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## **Rheumatology health care providers' views and practices on obesity and smoking cessation management in rheumatoid arthritis**

Derin Karacabeyli MD<sup>1</sup> (0000-0002-6597-0302), Kam Shojania MD<sup>2,3</sup> (0000-0003-2525-3744), Natasha S Dehghan MD<sup>2,3</sup>, Diane V Lacaille MD MHSc<sup>2,3</sup> (0000-0002-4065-4151)

<sup>1</sup>Department of Medicine, University of British Columbia, Vancouver, British Columbia, Canada

<sup>2</sup>Division of Rheumatology, Department of Medicine, University of British Columbia, Vancouver, British Columbia, Canada

<sup>3</sup>Arthritis Research Canada, Richmond, British Columbia, Canada

### **Corresponding author:**

Diane Lacaille MD MHSc

Professor, Rheumatology, University of British Columbia

Associate Scientific Director, Arthritis Research Canada

5591 Number 3 Rd, Richmond

BC V6X 2C7

T: +1 604 207 4019

F: +1 604-207-4056

[dlacaille@arthritisresearch.ca](mailto:dlacaille@arthritisresearch.ca)

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### **Declarations**

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**Conflicts of interest:** The authors declare no conflicts of interest. Authors have full control of all primary data and agree to allow the journal to review the data if requested.

**Ethical approval:** Obtained from the University of British Columbia's Behavioural Research Ethics Board (certificate # H19-01272).

**Consent to participate and consent for publication:** The cover page for our survey was a consent form and completion of the survey was considered implied consent.

**Availability of data and material:** The datasets generated and analyzed during this study are available from the corresponding author on reasonable request.

**Code availability:** N/A

## **Abstract**

**Objective:** To assess rheumatology health care providers' (HCPs) knowledge, beliefs, self-efficacy, practices, and perceived barriers pertaining to weight management and smoking cessation counselling in patients with rheumatoid arthritis (RA).

**Method:** We administered an online survey to collect self-reported data on rheumatology HCPs' knowledge, beliefs, self-efficacy, perceived barriers, and practices related to weight management and smoking cessation counselling. Participants were recruited through invitation emails (with anonymous survey links) sent by three Canadian rheumatology organizations.

**Results:** Fifty-nine rheumatology HCPs (15 nurses, 44 physicians) completed the survey (response rate: 11%). Over 85% correctly identified associations between obesity, or smoking, and more severe or active RA, as well as poorer response to treatment. All but one participant agreed that it was part of their responsibility to discuss these issues with patients, but 78% (46/59) felt not or slightly confident in their ability to help patients quit smoking or achieve clinically significant weight loss. The majority did not routinely assist patients in accessing appropriate resources or providers (only 42% did for obesity, 36% for smoking), send referrals (2-44%, depending on referral), or offer relevant educational materials (15% for obesity, 20% for smoking). Common barriers included competing demands and lack of time, training, access to expertise, and knowledge of available programs.

**Conclusion:** Most rheumatology HCPs understood the implications of cigarette smoking and obesity in RA and accepted responsibility in addressing these issues. However, they lacked the time, training, confidence, and knowledge of local resources to do so effectively. There is a need to bridge this gap.

**Key points**

- Training through medical and nursing school as well as residency on weight management and smoking cessation counselling was nearly unanimously described as poor or fair.
- Most rheumatology health care providers understood the implications of cigarette smoking and obesity in rheumatoid arthritis and accepted responsibility in addressing these issues; however, they lacked the time, training, confidence, and knowledge of local resources to do so effectively.
- There is a need to bridge the gap between health care providers' intentions and actions, and this may include the development of guides outlining local weight management and smoking cessation expertise, programs, referral processes, and educational materials.

### **Introduction:**

Internationally, obesity and cigarette smoking continue to be major public health issues. Within Canada, 63% of adults are overweight or obese[1] and 16% actively smoke[2]. Both obesity and tobacco use have been associated with poorer response to treatment and more severe disease in patients with rheumatoid arthritis (RA)[3–5]; a higher incidence of RA is also observed in those who smoke[6]. Further, patients with RA and obesity report more pain[7] and depressive symptoms[8]. Obesity and tobacco use, therefore, are important issues to consider for any practicing rheumatologist. While smoking cessation counselling is recommended in RA guidelines[9,10] and physician advice was found in a systematic review to lead to 1.7 times higher quit rates[11], smoking cessation counselling is variably performed by rheumatologists[12,13]. The data on weight counselling in patients with RA is limited, but after being diagnosed with RA, patients' BMIs tend to rise, sometimes into the overweight or obese range[14].

Understanding knowledge, beliefs, self-efficacy, existing practices, and barriers to weight management and smoking cessation counselling of rheumatology health care providers (HCPs) will facilitate the development of resources or interventions to enhance counselling around weight, healthy behaviours, and smoking. Within rheumatology, one qualitative study to date has assessed HCPs' perspectives of obesity management[15], and two studies have evaluated rates of smoking cessation counselling[12,13]. Further, only one study included a small amount of Canadian representation in their sample. Opportunities therefore exist to deepen our understanding of weight and tobacco use counselling in rheumatology. Through a cross-sectional survey, we aimed to fill this knowledge gap.

## Views & practices on smoking & obesity in RA

Our objectives were to assess providers’:

1. Knowledge of the impact of obesity and cigarette smoking on RA outcomes;
2. Knowledge of clinical guidelines as well as resources or programs available to patients;
3. Beliefs on obesity and cigarette smoking in their patients with RA;
4. Self-efficacy at addressing weight management and smoking cessation;
5. Practices related to weight management and smoking cessation counselling; and
6. Perceived barriers when counselling on weight and smoking.

We hypothesized that providers’ knowledge, self-efficacy, and practices in the management of weight and tobacco use would be limited, and beliefs would highlight ambiguity as to who is responsible for counselling. We anticipated that barriers such as lack of time and discomfort addressing these sensitive topics would predominate.

### **Materials and Methods:**

#### *Study Design, Setting, and Participants*

We performed a cross-sectional study, using an online survey to collect self-reported data on rheumatology HCPs’ knowledge, beliefs, self-efficacy, perceived barriers, and practices pertaining to obesity, tobacco use, weight management, and smoking cessation. The survey items were derived from previously published studies [16–23] . No validated questionnaires assessing the aforementioned variables in rheumatology HCPs were discovered during our literature search. Therefore, we created survey questions based on the literature, and to ensure face and content validity, survey feedback was solicited from three rheumatologists and one rheumatology nurse to inform improvements and ensure clarity prior to administration. To reduce social

desirability bias, no personal identifiers were collected; it was made explicit that survey responses were anonymous. Questions were clustered and page breaks were used to reduce question order bias.

Eligible participants were staff rheumatologists and rheumatology nurses practicing part-time or full-time in Canada with membership to the Canadian Rheumatology Association, BC Society of Rheumatologists, or the Association of Rheumatology Nurses in BC. Residents, fellows, pediatric rheumatologists, and generalists (i.e. family physicians and general internists) were excluded from participation. Participants were recruited by distributing an anonymous survey link via email to rheumatology HCPs in BC and across Canada through invitations sent by the above-mentioned associations. The data collection period was open from September 17<sup>th</sup> to December 16<sup>th</sup>, 2019, during which time one invitation and two reminder emails were sent.

### *Data sources, management, and analysis*

Ethical approval was obtained from the University of British Columbia's Behavioural Research Ethics Board (certificate # H19-01272) and procedures followed were in accordance with their ethical standards. The cover page for our survey was a consent form and completion of the survey was considered implied consent. The online survey was hosted on the secure Qualtrics platform. To improve data quality, Qualtrics' "RelevantID" feature was enabled to detect potential duplicate entries. This feature collects data from a respondent's computer (operating system, browser version, etc.), creates a digital fingerprint, and uses algorithms to determine the likelihood that two survey responses came from the same person. These responses were flagged. We individually reviewed flagged responses, as health care professionals often share

workstations that may have the same digital fingerprint. If responses were  $\geq 90\%$  similar in these flagged surveys, we deemed these to be true duplicates and one was not included in data analysis. Descriptive statistics were used to analyze and present the data.

### **Results:**

Of 556 eligible participants, 59 rheumatology HCPs (15 nurses and 44 physicians) completed the survey (response rate: 11%). Participant characteristics are outlined in **Table 1**. Notably, there were no active smokers and 73% of participants reported meeting Canadian guidelines suggesting 150 minutes of moderate-to-vigorous physical activity per week.

### *Knowledge, awareness, and training*

Ninety-five percent (56/59) of participants described their obesity management training during medical/nursing school or residency as poor or fair. Similarly, 88% (52/59) described their smoking cessation training as poor or fair. There were 27% and 37% of participants who reported additional training (e.g. seminars, lectures, workshops) in weight management and smoking cessation, respectively. While familiarity with Canadian Obesity Guidelines was low (79% described knowing little to nothing about them), 61% reported being somewhat to very familiar with Canadian Physical Activity Guidelines. The majority of rheumatology HCPs correctly identified associations between obesity, or smoking, and more severe or active RA (86% and 93% for obesity and smoking, respectively), as well as associations between obesity, or smoking, and poorer response to treatment (90% and 95% for obesity and smoking, respectively). A larger proportion of nurses did not correctly identify these associations: 20% (3/15) disagreed that there were associations between obesity and more severe or treatment-



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resistant RA; similarly, 13% (2/15) disagreed with the associations related to smoking. Seven percent (3/44) and 5% (2/44) of physicians disagreed that obesity and smoking, respectively, were associated with more severe RA; one physician disagreed that either was associated with poorer response to treatment.

### *Beliefs and self-efficacy*

Nearly every participant (98%) agreed that it was part of their responsibility as a rheumatology HCP to have discussions about smoking cessation (with patients who smoke) and maintaining or achieving a healthy weight with their patients. Over 83% also believed that ensuring that a patient is counselled about obesity or cigarette smoking is a responsibility shared with family physicians (50/59 for obesity; 49/59 for smoking).

When asked to determine the importance of obesity and tobacco use relative to all the issues relevant to the management of RA (disease activity, pain, medications, comorbidities, vaccinations, etc.), 93 and 97% of participants rated obesity and tobacco use, respectively, as moderately to very important.

**Figure 1** summarizes HCPs' perceptions of the effectiveness of various interventions for weight loss and smoking cessation. Bariatric surgery for weight loss and nicotine replacement therapy and prescription medications for smoking were believed to be the most effective interventions; physicians' advice was believed to be the least effective intervention for both weight loss and smoking.

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With regards to perceived self-efficacy, most participants felt moderately to very confident in their ability to talk with patients about smoking habits and weight (46/59 [78%] and 37/59 [63%], respectively). However, their confidence in helping patients quit smoking or lose weight and their knowledge of available interventions to facilitate these processes were much lower. Many were not confident or only slightly confident in their knowledge of interventions for smoking (36/59, 61%) or obesity (37/59, 63%), and over three quarters of participants (46/59, 78%) felt not at all or only slightly confident in their ability to help patients quit smoking or achieve clinically significant weight loss (i.e.  $\geq 5\%$ ) if overweight or obese. Nurses reported higher confidence than physicians in all areas, with the largest differences in perceived ability to discuss smoking habits with patients (93% vs. 73%), knowledge of interventions for smoking cessation (80% vs. 25%) and weight management (53% vs. 32%), and ability to help patients achieve clinically significant weight loss (40% vs. 16%).

### *Practices*

Self-reported practices of HCPs in relation to weight management and tobacco use counselling are described in **Table 2**. While most participants frequently asked about tobacco use, discussed smoking cessation, and suggested changes to physical activity and diet, the majority did not routinely assist patients in accessing appropriate resources or providers, send referrals, or offer relevant educational materials.

### *Barriers*

The most common barriers to addressing overweight/obesity and smoking were: more important issues to discuss, lack of time, lack of training in obesity management or smoking cessation, lack

of access to expertise, and lack of knowledge of programs available to patients (**Figure 2 and 3**). The top three barriers (i.e., competing priorities, lack of time, and lack of knowledge of weight management programs) did not differ between physicians and nurses.

### **Discussion:**

We conducted a survey of rheumatology nurses and physicians across Canada to better understand the knowledge, beliefs, self-efficacy, existing practices, and barriers to weight management and smoking cessation counselling of rheumatology health care providers. Our findings indicate that participants understood the negative implications of obesity and smoking in RA and accepted responsibility in addressing these issues. However, they described lacking the training and confidence to do so effectively. While these issues were reportedly discussed routinely with only a minority reporting ill-preparedness or discomfort, the majority of participants did not routinely send referrals, offer educational materials, or help patients access appropriate resources or expert providers. This seemed to be driven by a lack of knowledge of available programs, a lack of perceived access to expertise, and a lack of training to provide the relevant services. Further, competing demands and a lack of time limited HCPs' capacity to routinely address weight management and tobacco use.

Similar barriers have been identified in the literature. In their focus group of an eight-member multidisciplinary rheumatology team (two physicians, four nurses, and two podiatrists), Colligan et al. identified that most participants felt ill-prepared to address obesity sensitively and effectively, and lacked both time and access to weight management expertise[15] . Further, uncertainty emerged around who is ultimately responsible for addressing weight with patients. In

our study, lack of time and access to expertise were also frequently described, but neither ill-preparedness nor ambiguity around the rheumatology HCP's role were significant barriers. These differences may be attributable to study methodology or context: our study captured views of a larger number of Canadian rheumatologists and nurses, rather than that of a single rheumatology team, in a quantitative rather than qualitative manner. Potential biases of surveys, such as responder bias and social desirability affecting self-reported data, along with differences in training/clinical exposure between Canada and the UK may also contribute to the aforementioned differences.

Of note, some of our hypotheses were not supported by the results of our study. Most participants reported frequently discussing smoking cessation, assessing readiness to change, and promoting behavioural modifications (e.g. physical activity and diet changes) with their patients with obesity. While these data are encouraging, self-reported counselling practices are likely overestimated, and as illustrated in **Table 1**, the participant pool was rather healthy. There were no active smokers and nearly three quarters of participants both had BMIs within the healthy range and reported meeting Canadian Physical Activity Guidelines for weekly aerobic activity. In comparison, a multinational European survey across 25 countries with 395 participating rheumatologists found that 65% of rheumatologists gave smoking cessation advice to most smokers (i.e. more than 80%) with inflammatory rheumatic diseases [12]. Of note, in that survey, 25 participating rheumatologists actively smoked, none of whom reported giving smoking cessation advice to most smoking patients. These results, similar to ours, are limited by selection bias: HCPs who value the role of tobacco use counselling are more likely to respond to surveys of this nature and stigma around cigarette smoking likely limits participation of HCPs

who smoke. This selection bias may also lead to overrepresentation of HCPs passionate about weight management and underrepresentation of those with elevated BMI. In a study where response bias was minimized by the observational study design, smoking cessation counselling was documented in the electronic health record (EHR) in only 10% of visits of patients who actively smoked[13] . Further, smoking cessation counselling was less likely to occur in patients with obesity. Based on a previous qualitative study, the authors considered whether this low rate was attributable to rheumatologists perceiving these counselling practices as a role of the primary care provider[13,24] . It is also possible that not all discussions pertaining to smoking cessation counselling were documented in the EHR.

Rheumatology HCPs have various competing clinical demands and limited time, thus comprehensive counselling sessions on tobacco use and weight management may not realistically fall within their scope. However, the implications of cigarette smoking and obesity on RA disease severity and treatment responsiveness are well-established [3–5] . Further, many tobacco-using patients are unaware of the effects that cigarette smoking may have on their RA, and understanding these associations has been found to be an important motivating factor for patients when attempting to cut down or quit [25–27] . Therefore, rheumatology HCPs are well-positioned to educate patients on health risks, initiate these conversations respectfully and sensitively when appropriate, connect patients to local expertise through referrals, and provide relevant educational materials if the patient is interested.

Our study identifies an important gap between HCPs' intentions and actions. A guide to resources outlining local weight management and smoking cessation expertise, programs,

referral processes, and educational materials may facilitate bridging this gap. Further, to address limits in knowledge and confidence, brief instructions and resources on motivational interviewing and counselling through the stages of change could be included for interested HCPs. To address this in the long term, focus could be placed on efforts to enhance medical education around tobacco use and weight counselling, as nearly every participant in this study described the training they received in these areas as poor or fair, and smoking cessation and weight management are relevant to many chronic diseases across medical fields.

We acknowledge several limitations of this study. Self-reported surveys lend themselves to selection, social desirability, and response biases. While we tried to minimize these biases through anonymous data collection and careful survey design, our sample likely included an overrepresentation of healthy rheumatology HCPs who recognize the importance of counselling and an underrepresentation of HCPs with elevated BMI, a smoking history, or a disinterest or discomfort in counselling on weight management or tobacco use. Further, our response rate was low and our sample size was small, limiting generalizability. Our study was not statistically powered to compare responses of nurses and rheumatologists, and our recruitment of nurses was limited to one province due to logistical issues. For these reasons, we performed a limited subgroup analysis where we highlighted differences between physicians and nurses with the goal of generating hypotheses to spark further research rather than drawing conclusions. Lastly, we dichotomized variables to facilitate statistical analysis, but this, too, can be seen as a limitation. Despite these various limitations, we believe that our results lend important insights. The knowledge, access, and training gaps identified amongst this relatively healthy, self-selected sample likely underestimate those within the general population of rheumatology HCPs, in

whom the need for addressing the gaps identified might be even greater. Our study points to the need for resources to support rheumatology HCPs in addressing weight management and smoking cessation with patients with RA, such as the development of a brief resource kit for rheumatology HCPs, outlining local expertise, programs, referral processes, and educational materials for patients.

