

The well-being and self-regulation capacity of physicians

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Abstract

Physician well-being has become an important area of interest given that reduced well-being can have a negative effect on patient outcomes. However, research has predominantly focused on impairment thus studies addressing physicians' positive functioning are limited. The purpose of this two-phase, mixed methods study was to investigate the well-being and self-regulation capacity of physicians using a positive psychology lens. In Phase 1, 132 physicians ($n = 40$ physicians; $n = 92$ resident physicians) completed online questionnaires to assess their levels of psychological and affective well-being and self-regulation capacity. Selected based on Phase 1 data, 12 physicians then took part in an in-depth individual interview in Phase 2 to discuss their experiences of psychological well-being and self-regulation. Results of Phase 1 showed that physicians and resident physicians had moderate and high levels of self-regulation capacity, respectively. While both groups reported high levels of psychological well-being, they had average levels of positive and negative affect. MANOVAs confirmed the hypothesis that high self-regulating physicians and resident physicians would have higher levels of psychological well-being and positive affect compared to those with lower levels. However, those with higher self-regulation capacity did not have lower negative affect, nor did physicians have significantly higher levels of psychological and affective well-being than resident physicians. Regression analyses confirmed the hypothesis that a significant amount of variance in levels of psychological well-being would be explained by self-regulation capacity. There was a particularly strong relationship between self-regulation capacity and the dimensions of purpose in life and environmental mastery, which suggests that physicians who effectively self-manage may be better able to preserve a sense of purpose and an adequate work-life balance in their daily life. A qualitative content analysis of the Phase 2 qualitative data revealed that physicians had both high and low functioning experiences of psychological well-being across the dimensions of

self-acceptance, positive relations with others, environmental mastery, and autonomy. They, however, reported high functioning for the dimensions of personal growth and purpose in life. Their experiences also varied based on their professional and personal life contexts, with work-life balance emerging as a prevalent theme. Physicians' self-regulation experiences involved individualized preparation, performance, and evaluation processes that were perceived to influence their well-being. Results of a composite analysis suggest that the development of effective self-regulation skills could be one way to help physicians achieve satisfactory levels of well-being.

Keywords: physician, psychological well-being, self-regulation capacity, affect, positive psychology, health, wellness

*To Mom and Dad, my inspiration.
You have made this happen.*

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To Begin ...

What's good about medicine is there is always something to do so you don't have to think about your own problems. What's bad about medicine is there is always something to do so you don't have to think about your own problems.

- Dr. Simon Davidson

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PART I

Introduction and Literature Review

Physician Health and Well-Being

It is fair to say that when Canadians seek medical care, they assume that physicians will perform at their best. However, seldom do they consider that physicians are no different than them (Arnetz, 2001), vulnerable to the same illnesses, challenges, and experiences (Canadian Medical Association, 1998; Simon & Durand-Bush, 2009). Overall, the medical knowledge and skills physicians possess are derived from years of intensive and committed training. Suffice it to say, they are well prepared to “fix what is broken.” However, it is disconcerting to learn that they may not be “fixing what may be broken within themselves”. While most physicians recognize the importance of their well-being, many have lost sight of maintaining it (Shanafelt, Sloan, & Habermann, 2003). This is particularly troublesome given the negative effect reduced well-being can have on patient outcomes and quality of care (Eckleberry-Hunt et al., 2009; Shanafelt, Bradley, Wipf, & Back, 2002; Taub, Morin, Goldrich, & Benjamin, 2006); healthy physicians are less likely to commit errors in the workplace (Walsh, 2013). Put into economic terms, the cost of medical errors in the United States has been estimated at \$19.5 billion dollars (Anel, Davidow, Hollander, & Moreno, 2012). Furthermore, Dewa, Jacobs, Thanh, and Loong (2014) estimated the total cost of burnout for Canadian physicians to be \$213.1 million dollars. Clearly, reduced physician well-being has a significant impact on healthcare systems in North America. Dewa and colleagues concluded that adverse outcomes may potentially be decreased through prevention and promotion activities designed for physicians.

Well-being in the context of physician health and wellness has not been clearly defined. There are no conceptual frameworks to examine it, and it has been used interchangeably with

wellness-related concepts such as burnout, anxiety, stress, resilience, to name a few. The majority of research on physician well-being has focused on, but is not limited to, dysfunctional rather than functional outcomes such as: burnout¹ (e.g., Diez-Pinol, Dolan, Sierra, & Cannings, 2008; Dunn, Arnetz, Christensen, & Homer, 2007; McManus, Winder, & Gordon, 2002; Voltmer, Kieschke, Schwappach, Wirsching, & Spahn, 2008); depression² (e.g., Firth-Cozens, 2001; Gardiner, Lovell, & Williamson, 2004; Hartwig & Nichols, 2001); stress and anxiety³ (e.g., Arnetz, 2001; Cohen & Patten, 2005; Gardiner et al., 2004; Lee, Stewart, & Brown, 2008; McManus, Winder, & Gordon, 1999); substance abuse (e.g., Firth-Cozens, 2001); and suicide (Hartwig & Nichols, 2001; Hawton, Clements, Sakarovitch, Simkin, & Deeks, 2001). In Canada, the 2008 Canadian Physician Health Survey involving 8,000 practicing physicians revealed that approximately 23% felt depressed, 33% were stressed due to work, and 60% had excessive work preventing them from pursuing personal and family interests (Canadian Physician Health Institute, 2011). A study from the Canadian Association of Interns and Residents showed that 33% of resident physicians rated their life as "quite" to "extremely" stressful, 52% experienced intimidation and harassment in the workplace, and 18% felt their mental health was either "fair" or "poor" (Cohen et al., 2008).

Burnout appears to be the most prevalent focus of the research on physician well-being to date. It is characterized by emotional exhaustion, depersonalization, and a low sense of accomplishment (Maslach & Leiter, 2008; Krasner et al., 2009; Sibbald, 2003). A potential reason for the prevalence of studies on this topic may be that there is a higher incidence of

¹ Up to 60% of physicians reported symptoms of burnout (Shanafelt et al., 2003), while up to 46% of Canadian physicians appeared to be in advanced stages of burnout (Puddester, 2004).

² While 18% of Canadian physicians were reportedly depressed, only 25% of them considered getting help and only 2% actually did (Wallace & Lemaire, 2007).

³ Up to 46% of physicians consider medical practice to be "very" or "extremely" stressful (Henry, 2004). Physicians under stress are more likely to treat patients poorly, both medically and psychologically, and are also more prone to making errors of judgment (Arnetz, 2001).

burnout among physicians compared to the general population (Eckleberry-Hunt et al., 2009; Hartwig & Nichols, 2001). The importance of burnout and well-being is “significantly higher in the field of medicine as medicine is involved with critical decisions regarding one’s health” (Uncu, Bayram, & Bilgel, 2006, p. 514). In addition to burnout, reduced well-being has also been associated with: decreased life satisfaction (Gerrity, 2001; Shanafelt et al., 2003), impaired personal and professional relationships (Weiner, Swain, & Gottlieb, 1998), increased attrition rates (Cohen & Patten, 2005; Wallace, Lemaire, & Ghali, 2009), loss of autonomy in the medical environment (Arnetz, 2001; Henry, 2004), excessive workloads and standards of training and practice (Musselman, 2003; Panagopoulou, Montgomery, & Benos, 2006; Wallace & Lemaire, 2007), sleep deprivation (Sibbald, 2003), reduced work-life balance (Shanafelt et al., 2003; Wansbrough, 2003; Weiner et al., 1998), and increased threats of malpractice suits and patient deaths (Henry, 2004).

It seems paradoxical that the training and practice of medicine, aimed at healing others, does not consistently lead physicians to adopt preventative or proactive behaviours to take better care of themselves and maintain high levels of well-being (Vltmer et al., 2008). Several efforts have been made to prioritize physician well-being (Cohen, Marfell, & Greene, 2014; Dunn et al., 2007; Gardiner et al., 2004; Krasner et al., 2009). Many national associations have formally acknowledged its importance (Boorman, 2009; Wallace et al., 2009), including the Canadian Medical Association (1998) who put forth the Policy on Physician Health and Well-Being (Puddester, 2001). Although this suggests that those in the medical profession may be developing a clearer understanding of physician well-being, this does not appear to be the case. According to several authors, little is known about what it means for physicians “to be well” beyond pathology (Arnetz, 2001; Novack et al., 1997; Weiner, Swain, Wolfe, & Gottlieb, 2001).

For the most part, the study and diagnosis of disease, distress, impairment, or dysfunction has dominated the literature on physician health and well-being (Compton, 2005).

Important exceptions, however, include research by Weiner and colleagues (1998) who found that while stress in the medical environment negatively influences well-being, supportive social relationships positively correlate with it. A unique contribution of their work was the use of markers of positive functioning, not just impairment, to predict well-being. Another emerging concept is that of resilience, which reflects an individual's capacity to respond to setbacks in a healthy and adaptive manner, persist in the face of obstacles, and achieve personal goals (Epstein & Krasner, 2013). It has been positively underlined in the medical literature (Arnetz, 2001; Gautam, 2009), and identified as a central element of physician well-being (Zwack & Schweitzer, 2013). Still, the literature largely fails to provide a complete view of well-being (Compton, 2005) and conceptualize it as *more* than the presence or absence of negative behavioral indices (Aase, Nordrehaug, & Malterud, 2009; Spickard, 2001; Weiner et al., 1998).

With comparatively little evidence on what helps physicians to be “well”, the literature appears to distort perceptions of what is optimal well-being in the medical environment, and limits the promotion and achievement of positive and healthy living (Shanafelt et al., 2003; Wallace et al., 2009; Yamey & Wilkes, 2001). Indeed, defining something by what it is not is an ineffective way of describing any phenomenon (Compton, 2005), and is clearly leading individuals and organizations to settle for less than what can be achieved (Shanafelt et al., 2005). Zwack and Schweitzer (2013) posed the question: “If every fifth physician is affected by burnout or other stress-related disorders, what about the other four? How do they deal with the challenges, strains, and restrictions on their professional lives?” (p. 383). Indeed, why do we know so much about negative functioning, but comparatively little about positively functioning

physicians (Weiner et al., 2001)? Positive psychology researchers (e.g., Seligman & Csikzentmihalyi, 2000) have begun to address this question (Searle, 2008).

Positive Psychology and Well-Being

Positive psychology. The World Health Organization (WHO) (2009) defines health as a state of physical, mental, and social well-being – not merely the absence of disease or infirmity. Health is also defined as a positive concept that emphasizes social and personal resources, as well as physical capacities (WHO, 2009). According to Compton (2005), although being disease-free is a worthy goal, a state of enhanced experience leads to a more holistic sense of well-being. Embodying this definition, positive psychology espouses that psychology is not exclusively the study of weakness and damage (Haworth & Hart, 2007; Sheldon & King, 2001), it is also that of optimal functioning. It is a more appreciative perspective regarding human potentials, motives, and capacities aiming to understand the adaptive and fulfilling elements of behavior (Seligman & Csikzentmihalyi, 2000; Sheldon, Frederickson, Rathunde, Csikzentmihalyi, & Haidt, 2000).

Although several researchers have begun to endorse a more positive psychology perspective to study physician well-being (Schwenzfeier, Rigdon, Hill, Anderson III, & Rothballer-Seelert, 2002; Shanafelt et al., 2005; Taub et al., 2006; Yamey & Wilkes, 2001), pertinent questions remain largely unanswered. For example, what is physician well-being and, perhaps more importantly, how is it achieved and maintained (Shanafelt et al., 2003)? This study aimed to address this gap by using a positive psychology perspective to examine the well-being of physicians.

Hedonic and eudaimonic approaches of well-being. Echoing the WHO's definition of health (2009), two primary approaches to well-being within positive psychology have been proposed (Ryan & Deci, 2001). First, hedonism reflects the view that well-being consists of

subjective happiness and the experience of pleasure, and the key motivating force of behavior is to promote and maintain high levels of happiness and overall satisfaction in one's life (Compton, 2005; Diener, 1984, 2000). Taking a hedonic perspective, Diener (1984) postulated that subjective well-being is the combination of life satisfaction, that is, a global judgment about the acceptability of one's life, and the balance between positive (i.e., pleasant) and negative (i.e., unpleasant) affect. Resonating with positive psychology, the subjective well-being perspective marked a critical step in well-being research because it conceptualized well-being as more than the absence of negative affect (Schimmack, 2007). Empirically, subjective well-being is assessed by the measurements of both life satisfaction as well as positive and negative affect (Searle, 2008). Diener (1984) found that single measures were too simplistic and not sensitive enough to capture both the temporal and dynamic nature of well-being.

The hedonic view of well-being, including the concept of subjective well-being has, however, been criticized. It has been argued that, "not all outcomes that a person might value – would yield well-being when achieved. Even though they are pleasure producing, some outcomes are not good for people and would not promote wellness" (Ryan & Deci, 2001, pp. 145-146). As a result, the hedonic approach has been contrasted with the eudaimonic view that well-being is a function of living according to one's authentic self (Ryan & Deci, 2001) and realizing one's true potential (Compton, 2005) by deriving meaning and cultivating personal growth (Searle, 2008).

Adopting a eudaimonic perspective, Ryff and Keyes (1995) postulated that subjective well-being insufficiently represented psychological wellness by neglecting key aspects of positive functioning. Since the balance of positive and negative emotions and life satisfaction only partially accounted for well-being, Ryff and Keyes (1995) proposed a multidimensional

model of psychological well-being based on the following six distinct core dimensions of positive psychological functioning:

- (a) Positive evaluations of oneself and one's past life (Self-Acceptance);
- (b) A sense of continued growth and development as a person (Personal Growth);
- (c) The belief that one's life is purposeful and meaningful (Purpose in Life);
- (d) The possession of quality relations with others (Positive Relations With Others);
- (e) The capacity to manage effectively one's life and surrounding world (Environmental Mastery);
- (f) A sense of self-determination (Autonomy).

A table outlining indicators of high and low functioning within each of these dimensions is provided in Appendix A. In a recent article, Ryff (2013) further situated these dimensions within their theoretical foundations, which are also featured within this table. Although there is no clear consensus on whether or not the hedonic or the eudaimonic approach is the most salient conceptualization of well-being, there is agreement that well-being (a) is not simply the absence of negative psychological factors (Searle, 2008), (b) is considered to be both a state and a process that is complex and multifaceted, fluctuating over time, and influenced by layers of contexts embedded within an individual's life (Haworth & