences	0.48*	0.14 (Social influences)	Not included in final model (not significant)	Pharmacists: Not tested 0.23* 0.14 (Social influences) Not included in final model (not significant)	Pharmacists: 0.22

†Analyses varied between demographic groups (12–13 year-olds, 15 year-olds, males and females) and behaviour (Educate about STD prevention vs. Educate about pregnancy prevention). We present the constructs that were consistently significantly associated with intention.

‡Professional status was significantly associated with intention and depends on the profession ($\beta = -0.07^*$ for general practitioners and $\beta = -0.07^{***}$ for medical residents).

§Results from best fit analysis in which only two constructs enabled prediction of 43.33% of the variance in intention. Using all predictor variables, 51% of the variance was explained.

¶Regression coefficients differed between the three referrals (Cancer Council Services, Allied Health Services, Complementary Therapies). We present the constructs that were consistently significantly associated with intention.

††Regression analyses were carried out before and after the intervention. We present the constructs associated with intention at study exit to represent appropriately the SDM behaviour evaluated.

* $P < 0.05$.

** $P < 0.01$.

*** $P < 0.001$.

Table 4 Associations between theoretical constructs and behaviour

Article	Clinical behaviour	SDM behaviour	β			R^2
			Intention	Perceived behavioural control	Others	
Bernaix	Providing (technical, emotional, informational) in-hospital support to breastfeeding mothers	Discuss pros/cons Patient values/preferences Knowledge/recommendation Check/clarify understanding Present evidence	Not included in final model (not significant)	Not tested in stepwise analysis	Knowledge (β not presented)* Attitude (β not presented)* Subjective norm Nurses' personal breastfeeding experience Ethnicity Type of basic nursing education	0.56
Bernaix	Providing mothers with lactation support	Define/explain problem Discuss pros/cons Knowledge/recommendations Present evidence	Theory was not used to assess constructs of behaviour performance			
Eccles	Disclosing a diagnosis of dementia; (1) finding out what the patient already knows/suspects about their diagnosis; (2) using the actual words 'dementia' or 'Alzheimer's disease'; (3) exploring what the diagnosis means to the patient	Check/clarify understanding	Theory was not used to assess constructs of behaviour performance			
Jones	Recommending physical activity to cancer patients	Knowledge/recommendations	0.45***	0.08	Attitude 0.02	0.28
Millstein	Educating adolescent patients about the transmission of HIV and other STDs	Knowledge/recommendations Present evidence	0.49**	0.36**	Subjective norm 0.10 Subjective norm 0.19**	0.39
Sassen	Encouraging physical activity in patients with cardiovascular risk factors	Knowledge/recommendations	0.311***	Not included in final model (not significant)	Attitude 0.05 Habit 0.163* Barriers -0.239***	0.29

* $P < 0.05$.** $P < 0.01$.*** $P < 0.001$.

variance of behaviour varied between 0.28 and 0.56.

Discussion

We identified 20 studies across five countries that examined health professionals' intention and/or performance of SDM behaviours using the TPB, the TRA, or explicit extensions of these models. These studies surveyed 29 clinical behaviours which were mapped to SDM behaviours as described by Makoul & Clayman.³⁰ The SDM behaviours most often assessed were 'sharing knowledge and making recommendations,' 'clarifying the patient's values and preferences' and 'presenting evidence.' The theory-based variables most often identified as determinants of a professional's intention to engage in SDM-related behaviours were (in order of frequency) subjective norm, perceived behavioural control and attitude. The most predictive variable of a professional's performance of a SDM behaviour was intention. Many authors used the TPB as a basis for developing their own conceptual framework but incorporated elements of other theories. These results lead us to draw three main conclusions regarding the state of the research on SDM using the TPB.

First, the theory-based construct most frequently associated with intention was subjective norm. This contrasts with an earlier systematic review showing that among all health behaviours in health professionals, perceived behavioural control was the variable most often associated with intention.¹⁹ We hypothesize that the difference in our results is due to the interpersonal nature of SDM, which shifts the focus of a clinical encounter from the pathology to the patient.^{1,62} The subjective norm refers to the influence of the immediate social environment of the professional, that is, the opinions of 'people important to you.' This construct can refer to the professional's peers, mentors or licensing bodies, but in the case of SDM, the influence of the patient is also included in the construct. As the relationship formed between the health professional and the

patient is the most fundamental unit of decision making, this interpersonal and interdependent rapport may explain why the subjective norm comes up as the most frequent determinant of intention.^{63–65} Whilst the interpersonal nature of SDM plays a determining role in the intention to engage in SDM behaviours, the contemporary shift to patient-centred care in health policy may also be a factor in the role of the subjective norm.^{66,67} Indeed, private and public entities are making shared decision making a more intrinsic part of their funding priorities and policy development strategies,⁶⁸ which contribute to health professionals experiencing new social pressures to engage in SDM behaviours. This conclusion is consistent with a recent study that showed that intention to engage in SDM behaviours is most effectively changed by implementations that target subjective norm and perceived behavioural control.⁶⁹ It is worth noting that even if a health professional knows about options and best available evidence, the translation of such knowledge is often halted by other factors,^{70–72} and therefore interventions that focus on reinforcing the subjective norm of health professionals may help in tailoring care to the patient. This has strong implications for the design of SDM interventions, as it shows that addressing the interpersonal aspects of SDM may be an effective way to change professionals' behavioural intention to engage in SDM behaviours.

Second, across multiple clinical behaviours, we found that 'sharing knowledge and making recommendations' is the SDM behaviour most often studied using the TPB and/or the TRA. This should be interpreted with caution, as this behaviour is associated with a paternalistic model of clinical encounter rather than one based on patient-centred care. This is especially of concern when clinicians' recommendations may act to deter the patient from their preferred course of treatment.^{73,74} SDM is rooted in knowing about options *and* clarifying what is important to the patient, and a balance between both is ideal. The fact that the third most often-assessed SDM-related element is 'presenting evidence' may also reflect an enduring

paternalistic model of clinical decision making, and attention is required to discern when the presentation of evidence is used as a means to make the patient understand the doctor's recommendation and when it is used to help the patient understand their treatment options. SDM requires a multitude of considerations within the clinical encounter.⁶⁴ Recommending a treatment course and presenting evidence are behaviours at the core of SDM, but they do not suffice to qualify a decision-making process as truly shared. Therefore, the study of independent SDM behaviours fails to predict health professionals' behavioural intention or performance of SDM, which requires the simultaneous application of all SDM behaviours to be complete. Hence our psychosocial variables should not be interpreted as the determinants of SDM as a whole, but as determinants of the specific SDM behaviour(s) assessed as mapped in Table 2. Deferring the decision or arranging a follow-up were never evaluated using the TPB and/or the TRA. Whilst follow-up may be unproductive when SDM results in a clear and immediate decision, decision deferral pertains to situations in which the decision must be weighed for a long time and requires a thorough evaluation of patient preferences. Three of the four studies that focused on SDM captured the most SDM behaviours ($n \geq 7$ SDM behaviours).^{54,55,58} The other study⁴⁷ examined two SDM behaviours, referring specifically to elements from Makoul & Clayman's integrative model. Unless specifying otherwise, SDM-focussed studies appear to examine multiple SDM behaviours at once. As recommended by the theory, the results are relevant to the individual components of SDM (i.e. SDM behaviours) rather than to SDM as a whole.³³

Third, we found great heterogeneity in the way that the theory was applied to the assessment of behavioural intentions or behaviours. Indeed, 73% of the regression analyses performed to assess behavioural intention and 100% of the regression analyses performed to assess behaviour included other constructs than the ones originally included in the theory. It is important to tailor the theory to the context at

hand, since research suggests that a wide array of psychosocial constructs are important in the prediction of behavioural intention and behaviour,^{19,75,76} but this variety creates an interesting challenge for meta-analytic interpretation. However, given the success of TPB and the extent to which it predicts intention and behaviour, we suggest that it is an appropriate model to start from when designing interventions, but that the addition of salient beliefs to questionnaires may be necessary for including all relevant variables pertaining to the behaviour under study.^{25,77} Given the extent to which the variables and the behaviours differ, as well as the study types, the heterogeneity of the data does not lend itself to meta-analysis.⁷⁸

Limitations

In spite of the scope of our research strategy, it is possible that we missed some relevant studies. However, this limitation was mitigated by the verification of a wide range of systematic reviews.^{16,17,34–38} Another limitation was our difficulty in discerning which clinical behaviours should be mapped to which SDM behaviour. As confirmed by our relatively good kappa coefficient, the widely used definition of Makoul & Clayman helped us to decipher what was relevant and what was not. However, choosing what qualifies as an SDM behaviour still remains a subjective decision, and possibly always will. This limitation was reduced through thorough discussion and independent inclusion rounds. Finally, we found that a majority of studies did not include the term 'shared decision making,' indicating that the theory has been used to study many SDM behaviours, but not the SDM approach as such. We found four studies that assessed clinical behaviours using an SDM approach.^{47,54,55,58} This may suggest that our search strategy was too broad to capture explicitly SDM-based studies, but we deliberately broadened it because we were interested rather in understanding the variety of psychosocial variables involved in engaging in SDM behaviours. Consequently, although the other 16 studies did not focus on SDM as such, they

are still interesting and relevant to SDM research because the study of certain SDM behaviours independently of others may provide valuable insight into ways to enhance their adoption by health professionals.^{28,79} Careful interpretation of the results is required, as these do not demonstrate the overall psychosocial variables associated with SDM as a whole, but rather with its constituent behaviours.

Conclusion

Given the complexity of such behaviours, the heterogeneity of psychosocial constructs and behaviours examined and the customized versions of cognitive theories found in many studies, thorough meta-analytical work cannot be done at this point. We identified 20 studies across five countries that examined health professionals' intention and/or performance of a SDM behaviour using the TPB, the TRA or explicit extensions of these models. 'Sharing knowledge and making recommendations' was the element of SDM most often observed, followed by 'clarifying the patient's values and preferences' and 'presenting evidence.' Subjective norm was the psychosocial variable most often reported as being associated with intention, which indicates the important interpersonal nature of SDM behaviours and signals a sea change in the paradigms guiding contemporary clinical practice. In spite of the demonstrated complexity of predicting SDM behaviours, these findings could offer a foundation for designing further theory-based interventions targeting SDM behaviour change.

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Conflict of interests

The authors declare they have no conflicts of interest.

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