

# **Multiple goals and time constraints: perceived impact on physicians' performance of evidence-based behaviours**

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## **Abstract**

### **Background**

Behavioural approaches to knowledge translation inform interventions to improve healthcare. However, such approaches often focus on a single behaviour without considering that health professionals perform multiple behaviours in pursuit of multiple goals in a given clinical context. In resource-limited consultations, performing these other goal-directed behaviours may influence optimal performance of a particular evidence-based behaviour. This study aimed to investigate whether a multiple goal-directed behaviour perspective might inform implementation research beyond single-behaviour approaches.

### **Methods**

We conducted theory-based semi-structured interviews with 12 general medical practitioners (GPs) in Scotland on their views regarding two focal clinical behaviours: a) providing physical activity (PA) advice and b) prescribing to reduce blood pressure (BP) to <140/80 mmHg, in consultations with patients with diabetes and persistent hypertension. Theory-based constructs investigated were: intention and control beliefs from the theory of planned behaviour, and perceived interfering and facilitating influence of other goal-directed behaviours performed in a diabetes consultation. We coded interview content into pre-specified theory-based constructs and organised codes into themes within each construct using thematic analysis.

### **Results**

Most GPs reported strong intention to prescribe to reduce BP but expressed reasons why they would not. Intention to provide PA advice was variable. Most GPs reported that time constraints and patient preference detrimentally affected their control over providing PA advice and prescribing to reduce BP, respectively. Most GPs perceived many of their other goal-directed behaviours as interfering with providing PA advice, while fewer GPs reported goal-directed behaviours that interfere with prescribing to reduce BP. Providing PA advice and prescribing to reduce BP were perceived to be facilitated by similar diabetes-related behaviours (e.g.

discussing cholesterol). While providing PA advice was perceived to be mainly facilitated by providing other lifestyle-related clinical advice (e.g. talking about weight), BP prescribing was reported as facilitated by pursuing on-going standard consultation-related goals (e.g. clearly structuring the consultation).

### **Conclusions**

GPs readily relate their other goal-directed behaviours with having a facilitating and interfering influence on their performance of particular evidence-based behaviours. This may have implications for advancing the theoretical development of behavioural approaches to implementation research beyond single-behaviour models.

## Background

Translation of research evidence into clinical practice remains a challenge [1, 2]. The behavioural sciences provide a number of well-developed, operationalised and tested models of human behaviour that generalise across contexts that can inform implementation research [3]. Among models with the best predictive utility is the Theory of Planned Behaviour (TPB) [4]. Applied to a healthcare professional context, the TPB has been used to predict behaviour [5], to evaluate change [6], to develop behaviour change interventions [3] and as a framework for qualitative investigation [7]. A core assumption of the TPB is that the two most important determinants of whether a health professional will perform any behaviour are how strongly they intend to and whether they feel they can (i.e. their perceived behavioural control). The model also specifies predictors whose effect on behaviour is mediated by the health professional's intention: what they think about the consequences of performing the behaviour (their attitude), their perception of other influential people's views about them performing it (their subjective norms), and, again, their perceived behavioural control. Underlying each of these three constructs are associated specific beliefs: behavioural (about the outcome of performing the behaviour), normative (about how important other people want them to act), and control beliefs (about factors that make it difficult or easy to perform the behaviour). Reviews of predictive prospective studies suggest that this model accounts relatively well for the variation in healthcare professional behaviour [5, 8]. However, the model is not without its critics [9, 10], and further theoretical development to inform implementation efforts seems warranted. For instance, there is a recognised need for development of behavioural theories to better understand and promote health professionals' efficient uptake of guideline recommendations [1].

As with most quality improvement research, most (though not all [11]) applications of the TPB isolate behaviours from the wider context of multiple behaviours and multiple goals pursued. To the best of our knowledge, none of the studies in systematic reviews of tests of

social cognition models with health professionals [5, 12] considered whether performing multiple behaviours influenced a focal behaviour of interest. Investigating the influence of performing multiple goal-directed behaviours may help to better understand the performance of a particular evidenced behaviour, thereby potentially improving the TPB's utility. This study therefore aimed to a) identify whether GPs attribute their performance of a particular evidence-based behaviour as being influenced by other goal-directed behaviours they perform in a consultation, and b) assess whether this augments the information provided by single-behaviour approaches.

### **Interference and facilitation between healthcare delivery goal-directed behaviours**

Competing demands may affect the delivery of evidence-based diabetes healthcare [13]. For instance, lack of time due to competing demands is a frequently identified barrier to implementing guideline recommendations [14, 15]. Duration of consultations with GPs in the UK is limited to an average of 9.4 minutes [16]. This constraint might result in a GP wanting to perform a number of goal-directed behaviours in a consultation, but being unable to perform them all. Sources of competing demands in clinical consultations often include patient, physician, and contextual factors [17]. Competing demands can be viewed as the behaviours performed by the GP to pursue their goals for the consultation; their goal-directed behaviours. This approach views the GPs in an active role whose performance of a particular (evidence-based) behaviour is a function of what else they want to and do perform in the consultation. A clinical consultation can therefore be conceptualised as a system of goal-directed behaviours that a GP performs in order to pursue the goals they need and/or want to achieve to provide optimal patient care, which all compete for the limited resources available. For example, a GP may have an agenda when going into a diabetes consultation that includes a) measure blood pressure, b) increase dosage of ACE-Inhibitor to reduce blood pressure, c) prescribe a statin, d) measure foot pulses, e) provide advice on diet and exercise, f) discuss risks, g) address issues that the patient

may bring in, h) finish on time, amongst others. Each of these goal-directed behaviours competes for the limited time available.

