

**Exploring Barriers Medical Residents and Established Physicians Face When Counselling  
Patients on Physical Activity By Stage of the Transtheoretical Model**

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**Word Count: 1499**

## **Exploring Barriers Medical Residents and Established Physicians Face When Counselling Patients on Physical Activity By Stage of the Transtheoretical Model**

Physical activity (PA) counselling by physicians increases patients' PA levels and improves health outcomes. Physician PA counselling remains low as a result several barriers which may differ based on a patient's stage within the Transtheoretical Model (TTM) or by physician career status (i.e. between residents and established physicians). A convenience sample of physicians in Ontario ( $N=38$ ,  $n=24$  residents) completed a cross-sectional, online survey assessing perception of barriers to PA counselling based on hypothetical patients' TTM stage of change. Compared with responses to other barriers, physicians agree less with feeling adequately reimbursed, having other professionals intervene, and having adequate resources for PA counselling. Based on responses to each barrier, physicians were more likely to counsel patients in the contemplation, preparation and action stages. Compared with established physicians, residents report less agreeance with being adequately reimbursed and having enough time for PA counselling, and greater agreeance with having other professionals intervene. This study communicates barriers that physicians encounter when counselling patients at different stages of PA behaviour change and the influence of career status on barrier experience. Developing patient-stage- and career-stage-specific PA counselling medical training, interventions and policy changes may enhance PA counselling among physicians, and ultimately patient PA behaviour and health outcomes.

**Keywords:** physical activity; physical activity counselling; transtheoretical model; medical education; primary care.

## **Introduction**

Regular physical activity (PA) is an effective prevention method for chronic disease (Warburton, 2006); however, 85% of Canadians are not acquiring enough PA to achieve health benefits (Colley et al., 2011; Tremblay et al., 2011). A promising strategy to increase PA levels is having physicians promote PA to their patients (Orrow, Kinmonth, Sanderson, & Sutton, 2013; Petrella & Lattanzio, 2002); however, promotion rates remain low despite effectiveness. A recent sample from Quebec found only 21.6% of patient interactions involve PA counselling (Baillot et al., 2018). Identifying strategies for closing this knowledge-to-practice gap requires a fulsome understanding of the barriers that physicians face when providing PA counselling (Graham et al., 2006).

Although existing research has evaluated barriers physicians face when counselling patients about PA (see Hébert et al., 2012), no research has stratified patient samples based on their readiness for engaging in PA behavior. Such stratification would detect potential heterogeneity in physicians' experience of barriers depending on patient characteristics (Pekmezi, Barbera, & Marcus, 2010).

Thus, the current study queried physicians' experience of barriers to PA counselling according to hypothetical patients' stage in the Transtheoretical Model (TTM; Prochaska & Diclemente, 1986) which suggests that patients proceed through 5 stages of behaviour change readiness. Additionally, based on a gap in the existing literature (Huijg et al., 2015), physicians were stratified by career status to compare the experience of barriers between residents and established physicians. Based on existing evidence (De Bourdeaudhuij et al., 2005; Pekmezi et al., 2010), we hypothesized that physicians will experience barriers to PA counselling differently based on patients' TTM stage. All other analyses were exploratory.

## **Materials and methods**

### ***Study population and recruitment***

Following institutional Research Ethics Board approval, a cross sectional convenience sample of physicians familiar with the TTM was recruited from seven primary care sites affiliated with the academic institution. After being invited to participate during a presentation by a campus exercise advocacy group, consenting physicians received a followup email with a brief description of the study and a link to an online Fluid Survey questionnaire. Invitations were sent to 127 physicians; 38 physicians (30%) responded.

### ***Study questionnaire***

Section one of the questionnaire queried physicians' demographics, academic training, practice characteristics and methods used for PA counselling. Section two probed physicians' experience of barriers across each stage of the TTM using a 5-point likert-scale indicating level of agreement. Each item addressed one of seven commonly reported barriers to PA counselling taken from Hébert, Caughy, and Shuval (2012), across each of the five stages of change (35 total items). To avoid ambiguity, participants were given the definition and goal of PA counselling for each stage of change of the TTM (Pekmezi et al., 2010). Prior to administration, the online survey was iteratively pilot tested by kinesiology and medical students with knowledge of PA behaviour change.

### ***Data analysis***

Responses were exported into Microsoft Excel version 16. Missing responses were recorded without imputation and thus were not included in analyses. Descriptive statistics were calculated for demographic and professional characteristics for each career status grouping. Respondents' frequency of agreeance for each barrier by each stage of the TTM were

represented using percentages in bar graphs. Data were qualitatively assessed for differences between TTM stages and career status grouping. Any relevant demographic or professional characteristics relating to perception of barriers to PA counselling were compared between career status groups using an appropriate statistical test.

## **Results**

Table 1 shows participants' demographic characteristics ( $N = 38$  respondents overall,  $n = 24$  residents, and  $n = 14$  established physicians). Figure 1 shows respondents' experience of barriers to PA counselling. Regardless of patients' stage of change, respondents reported lowest agreeance with 1) feeling adequately reimbursed for PA counselling, 2) believing other professionals should provide PA counselling, and 3) having adequate resources provide PA counselling.

Differences between TTM stage were seen for four barriers. Respondents reported a greater perception of 1) effectiveness, 2) adequate training, and 3) adequate time during the contemplation, preparation and action stages of the TTM, and a greater perception of 4) priority to counsel patients about PA in the contemplation and preparation stages, compared with the pre-contemplation and maintenance stages.

Figure 2 shows respondents' experience of barriers to PA counselling by career status. Compared to established physicians, residents reported 1) feeling less well-reimbursed, 2) more agreeance that other professionals should be involved in PA counselling, and 3) the perception of less time for PA counselling. These differences were present across all TTM stages. In contrast with the difference in perception of time, residents ( $M=4.25$ ,  $SD=2.53$ ) and established physicians ( $M=3.93$ ,  $SD=1.73$ ) did not differ significantly in self-reported time dedicated to PA counselling;  $t(36) = 0.374$ ,  $p = 0.35$ .

## **Discussion**

Respondents overall reported lower agreement for barriers which are situated at the organizational- or policy-level and thus are out of physicians' individual control (i.e., perception of low compensation for PA counselling, low willingness to let other professionals counsel patients on PA, and lack of resources). Such barriers could be addressed by organizational/policy level changes such as financial compensation for PA counselling (as with smoking cessation; Ontario Medical Association, 2009), the creation of opportunities for interprofessional collaboration, and integration of established PA counselling frameworks into practice (e.g. Exercise Vital Sign; Grant et al., 2014; or Brief Motivational Interviewing; Martins & McNeil, 2009), respectively.

As hypothesized, respondents perceived barriers to PA counselling differently depending on patients' TTM stage of change. Respondents perceived fewer barriers providing PA counselling to patients who have begun thinking about or pursuing PA routines (i.e., those in the middle stages of the TTM). Given patients in the pre-contemplation stage require greater fundamental changes in attitudes toward PA and/or that patients in the maintenance stage already maintain sufficient PA, respondents may feel as though they are maximizing the effectiveness of their PA counselling by counselling patients in the contemplation, preparation and action stages. These results should raise concern: individuals in the pre-contemplation stage are the farthest from becoming physically active and therefore may be at greater risk for chronic disease (Booth, Roberts, & Laye, 2012); as well, individuals in the maintenance stage may require additional followup or be at risk for relapse to previous stages (Samet, Rollnick, & Barnes, 1996). Considerations for future training include teaching physicians how to (1) use motivational

interviewing strategies among patients in the pre-contemplation stage to help patients begin thinking about PA (Martins & McNeil, 2009), and (2) teach patients in the maintenance stage to set coping plans if and when a relapse occurs to ensure behaviour change is sustained (Samet et al., 1996).

Stratifying respondents by career status revealed differences in the perception of time to allocate to PA counselling; compared to established physicians, residents may feel time is a greater barrier due to residents' busy schedules (Hurst, Kahan, Ruetalo, & Edwards, 2013; Martin, Nasmith, Takahashi, & Harvey, 2017), the time-requirement of building patient rapport, and/or dealing with more immediate health concerns in new patient-provider relationships (Hurst et al., 2013). However, given the non-significant difference in self-reported time spent counselling patients on PA between career status groupings, such differences may be only perceptual. Residents felt less adequately reimbursed for PA counselling, which may be due to lower financial compensation for medical residents compared to established physicians (Dorsey, Nincic, & Schwartz, 2006). Residents had greater agreeance that other professionals should counsel patients on PA, which may be due to recent developments in medical training, including increases in PA-related health promotion training during medical school (Garry et al., 2002; Hauer, Carney, Chang, & Satterfield, 2012), and/or the adoption of a more patient-centred treatment approach which encourages interprofessional collaboration (Kaba & Sooriakumaran, 2007).

### ***Study Limitations***

This study included a non-exhaustive list of physician barriers to PA counselling (for larger lists see Hébert et al., 2012; Huijg et al., 2015; Petrella & Lattanzio, 2002) and employed a small, non-random sample of 38 physicians invited to participate during a non-mandatory

presentation on the value of PA for promoting health outcomes. Future research should explore a greater number of barriers and employ random sampling methods to allow for a more complete picture of physicians' heterogeneous experience of barriers to PA counselling.

### ***Conclusions***

This study provides evidence that physicians' perception of barriers to PA counselling differs depending on their patients' TTM stage of change – greater barriers are perceived when counselling patients in the pre-contemplation and maintenance stages. This study also provides preliminary evidence that physicians perceive barriers to PA counselling differently based on career status – compared with established physicians, medical residents perceive less time and compensation for PA counselling; however, they may be more comfortable with inter-professional collaboration. If replicated, findings could inform the design of future interventions aimed at enhancing physicians' PA counselling for all patients regardless of patient stage in the TTM or physician career status.

**Acknowledgements:** We thank the kinesiology and medical students for their time in pilot testing the questionnaire, as well as *Nigel Barnim* for formatting the manuscript. We also thank all participants who took part in this study.

**Declaration of Interest Statement:** The authors declare no conflicting or competing interests



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## Tables

**Table 1. Demographic and Professional Characteristics of Participants**

Characteristic	Overall (N=38)	Residents (n=24)	Established Physicians (n=14)
Sex			
Male	16 (42)	11 (46)	5 (36)
Female	22 (58)	12 (54)	9 (64)
Description of practice*			
Faculty of Medicine preceptor	11 (29)	0 (0)	11 (79)
Faculty of Medicine resident	24 (63)	24 (100)	0 (0)
Academic appointment	9 (24)	0 (0)	3 (21)
Hospital employee	3 (9)	0 (0)	3 (21)
Emergency and urgent care	1 (3)	0 (0)	1 (7)
Full time group practice	7 (18)	0 (0)	7 (50)
Part time group practice	3 (8)	0 (0)	3 (21)
Other (Intrapartum Obstetrics)	1 (3)	0 (0)	1 (7)
Age in years <i>M(SD)</i>	34.84 (13.54)	27.00 (1.93)	48.29 (14.38)
Years in practice <i>M(SD)</i>	8.54 (13.55)	.82 (.60)	21.21 (15.16)
Self-reported minutes prescribing PA per appointment <i>M(SD)</i> †	4.13 (2.53)	4.25 (2.92)	3.93 (1.73)
Most useful resource for promoting PA*			
Additional training in PA and patient behaviour	8 (21)	7 (29)	1 (7)
Educational materials (i.e., brochures) to provide to patients	27 (71)	18 (75)	9 (64)
A proven behaviour change program for patients	23 (61)	15 (63)	8 (57)
I feel adequately trained and have adequate resources to promote PA	3 (8)	1 (4)	2 (14)
Other	4 (11)	3 (13)	1 (7)
Physician minutes per week engaged in moderate/vigorous PA <i>M(SD)</i>	179.37 (99.59)	155.88 (93.78)	219.64 (99.51)

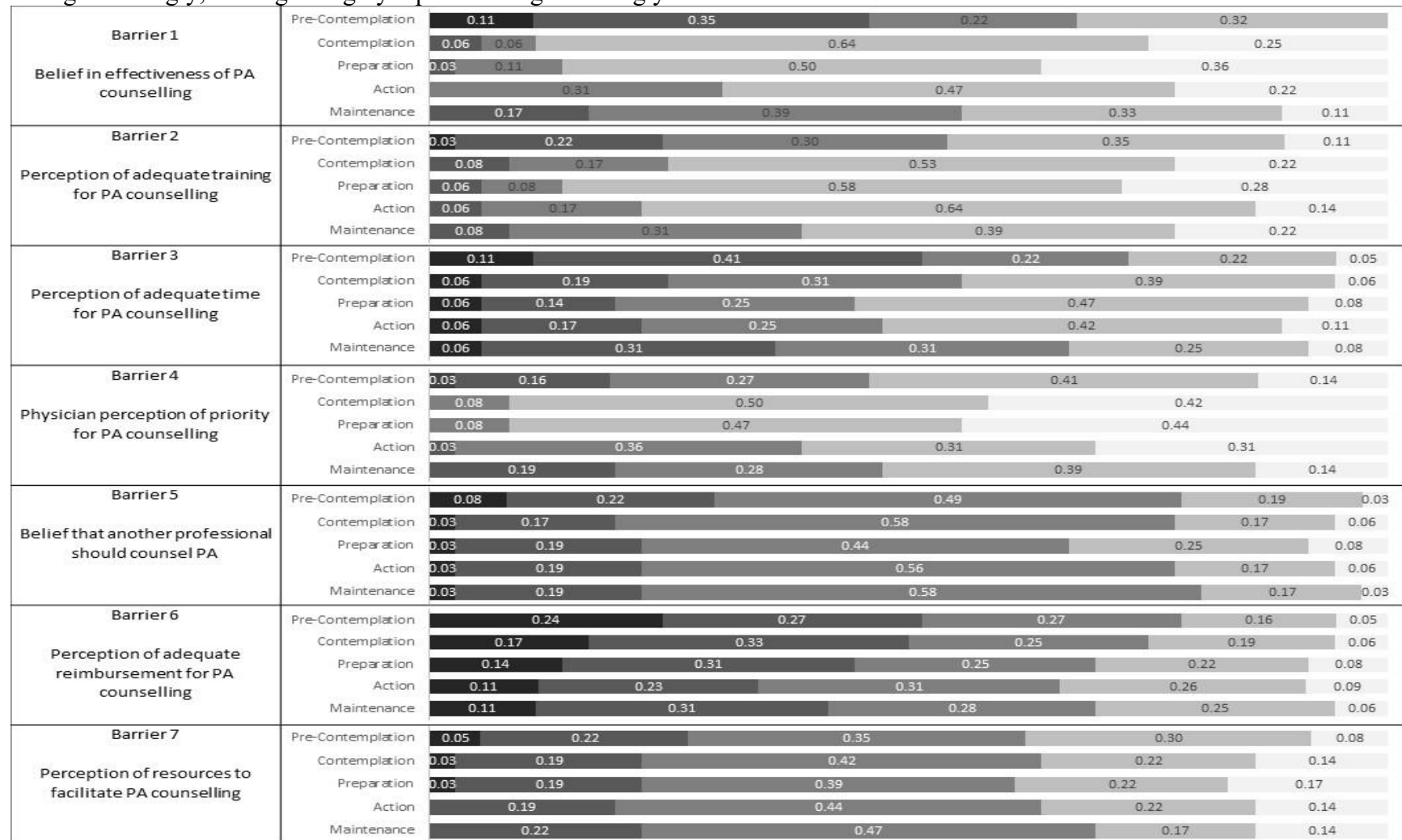
*Note.* PA, physical activity. Unless otherwise indicated, data are in *n* (%).

\*Respondents could select all that apply, thus column totals don't add up to 100%.

† There was no significant difference between Residents and Established Physicians self-reported time prescribing PA;  $t(36) = 0.374$ ,  $p = 0.35$

## Figures

**Figure 1.** Proportion of physicians overall ( $N=38$ ) reporting the level of agreement with the descriptions for a patient at each of the different stages of change. Darkest to lightest gray indicates agreement on a 5-point likert scale, where darkest gray represents “disagree strongly,” and lightest gray represents “agree strongly.”



**Figure 2.** The percentage of residents ( $n=24$ ) and established physicians ( $n=14$ ) reporting the level of agreement with the descriptions for a patient at each of the different stages of change. Darkest to lightest gray indicates agreement on a 5-point likert scale, where darkest gray represents “disagree strongly,” and lightest gray represents “agree strongly.”

		<b>Residents (n = 24)</b>					<b>Established Physicians (n = 14)</b>					
<b>Barrier 1</b> Belief in effectiveness of PA counselling	Pre-Contemplation	0.09	0.39	0.17	0.35		Pre-Contemplation	0.14	0.29	0.29	0.29	
	Contemplation	0.05	0.64		0.32		Contemplation	0.14	0.07	0.64	0.14	
	Preparation	0.14	0.41		0.45		Preparation	0.07	0.07	0.64	0.21	
	Action	0.18	0.55		0.27		Action		0.50	0.36	0.14	
	Maintenance	0.23	0.32	0.36	0.09		Maintenance	0.07	0.50	0.29	0.14	
<b>Barrier 2</b> Perception of adequate training for PA counselling	Pre-Contemplation	0.04	0.22	0.30	0.30	0.13	Pre-Contemplation	0.21	0.29	0.43	0.07	
	Contemplation	0.09	0.14	0.50	0.27		Contemplation	0.07	0.21	0.57	0.14	
	Preparation	0.05	0.09	0.55	0.32		Preparation	0.07	0.07	0.64	0.21	
	Action	0.05	0.14	0.68	0.14		Action	0.07	0.21	0.57	0.14	
	Maintenance	0.09	0.32	0.32	0.27		Maintenance	0.07	0.29	0.50	0.14	
<b>Barrier 3</b> Perception of adequate time for PA counselling	Pre-Contemplation	0.17	0.39	0.26	0.17		Pre-Contemplation	0.43	0.14	0.29	0.14	
	Contemplation	0.09	0.18	0.32	0.41		Contemplation	0.21	0.29	0.36	0.14	
	Preparation	0.09	0.14	0.36	0.41		Preparation	0.14	0.07	0.57	0.21	
	Action	0.09	0.14	0.32	0.41	0.05	Action	0.21	0.14	0.43	0.21	
	Maintenance	0.09	0.32	0.36	0.18	0.05	Maintenance	0.29	0.21	0.36	0.14	
<b>Barrier 4</b> Physician perception of priority for PA counselling	Pre-Contemplation	0.04	0.09	0.30	0.39	0.17	Pre-Contemplation	0.29	0.21	0.43	0.07	
	Contemplation	0.05	0.50		0.45		Contemplation	0.14	0.50	0.36		
	Preparation	0.09	0.41		0.50		Preparation	0.07	0.57	0.36		
	Action	0.05	0.32	0.23	0.41		Action		0.43	0.43	0.14	
	Maintenance	0.23	0.27	0.36	0.14		Maintenance	0.14	0.29	0.43	0.14	
<b>Barrier 5</b> Belief that another professional should counsel PA	Pre-Contemplation	0.09	0.22	0.35	0.30	0.04	Pre-Contemplation	0.07	0.21	0.71		
	Contemplation	0.05	0.14	0.55	0.18	0.09	Contemplation	0.21	0.64	0.14		
	Preparation	0.05	0.18	0.27	0.36	0.14	Preparation	0.21	0.71	0.07		
	Action	0.05	0.18	0.50	0.18	0.09	Action	0.21	0.64	0.14		
	Maintenance	0.05	0.14	0.59	0.18	0.05	Maintenance	0.29	0.57	0.14		
<b>Barrier 6</b> Perception of adequate reimbursement for PA counselling	Pre-Contemplation	0.22	0.39	0.26	0.13		Pre-Contemplation	0.29	0.07	0.29	0.21	0.14
	Contemplation	0.14	0.45	0.32	0.09		Contemplation	0.21	0.14	0.14	0.36	0.14
	Preparation	0.14	0.36	0.32	0.18		Preparation	0.14	0.21	0.14	0.29	0.21
	Action	0.09	0.27	0.41	0.18	0.05	Action	0.15	0.15	0.15	0.38	0.15
	Maintenance	0.09	0.41	0.36	0.14		Maintenance	0.14	0.14	0.14	0.43	0.14
<b>Barrier 7</b> Perception of resources to facilitate PA counselling	Pre-Contemplation	0.30	0.22	0.39	0.09		Pre-Contemplation	0.14	0.07	0.57	0.14	0.07
	Contemplation	0.23	0.41	0.23	0.14		Contemplation	0.07	0.14	0.43	0.21	0.14
	Preparation	0.23	0.41	0.23	0.14		Preparation	0.07	0.14	0.36	0.21	0.21
	Action	0.18	0.50	0.18	0.14		Action	0.21	0.36	0.29	0.14	
	Maintenance	0.23	0.50	0.14	0.14		Maintenance	0.21	0.43	0.21	0.14	