In summary, this study shows that Canadian rheumatology health care providers are aware of the implications of cigarette smoking and obesity in RA, accept a degree of responsibility in addressing these issues, and report discussing these issues routinely. That said, they are limited in their ability to catalyze meaningful change by barriers such as competing priorities and lack of time, training, access to expertise, and knowledge of available programs. Training through medical and nursing school as well as residency on these topics is nearly unanimously described as poor or fair. Short term, resources outlining local providers, programs, referral processes, and educational materials may empower rheumatology HCPs to sensitively educate patients and connect them with appropriate local expertise, if interested. Long term, a shift in focus upstream to medical schools, nursing schools, and residency programs may be of benefit to enhance the quality of education around stigma-free weight management and smoking cessation counselling.

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**Table 1. Participant characteristics (N = 59).**

<b>Occupation</b>	Rheumatologist	44 (75%)
	Nurse	15 (25%)
<b>Gender</b>	Male	16 (27%)
	Female	42 (71%)
	Prefer not to specify	1 (2%)
<b>Years in practice</b>	<3	7 (12%)
	3-5	12 (20%)
	6-10	9 (15%)
	11-20	11 (19%)
	>20	20 (34%)
<b>Body Mass Index</b>	<18.5	0
	18.5-24.9	42 (71%)
	25-29.9	13 (22%)
	≥30	4 (7%)
<b>Cigarette smoking status</b>	Active	0
	Quit	7 (12%)
	Never smoked	52 (88%)
<b>Level of self-reported weekly moderate-to-vigorous physical activity</b>	<150 minutes	16 (27%)
	≥150 minutes	43 (73%)

**Table 2. Self-reported frequency of rheumatology providers' practices with all patients, patients who are overweight or obese, and patients who smoke tobacco.**

<b>With all patients</b>	<b>Often or always</b>	<b>Half the time or less</b>
Asking about tobacco use	55 (93%)	4 (7%)
Measuring weight	23 (39%)	36 (61%)
Calculating BMI	11 (19%)	48 (81%)
<b>With patients who are overweight or obese</b>	<b>Often or always</b>	<b>Half the time or less</b>
Suggesting increasing physical activity	47 (80%)	12 (20%)
Suggesting changes to diet	36 (61%)	23 (39%)
Discussing weight loss	33 (56%)	26 (44%)
Assessing interest in losing weight (i.e. readiness to change)	30 (51%)	29 (49%)
Advising on health risks associated with obesity	28 (47%)	31 (53%)
Suggesting physical activity tracking	28 (47%)	31 (53%)
Referring for physical activity counselling	26 (44%)	33 (56%)
Assisting in accessing appropriate resources and providers	25 (42%)	34 (58%)
Assisting those who are interested in losing weight to develop a plan to achieve a healthy weight	17 (29%)	42 (71%)
Providing educational materials related to achieving or maintaining a healthy weight	9 (15%)	50 (85%)
Referring to a dietician or nutritionist	8 (14%)	51 (86%)
Prescribing medications for weight loss	2 (3%)	57 (97%)
Referring to bariatric surgery	1 (2%)	58 (98%)
<b>With patients who use tobacco</b>	<b>Often or always</b>	<b>Half the time or less</b>
Discussing smoking cessation	52 (88%)	7 (12%)
Advising on health risks associated with cigarette smoking	49 (83%)	10 (17%)
Assessing interest in changing tobacco use behaviour (i.e. readiness to change)	41 (69%)	18 (31%)
Assisting in accessing appropriate resources and providers	21 (36%)	38 (64%)
Assisting those who are interested in quitting to develop a plan to quit or taper	20 (34%)	39 (66%)
Providing educational materials related to tobacco cessation	12 (20%)	47 (80%)
Arranging referrals for appropriate services	9 (15%)	50 (85%)
Prescribing or recommending nicotine replacement therapy products for patients attempting to quit	8 (14%)	51 (86%)
Prescribing medications (e.g. bupropion, varenicline) to those ready to quit	1 (2%)	58 (98%)

### **Figure Legends**

**Fig. 1** Rheumatology providers' views on the effectiveness of various interventions for weight loss and smoking cessation

**Fig. 2** Rheumatology providers' perceived barriers for addressing weight

**Fig. 3** Rheumatology providers' perceived barriers for addressing cigarette smoking