Limited resources lead to three potentially overlapping relationships between goal-directed behaviours [18]: pursuing one goal may a) *interfere* with pursuing another, either by accounting for time available or due to an incompatibility (e.g. checking lipids and prescribing statins in response to test results are incompatible goals for a particular consultation because blood tests are not instantaneous), b) *facilitate* pursuing another, either instrumentally (e.g. providing dietary advice for weight loss can lead to providing exercise advice) or due to overlapping means (e.g. prescribing an ACE-inhibitor pursues the goals of achieving a contract target and lowering blood pressure), or c) be *independent* of pursuing another (which is less likely in resource-constrained settings).

Goal interference has been related to performance in a number of professional contexts, including management settings [19], call-centres [20], and with university academics [21], though its effect on performance of health behaviours such as exercise is not as clear [18, 22]. Goal facilitation has received comparatively less research attention, though a prospective correlational study found that facilitating goals predicted variance in health behaviour [18]. Tools such as personal projects analysis [23] provide a replicable methodology for eliciting personally salient multiple goal-directed behaviours and assessing their perceived influence on performance of a particular goal-directed behaviour in a particular context [24]. Incorporating the role of competing goal-directed behaviours in a diabetes consultation is a new approach which may inform single-behaviour operationalisations of behavioural models such as the TPB and may provide a useful way of augmenting these models.

### **Physical activity and blood pressure control in the diabetes consultation**

Tight blood pressure control and physical activity can reduce the risk of developing diabetes-related complications [25, 26]. However many people with diabetes do not meet recommended

blood pressure and physical activity levels. In Scotland, 74% of women and 58% of men with type 2 diabetes engage in less than 30 minutes of moderate to vigorous physical activity per week, compared to 41% of women and 36% of men without type 2 diabetes [27]. Primary care physicians are recognised as being at the front-line of diabetes management [28]. However patient surveys found that only half of patients with diabetes received exercise advice in their last visit to the GP [29], and three quarters reported having ever received exercise advice from a healthcare professional [30]. In the UK, an incentive structure is built into the contract of GPs, which remunerates for achieving predefined quality targets [31], known as Quality and Outcomes Framework (QOF) points. QOF data collected in primary care practices in the north-east of Scotland showed that a mean of 77.8% (standard deviation 7.7%) of people with diabetes achieved a BP of  $\leq 145/85$ mmHg (the Scottish audit standard, which is higher than current UK guideline recommendations of  $<140/80$ mmHg) [32]. However, between-practice variation ranged from 59.5% to 100% of patients. Thus, despite evidence-based guideline recommendations detailing effective pharmacological means of reducing blood pressure to evidenced targets [33-35] and providing physical activity advice in primary care [36, 37], implementation remains sub-optimal. Better implementation of the evidence in these guideline recommendations could have important implications for risk reduction.

Drawing upon existing theory and methods from the behavioural sciences, this study represents a preliminary stage in a series of studies aiming to investigate how competing goal-directed behaviours influence health professionals' evidence-based motivation and action.

## Methods

### Sampling and recruitment procedures

We recruited a diversity sample of 12 GPs from ten practices in NHS Grampian (Scotland) to represent variation in gender, age and rural/urban practice. Diversity sampling was used so that a variety of views could be studied. Fourteen GPs were informally contacted via email; twelve

indicated their interest in participating and were subsequently formally invited via email or telephone within one week of the initial approach to arrange a time and location for being interviewed. Pragmatic sample size considerations were made on the basis of advice from Guest, Bunce, and Johnson, who found that they developed 92% of codes within the first 12 (of 60) interviews conducted [38].

### **Data collection procedure**

Semi-structured one-to-one interviews investigated factors that GP's perceived facilitate and hinder their performance of two particular behaviours within the diabetes consultation they are most involved in: (a) provision of physical activity advice and (b) prescription of anti-hypertensive medication to those with persistent high blood pressure to control it to evidence-based guideline levels of <140/80 mmHg. Interviews were preferred over other methods as they provided the best fit with the theory-development research questions, allowing us to prompt participants for further elaboration. The interview topic guide was piloted with one GP, and amended subsequent to piloting and throughout the study to maximise content and feasibility within the target time (30 minutes). Interviews lasted on average 31 minutes (range = 21 to 53 minutes), and all (except one phone interview) were conducted face-to-face either in an office at each general practice or else at a pre-arranged alternative location if requested. Upon obtaining signed consent from participating GPs, interviews were digitally recorded. All interviews were conducted by JP from 19 March to 30 July 2008.

### **Analysis**

Interviews were transcribed verbatim and then content analysed by JP using N-Vivo 7. We defined a coding scheme a-priori based on the theory-based constructs of interest (i.e., control beliefs, intention, goal facilitation, and goal interference). Self-reported past behaviour was included to identify the extent to which these behaviours were performed. Construct definitions

used for coding followed advice and examples from the literature [39-41]. Content relating to each theory-based construct was identified and coded from each interview by JP, then organised into representative sub-themes for each theory-based construct using thematic analysis [42]. Analysis of the content within each sub-theme was reviewed by a practising GP (NCC) who independently organised the coded content for each construct into representative sub-themes. Disagreements were resolved by discussion.

### **Inter-rater reliability**

Three independent researchers double-coded the transcripts to assess the inter-rater reliability of coding for control beliefs, goal interference, and goal facilitation. Each double-coder was assigned a random sample of interview transcripts along with instruction materials and practice coding. We used an iterative double-coding procedure. In step 1, JP developed instruction materials and a practice sheet which an independent coder then used to code a random set of interview transcripts. Coding results were compared and discussed in depth throughout the double-coding procedure to clarify ambiguities or difficulties in the coding material instructions. Inter-rater reliability indices were not calculated at this step given the extent of discussion between the coder and JP. In step 2, we aimed to refine the instruction materials. A second coder was presented with the modified instruction materials and independently coded another random sample of transcripts from the remaining transcripts not yet double-coded. The coder and JP then compared coding and discussed discrepancies until a consensus was reached. Ambiguities in the instructions were discussed to further clarify the materials for the final double-coder. Inter-rater reliability at step 2 tested using Krippendorff's alpha [43] over all constructs was  $\alpha=0.72$  (95%CI 0.58-0.84). In step 3, we conducted a final double-coding using the refined instructions. A third independent coder was provided with another random set of transcripts to code, along with the finalised instructions. Discrepancies were discussed until a consensus was reached. In this final step, all constructs met the criterion for acceptable inter-rater reliability of

krippendorff's  $\alpha \geq .80$  [44]. Over all three constructs,  $\alpha=0.84$  (95%CI 0.68-0.96). For control beliefs,  $\alpha=0.86$  (95%CI 0.68-1.00), for goal conflict,  $\alpha=0.85$  (95%CI 0.39-1.00) and for goal facilitation,  $\alpha=0.82$  (95%CI 0.64-0.96).

### **Construct-specific coding**

#### ***Control beliefs***

Control beliefs were identified as any belief about factors or circumstances reported to make it a) easier, or b) difficult or impossible for GPs to perform the focal prescribing and advising behaviours. This was explicitly distinguished from behavioural beliefs, which focus on beliefs about the consequences of the behaviour, and normative beliefs, which focus on beliefs about which important other individuals or groups might approve of performing the behaviour or not [41].

#### ***Intention and past behaviour***

We coded the strength of the GP's intention and the proportion of their next five patients with whom they intended to perform each focal behaviour, as well as the number of their last five patients with whom GPs self-reported performing each focal behaviour. We considered attributions for why GPs did not pursue each focal goal with all of the last five patients, or intended to with all of their next five patients, as potential control beliefs, behavioural beliefs, or normative beliefs, as well as potential sources of goal interference or goal facilitation.

#### ***Goal facilitation and goal interference***

We identified and coded all the goals and behaviours that GPs reported as facilitating and/or interfering with performing the two target behaviours. Both explicit and coder-inferred goal interference and facilitation were coded. Goal facilitation was defined as any behaviour performed or goal pursued by the GP which either helpfully led to or had overlapping attainment

strategies with the two target behaviours. Goal interference was defined as any behaviour performed or goal pursued by the GP which hindered or made it less likely that they would perform the two target behaviours.

## Results

### Participants

The 12 participating GPs' ages ranged from 29 to 50 years (mean = 40.3 years), and five were women. Half of GPs had an affiliation with a university, and half practised in a rural setting. Graduation year ranged from 1981 to 2003 (median = 1989.5). QOF data from 2007/2008 for the percentage of patients with diabetes reaching a blood pressure target of  $\leq 145/85$  mmHg indicated that participants' practices achieved this target with 75.60% (range greater than 20%) of their patients [32]. Six GPs reported aiming for a BP guideline target of  $\leq 140/80$  mmHg, four reported aiming for the QOF target of  $\leq 145/85$  mmHg, two reported aiming for a range rather than a specific target, and one GP reported prescribing until lost compliance or side effects.

### Past behaviour

There was considerable variation in GP's self-reported provision of physical activity (PA) advice with their last five patients with diabetes with persistent hypertension, ranging from "Probably none – JP005, male, 43, rural" to "At least three out of five I would say – JP013, male, 41, urban" through to "I would say all of them actually, in different degrees – JP012, female, 34, rural". GPs reported providing PA advice to a median of 2 out of their last 5 patients with diabetes with persistent hypertension (range 0 to 5 patients). GPs reported prescribing to reduce blood pressure with a median of 2.25 of their last 5 patients (range 0 to 4). Reports ranged from "I think the last 5 patients, probably none actually – JP011, female, 29, rural", through to "I would say about four out of five – JP019, male, 50, urban".

### Intention

Strength of intention to provide PA advice ranged between GPs from strong (“I think it’s quite a strong intention – JP010, female, 35, urban”, “It’s relatively strong – JP018, male, 47, rural”) to weak (“Fairly low I think, fairly low – JP019, male, 50, urban”). GPs reported intending to give PA advice to a median of 2.5 out of their next 5 patients (range 1.5 to 4), though one GP said “almost none – JP005, male, 43, rural” and another indicated “If they are all overweight I would say it to all of them – JP020, female, 30, rural”. Strength of intention to prescribe to reduce blood pressure was generally strong, but also depended upon other factors: “so your intention is quite strong but there are so many other things that have to come into play – JP010, female, 35, urban”, “Well, just that you would [intend]. [...] I definitely couldn’t blanket say what I do with a group of patients as a whole – JP011, female, 29, rural”, “Well it depends on the class of drug they are already on – JP017, male, 42, urban”. GPs reported intending to prescribe to a median of 4.5 of their next 5 patients (range=1 to 5). One GP mentioned “I think that’s very difficult to say because it’s totally on an individual basis – JP12, female, 34, rural”.

### Control beliefs

We grouped control-related factors that GPs reported as making it easier or difficult for them to provide PA advice and prescribe to reduce BP into categories representative of similar content [See Additional File 1]. All 12 GPs mentioned at least one control belief. Most GPs reported that *consultation* factors and in particular that time-related pressures (mentioned by 8 GPs) impeded their control over providing physical activity advice. For prescribing to reduce blood pressure however, ‘time pressures’ was highlighted by only 3 GPs. Most GPs reported that *patient* factors, namely patient preference for not wanting medication (mentioned by 8 GPs), made it difficult for them to prescribe. Half reported that *patient* factors (i.e. patient interest and patient triggering the GP) made it easier for them to provide physical activity advice, though *consultation* factors (in particular ‘having time’ – 3 GPs) were also mentioned. For prescribing

to reduce BP, *patient* factors were described as making it easier for GPs to prescribe, and in particular whether the patient is informed/understands the importance of blood pressure in their diabetes management (5 GPs). *Consultation* factors such as having time to discuss blood pressure (3 GPs) and having continuity of care (3 GPs) were also seen as making it easier to prescribe. Overall, while GPs had relatively higher intention to prescribe than to give advice, BP prescribing was associated with more control beliefs.

### **Goal interference**

Table 1 shows that ten participants mentioned goal-directed behaviours that they perceived as interfering with providing PA advice, and 7 GPs mentioned goal-directed behaviours perceived to interfere with prescribing to reduce blood pressure. Three participants mentioned that pursuing contract targets (i.e. related to the Quality and Outcomes Framework) interfered with providing PA advice (“it’s the danger of targets and that they focus you on the targets which is their point, but it focuses you away from the non-targeted activities – JP019, male, 50, urban”). More GPs perceived that goal-directed behaviours related to the *consultation* in general interfered with providing PA advice than prescribing to reduce BP. Furthermore, the goal-directed behaviours perceived to interfere with PA advice had a pervasive quality (e.g. other priorities “I think it’s been squeezed out by everything else – JP005, male, 43, rural”; “the nature of the beast is that I’ve got 3 things to cover here that need to be covered, and it takes less priority – JP010, female, 35, urban”). Conversely, the consultation goal-directed behaviours perceived as interfering with prescribing to reduce BP were more transient (e.g. “we need to capture a certain core of information for contract so if it was kind of much last time we’re going to see this patient this year, we’ve got to do blood screening and blood pressure treatment would probably be deferred until April or May – JP014, male, 35, urban”; “I think the last 5 patients, probably none of them actually because I think it’s all been patients with colds or I’ve seen them as a one-off – JP011, female, 29, rural”).

Participants perceived goal-directed behaviours specifically related to *diabetes* as interfering with both target behaviours, though more participants mentioned this as an issue for providing PA advice. While idiosyncratic, the goals of ‘not wanting to be a broken record (JP013, male, 41, urban)’ and ‘wanting to go home in time for dinner (JP005, male, 43, rural)’ highlight that GPs’ personal goals can also potentially interfere with providing PA advice in the consultation.

### **Goal facilitation**

Table 2 shows that eleven of 12 participants mentioned goal-directed behaviours perceived to facilitate providing PA advice and prescribing to reduce BP in a consultation. These target behaviours were mentioned by participants as facilitating each other to a certain extent (“it’s difficult to just look at blood pressure without looking at physical activity, these sorts of things [happen] at the same time” – JP011, female, 29, rural). Providing PA advice was perceived to be facilitated by discussing other lifestyle issues (particularly, ‘weight discussions’ was mentioned by seven of 11 GPs) and addressing diabetes-related risks for future health. Prescribing to reduce BP was perceived to be mainly facilitated by performing on-going consultation goal-directed behaviours (e.g. clearly structuring the consultation, trying to reach QOF targets, negotiating with the patient).

### **Prospective facilitation**

While this study focused on facilitating goal-directed behaviours within a specific consultation, participants also described goal-directed behaviours that prospectively facilitated performance of the focal behaviours. Nine of 12 GPs mentioned goal-directed behaviours that they performed over many consultations that eventually facilitated prescribing to reduce blood pressure: building rapport, establishing shared or GP-led nature of consultation, giving opportunity to try lifestyle options first, recommending a home BP monitor, tailoring guidelines, using staged

prescription of different drugs, providing written information, GP writing self reminders, inviting patients who are not at maximum tolerated dosage in for a review, and taking multiple blood pressure readings. For providing physical activity advice, fewer GPs (4 of 12) mentioned comparatively less goal-directed behaviours that prospectively facilitated providing PA advice. These included empowering the patient (e.g. “really empowering the patient themselves to take a bit more responsibility for their own health and condition – JP012, female, 34, rural”), making another appointment with the GP, and making an appointment with the nurse.

## Discussion

### Main findings

This study used theory-based constructs informed by a multiple goal-directed behaviour approach to explore whether and how GPs perceived that their other goal-directed behaviours affected their performance of two particular evidence-based behaviours. Results show that indeed GPs perceived other goal-directed behaviours as interfering with and facilitating performing the evidence-based behaviours. This is in line with previous research conducted with other populations that found that the interfering [19-22] and facilitating [39] effect of other goal pursuits were related to the performance of a particular behaviour. This study builds on this research by providing evidence that the perceived relationships between performing multiple goal-directed behaviours in a clinical consultation can usefully augment single-behaviour models such as the TPB to reflect the competing demands in clinical practice.

### Extent and duration of perceived goal interference

The extent of perceived interference of participants’ other goal-directed behaviours varied considerably between both focal behaviours. Providing PA advice was perceived by many to be interfered with by much of the rest of the goal-directed behaviours in the consultation, which may account for the relatively weaker intentions expressed towards providing PA advice. This is

suggestive that interfering goal-directed behaviours might be negatively associated with intention. Nevertheless, participants also mentioned goal-directed behaviours that interfered with prescribing to reduce blood pressure despite the strong expressed intention, which suggests a direct association with behaviour. The implication for theory is that goal interference may be associated with both intention and behaviour, and particularly that it may moderate the relationship between them. Furthermore, while results found time pressures to be the main control-related barrier to providing PA advice, the source of these time pressures is usefully described as the other goal-directed behaviours identified as interfering with PA advice. For prescribing to reduce BP, the perceived interference of 'providing patient choice' and 'respecting patient preference' may indicate why 'patient preference' was reported most frequently as a barrier to prescribing to reduce BP. GPs' perceived control over prescribing to reduce blood pressure may be undermined by their pursuit of the goals of 'provide patient choice' and 'respect patient preference'. It is not the aim of this study to evaluate the appropriateness of the goals GPs pursue; rather, this study demonstrates that the goal interference construct allows us to identify a potential source of the identified difficulty of performing the target behaviour.

The nature of the goal-directed behaviours described as interfering with each focal behaviour suggests that goal interference may have a temporal dimension. Relatively more longitudinal goal-directed behaviours (i.e. that can be performed frequently and enduringly over time) were perceived to interfere with providing PA advice than prescribing to reduce BP. Furthermore, of the three types that were perceived to interfere with BP prescribing, those related to the consultation in general and diabetes specifically were most frequently mentioned but were more transient in nature (see Table 1). This transient interference was mainly confined to a single consultation (e.g. capturing other contract information at the end of the contract year), which could conceivably be addressed by deferring blood pressure prescribing to the next consultation.

Indeed, whereas transient interference can be dealt with using deferral strategies [45], enduring interference is by definition longitudinal in nature and thus continuous deferral would likely be detrimental. Enduringly interfering goal pursuits may be more of an indication of the relative priority of a goal-directed behaviour; if many goals interfere over a long period of time with performing a particular behaviour, the latter may not be seen as important or useful. Enduring interference may be particularly problematic for optimal performance of evidence based behaviours, and future research could specifically identify whether duration of perceived interference affects performance of particular focal behaviours.

### **Extent and duration of perceived goal facilitation**

It may be telling that half of GPs perceived that goal-directed behaviours related to the consultation in general facilitate prescribing to reduce BP whereas only 1 GP mentioned such a behaviour ('taking a history') as facilitating providing PA advice. The numerous goal-directed behaviours related to the consultation in general that were perceived to facilitate prescribing to reduce BP suggests that the context of the consultation may in some cases be organised to facilitate performing this behaviour more so than giving PA advice. Conversely, PA advice was perceived to be mainly facilitated by other lifestyle-related advice or discussions relating to diabetes, thus further highlighting the lack of facilitating consultation-related goal-directed behaviours. This coupled with the relatively fewer facilitating consultation-related goal-directed behaviours suggests an underlying difference in priority between the two focal behaviours.

Some participants perceived that providing PA advice and prescribing to reduce BP facilitated each other. However, the varying levels of intention to give PA advice compared to overall strong intentions to prescribe to reduce BP suggest that when time is limited, the behaviour with the relatively stronger intention may prevail. Promoting facilitating relations may therefore depend on whether the opportunity to pursue both goals presents itself or is planned for a priori.

Despite the interview focusing on goal relations within a single consultation, the longitudinal and chronic nature of diabetes care was often reflected in GPs' responses. When discussing facilitating goal-directed behaviours, many GPs described pursuing one goal over a series of consultations which eventually facilitated performing the focal behaviour. While this lead-up prospective facilitation is reminiscent of proximal subgoals [46] and instrumental acts [47] the latter are nevertheless framed within a single-behaviour perspective. Conversely, prospective goal facilitation takes an expressly systems-based perspective wherein the component goal-directed behaviours that facilitate each other are of value and performed in and of themselves. This wider perspective may help to account for the longitudinal aspects of general practice often recognised as a main advantage, such as continuity of care [48].

### **Relative priority between goal-directed behaviours**

In this study, despite more barriers expressed for prescribing to reduce BP, GPs reported having a stronger intention to prescribe than to give PA advice, suggesting higher relative priority.

Furthermore, a number of goal-directed behaviours were identified as both interfering with and facilitating the focal behaviours (e.g. trying to reach QOF targets, addressing cholesterol). The effectiveness of strategies for dealing with interference and promoting facilitation may ultimately depend on which goal-directed behaviours are prioritised at any given time.

Identifying the determinants of this priority is beyond the scope of this study, but given that BP prescribing is currently a QOF-remunerated target while PA advice is not seems a likely reason for differences in relative priority. In a null-sum situation of limited time something must give way, and this is likely determined by the perceived priority of each goal-directed behaviour.

However, applications of single behaviour models to health professional behaviour [5, 12] inherently do not consider this. A GP may intend to address a) cholesterol and b) blood pressure with a patient and defer addressing BP to the next consultation in order to be able to pursue

both. However, this still raises the question of which behaviour should take precedence and which should be deferred. When follow up consultations or extra time slots [49] are readily available, this may be less of an issue. However, the follow-up consultation also presents with another set of goal-directed behaviours themselves potentially interfering with the now deferred behaviour. Whether or not the deferred behaviour's priority has changed may again be a function of what other goal-directed behaviours the GP performs in the follow-up consultation. Future research should examine how promoting the facilitating goal pursuits and reducing the effect of interfering goals might affect performance of a target behaviour, and whether this effect depends on the focal behaviour's relative priority either generally or in situ.

### **Practical implications for future research**

The methods associated with eliciting the multiple goal-directed behaviours that professionals perform and assessing their perceived interfering and facilitating influence on a focal behaviour may provide a basis for intervention. By raising the awareness and salience of perhaps otherwise habitually performed behaviours such an intervention could provide the opportunity to target interfering goal relations that may be related to identified control-related barriers (e.g. time pressures and patient preference in this study). Once this interference is identified (and if appropriate), strategies can be adopted to minimise its effects. For instance, in this study GPs reported that respecting patient choice interfered with prescribing to reduce blood pressure (Table 1 goal interference) and that whether the patient 'understands and is informed' made it easier to prescribe (Additional File 1 control beliefs). They also perceived that performing the goal-directed behaviour of 'educating patients' facilitated prescribing to reduce BP (Table 2 goal facilitation). Thus, a strategy of educating patients may both facilitate performance of the target behaviour and promote the factors seen as making it easier to prescribe to reduce BP.

Prospective facilitation may provide another effective way of mitigating some of the control belief-related difficulties and goal interferences raised by GPs for each focal behaviour. By identifying prospectively facilitating goal-directed behaviours and prospectively planning their performance over time may provide a theoretically-informed operationalisation of continuity of care.

### **Utility of multiple goal-directed behaviours approach for addressing gaps in care**

This study suggests that what GPs do and pursue during a consultation relate to each other in a helpful or hindering way. Behaviours are not performed in isolation of the rest of the clinical context. Gaps between research evidence and the performance of a particular clinical behaviour may be addressed by focusing attention upon what else the GP wants to do and does during the consultation, and how they relate to the focal behaviour. In some instances, such as for providing physical activity advice, many of the other goal-directed behaviours in the consultation are perceived to interfere with its performance. For others such as prescribing behaviours, the extent of interference is lesser (perhaps due to a higher relative priority). However, optimal behaviour is still marred by a number of identified control-related barriers. In such instances, the value of the multiple goal-directed behaviour approach may be as a means of identifying sustainable goal pursuits that facilitate prescribing while simultaneously addressing identified barriers. The findings of this qualitative study suggest that further study of these potential effects is warranted using predictive and experimental methods.

### **Strengths and limitations**

This study used an explicit and a priori-specified theory-based methodology as a foundation for thematic analysis. As the aims of this study were expressly towards theory development, this approach is a particular strength of this study. This study integrated knowledge and evidence from existing theories to extend current ones, rather than (re)inventing a new theory [50]. By

moving beyond single behaviours studied in isolation, this study attempted to bring some clarity to the complexity of clinical practice. The theory-based methods used support the results in contributing to building a cumulative evidence base of the implementation of health professional behaviour. Methodologically, the double coding and inter-rater reliability assessment are also a strength. While this study is limited by the small sample size used, this is mitigated by the diversity sampling strategy used to explore the breadth of responses, and evidence from the literature suggesting that a sample size of 12 can provide as much information as a much larger sample in qualitative studies[38].

### **Unanswered Questions**

Distinguishing priority from constructs such as relative intention is beyond the scope of this study. Future research should measure both intention and priority and assess their inter-relation. However, intention and priority can be distinguished conceptually. It is plausible to have a high intention to do something but not have it as a high priority. Priority implies urgency, and thus priority judgements necessarily involve a comparison to other behaviours and are therefore inherently relative in nature. Another unanswered question involves GPs' reports of high intention to prescribe to reduce BP, but expressing conditions that affect that high intention. Future research should investigate the implication of these conditionalities. Finally, this study implies that facilitation and interference of goals may add to the understanding of behaviour in the clinical context over and above intentions and perceived behavioural control [5, 12]. Future research is needed to test if this approach actually improves prediction and modification of clinical behaviours and if so, if it adds independently to the TPB constructs or if facilitation/interference may moderate the relationship between clinicians' intentions and their behaviour.

## **Conclusions**

GPs perceive their other goal-directed behaviours as influencing the performance of particular focal behaviours. This hypothesis-generating result suggests that behavioural approaches to knowledge translation may benefit from further investigation of whether multiple goal-directed behaviour approaches can predict and explain variation in behaviour beyond single-behaviour models.

## **Ethical approval**

Ethical approval for this study was obtained by the North of Scotland Research Ethics Committee.

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## **Competing interests**

None declared.

## **Authors' contributions**

JP, FFS, JJF and NCC conceived and designed the study. JP carried out the interviews, conducted analyses and wrote the manuscript. All authors edited, revised and approved the final manuscript.

## References

1. Grimshaw JM, Thomas RE, MacLennan G, Fraser C, Ramsay CR, Vale L, Whitty P, Eccles MP, Matowe L, Shirran L, Wensing M, Dijkstra R, Donaldson C: **Effectiveness and efficiency of guideline dissemination and implementation strategies.** Health Technology Assessment 2004, **8**:1-72.
2. Grol R, Grimshaw J: **From best evidence to best practice: effective implementation of change in patients' care.** Lancet 2003, **362**:1225-1230.
3. Hrisos S, Eccles MP, Johnston M, Francis JF, Kaner EFS, Steen IN, Grimshaw J: **An intervention modelling experiment to change GPs' intentions to implement evidence-based practice: Using theory-based interventions to promote GP management of upper respiratory tract infection without prescribing antibiotics.** BMC Health Services Research 2008, **8**:10.
4. Ajzen I: **The theory of planned behavior.** Organizational behavior and human decision processes 1991, **50**:179-211.
5. Godin G, Belanger-Gravel A, Eccles M, Grimshaw J: **Healthcare professionals' intentions and behaviours: A systematic review of studies based on social cognitive theories.** Implementation Science 2008, **3**:36.
6. Grimshaw J, Zwarenstein M, Tetroe J, Godin G, Graham I, Lemyre L, Eccles M, Johnston M, Francis J, Hux J, O'Rourke K, Légaré F, Pesseau J: **Looking inside the black box: a theory-based process evaluation alongside a randomised controlled trial of printed educational materials (the Ontario printed educational message, OPEM) to improve referral and**

**prescribing practices in primary care in Ontario, Canada.** Implementation Science 2007, **2:38.**

7. Foy R, Walker A, Ramsay C, Penney G, Grimshaw J, Francis J: **Theory-based identification of barriers to quality improvement: induced abortion care.** International Journal for Quality in Health Care 2005, **17:147-155.**

8. Eccles MP, Hrisos S, Francis J, Kaner EF, Dickinson HO, Beyer F, Johnston M: **Do self-reported intentions predict clinicians' behaviour: a systematic review.** Implementation Science 2006, **1:28.**

9. Ogden J: **Some problems with social cognition models: A pragmatic and conceptual analysis.** Health Psychology 2003, **22:424-428.**

10. Sniehotta FF: **Towards a theory of intentional behaviour change: Plans, planning and self-regulation.** British Journal of Health Psychology 2009, **14:261-273.**

11. Cruickshank M, Francis J: **Choosing between health-related behaviours: Testing the utility of the TPB to predict intention choice.[abstract].** *Psychology & Health* 2008; **23:94.**

12. Eccles MP, Hrisos S, Francis J, Kaner EFS, Dickinson HO, Beyer F, Johnston M: **Do self-reported intentions predict clinicians' behaviour: A systematic review.** Implementation Science 2006, **1:28.**

13. Parchman ML, Romero RL, Pugh JA: **Encounters by patients with type 2 diabetes--complex and demanding: an observational study.** Annals of Family Medicine 2006, **4:40-45.**

14. Cabana MD, Rand CS, Powe NR, Wu AW, Wilson MH, Abboud PA, Rubin HR: **Why don't physicians follow clinical practice guidelines? A framework for improvement.** JAMA 1999, **282:1458-1465.**

15. Francke AL, Smit MC, de Veer AJ, Mistiaen P: **Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review.** BMC Medical Informatics & Decision Making 2008, **8**:38.
16. Deveugele M, Derese A, van den Brink-Muinen A, Bensing J, De Maeseneer J: **Consultation length in general practice: cross sectional study in six European countries.** BMJ 2002, **325**:472.
17. Jaen CR, Stange KC, Nutting PA: **Competing demands of primary care: a model for the delivery of clinical preventive services.** Journal of Family Practice 1994, **38**:166-174.
18. Riediger M, Freund AM: **Interference and facilitation among personal goals: Differential associations with subjective well-being and persistent goal pursuit.** Personality and Social Psychology Bulletin 2004, **30**:1511-1523.
19. Kehr HM: **Goal conflicts, attainment of new goals, and well-being among managers.** Journal of Occupational Health Psychology 2003, **8**:195-208.
20. Slocum JW, Cron WL, Brown SP: **The effect of goal conflict on performance.** Journal of Leadership & Organisational Studies 2002, **9**:77-89.
21. Locke EA, Smith KG, Erez M, Chah D: **The effects of intra-individual goal conflict on performance.** Journal of Management 1994, **20**:67-91.
22. Gebhardt WA, Maes S: **Competing personal goals and exercise behaviour.** Perceptual and Motor Skills 1998, **86**:755-759.
23. Little BR: **Personal projects: A rationale and method for investigation.** Environment and Behavior 1983, **15**:273-309.

24. Penseau J, Sniehotta FF, Francis JJ, Little BR: **Personal projects analysis: Opportunities and implications for multiple goal assessment, theoretical integration, and behaviour change.** European Health Psychologist 2008, **10**:32-36.
25. UK Prospective Diabetes Study Group: **Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38.** BMJ 1998, **317**:703-713.
26. Zinman B, Ruderman N, Campagne BN, Devlin JT, Schneider SH, American Diabetes A: **Physical activity/exercise and diabetes.** Diabetes care 2004, **27**(Suppl 1):S58-62.
27. Bromley C, Chaudhury M, Craig R, Deverill C, Erens B, Fuller E, Gray L, Herrick K, Hirani V, Kelly Y, Leyland A, MacGregor A, Moody A, Prescott A, Pickering K, Primatesta P, Scholes S, Shelton N, Speight S, Stamatakis E, Wardle H, Zaninotto P: **The Scottish Health Survey - 2003 Results.** 2005, :1-382.
28. Harris SB, Stewart M, Brown JB, Wetmore S, Faulds C, Webster-Bogaert S, Porter S: **Type 2 diabetes in family practice. Room for improvement.** Canadian Family Physician 2003, **49**:778-785.
29. Wee CC, McCarthy EP, Davis RB, Phillips RS: **Physician counseling about exercise.** JAMA 1999, **282**:1583-1588.
30. Morrato EH, Hill JO, Wyatt HR, Ghushchyan V, Sullivan PW: **Are health care professionals advising patients with diabetes or at risk for developing diabetes to exercise more?.** Diabetes care 2006, **29**:543-548.
31. Roland M: **Linking physicians' pay to the quality of care — A major experiment in the United Kingdom.** New England Journal of Medicine 2004, **351**:1448-1454.

32. **General Practice - Quality & Outcomes Framework 2007/08 Achievement data at practice level - individual indicator** [<http://www.isdscotland.org/isd/5734.html>]
33. National Institute for Health and Clinical Excellence: **Type 2 diabetes: the management of type 2 diabetes (update)**. 2008, **CG66**:1-44.
34. Scottish Intercollegiate Guidelines Network: **Management of diabetes: A national clinical guideline**. 2001, **55**:1-50.
35. American Diabetes Association: **Standards of medical care in diabetes--2007**. Diabetes care 2007, **30**:S4-S41.
36. National Institute for Health and Clinical Excellence: **Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling**. 2006, **PH002**:1-37.
37. Albright A, Franz M, Hornsby G, Kriska A, Marrero D, Ullrich I, Verity LS: **American College of Sports Medicine position stand. Exercise and type 2 diabetes**. Medicine & Science in Sports & Exercise 2000, **32**:1345-1360.
38. Guest G, Bunce A, Johnson L: **How many interviews are enough? An experiment with data saturation and variability**. Field Methods 2006, **18**:59-82.
39. Riediger M, Freund AM: **Interference and facilitation among personal goals: Differential associations with subjective well-being and persistent goal pursuit**. Personality and Social Psychology Bulletin 2004, **30**:1511-1523.
40. Riediger M: **On the dynamic relations among multiple goals: intergoal conflict and intergoal facilitation in younger and older adulthood**. 2001, :1-272.

41. Francis J, Eccles MP, Johnston M, Walker A, Grimshaw J, Foy R, Kaner EFS, Smith L, Bonetti D: **Constructing questionnaires based on the theory of planned behaviour: A manual for health services researchers.** 2004, :1-42.

42. Braun V, Clarke V: **Using thematic analysis in psychology.** *Qualitative Research in Psychology* 2006, **3**:77-101.

43. Hayes AF, Krippendorff K: **Answering the call for a standard reliability measure for coding data.** *Communication Methods and Measures* 2007, **1**:77-89.

44. Krippendorff K: **Reliability in content analysis: Some common misconceptions and recommendations.** *Human Communication Research* 2004, **30**:411-433.

45. Dodge KA, Asher SR, Parkhurst JT: **Social life as a goal-coordination task.** In *Research on motivation in education: Goals and cognitions. Volume 3.* Edited by Ames C, Ames R. San Diego, CA: Academic Press; 1989:107-135.

46. Bandura A, Schunk DH: **Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation.** *Journal of Personality and Social Psychology* 1981, **41**:586-598.

47. Bagozzi RP: **The self-regulation of attitudes, intentions, and behavior.** *Social Psychology Quarterly* 1992, **55**:178-204.

48. Gillies JCM, Mercer S, Lyon A, Scott M, Watt GCM: **Distilling the essence of general practice: a learning journey in progress.** *British Journal of General Practice* 2009, **May**:e167-e176.

49. Wilson AD, Childs S: **Effects of interventions aimed at changing the length of primary care physicians' consultation.** *Cochrane Database of Systematic Reviews* 2006, (1):1-20.

50. Eccles M, Grimshaw J, Walker A, Johnston M, Pitts N: **Response to "The OFF Theory of research utilization"**. 2005, **58**:117-118.

Table 1 - Goal-directed behaviours perceived to interfere with focal behaviours

Physical activity advice (N=10 GPs)		Blood pressure prescribing (N=7 GPs)	
<i>Theme</i>	<i>Goal-directed behaviours</i>	<i>Theme</i>	<i>Goal-directed behaviours</i>
Consultation (n=8)	<ul style="list-style-type: none"> <li>- fitting the patient agenda</li> <li>- focusing on contract-specific goals</li> <li>- treating acute illness</li> <li>- other clinical aspects (general)</li> </ul>	Consultation (n=4)	<ul style="list-style-type: none"> <li>- capturing other contract information</li> <li>- dealing with pressing issues</li> <li>- pursuing the contract BP targets</li> <li>- too much else going on in the consultation</li> <li>- treating acute illness</li> </ul>
Diabetes (n=4)	<ul style="list-style-type: none"> <li>- addressing medication</li> <li>- covering blood pressure and cholesterol</li> <li>- giving instruction for diabetic control</li> <li>- getting HbA1c down</li> <li>- looking at blood sugar</li> </ul>	Diabetes (n=2)	<ul style="list-style-type: none"> <li>- addressing cholesterol</li> <li>- multiple drugs to prescribe</li> <li>- talking about glycaemic control</li> </ul>
GP factors (n=2)	<ul style="list-style-type: none"> <li>- not wanting to be a broken record</li> <li>- wanting to go home</li> </ul>	GP/patient relationship (n=3)	<ul style="list-style-type: none"> <li>- providing patient choice</li> <li>- respecting patient preference</li> </ul>

Table 2 - Goal-directed behaviours perceived to facilitate focal behaviours

<b>Physical activity advice (N=11)</b>		<b>Blood pressure prescribing (N=11)</b>	
<i>Theme</i>	<i>Goal-directed behaviour</i>	<i>Theme</i>	<i>Goal-directed behaviour</i>
Consultation (n=1)	- Taking a history	Consultation (n=6)	- Clearly structuring the consultation
Diabetes (n=10)	- Addressing blood pressure		- Discussing diabetes as a whole
	- Addressing cholesterol	- Engaging the patient	
	- Addressing HbA1c	- Negotiating with the patient	
	- Discussing cardiovascular risk	- Advise patient to return if side effects	
	- Discussing sugar control	- Trying to reach QOF targets	
	- Discussing heart and kidney risks	Discussion about future health (n=5)	- Addressing HbA1C
Lifestyle (n=8)	- Addressing alcohol		- Addressing poor sugar control
	- Addressing smoking		- Discussing cholesterol
	- Asking about work		- Discussing reducing risks
	- Checking BMI		- Showing CV risk
	- Checking general fitness	Lifestyle (n=3)	- Exercise advice
	- Talking about weight		- Taking a holistic approach
	- Talking about diet		- Giving weight advice
	- Weighing the patient	Educating patient (n=4)	- Re: medication and side effects
Mental health (n=2)	- Addressing well-being		- Re: high blood pressure
	- Asking about low mood		- In general
	- Asking about stress		- Quoting guidelines
			- Showing results
		Prescribing (n=3)	- Choosing drugs with good side effects
			- Explaining options
			- Following guidelines
			- Planning prescribing options

## **Additional files**

### **Additional file 1 – Coded control beliefs for each focal behaviour (N=12)**

File name: Additional File 1 Control Beliefs.doc

**Additional files provided with this submission:**

Additional file 1: additional file 1 control beliefs.doc, 53K

<http://www.implementationscience.com/imedia/1115137239277780/supp1.doc>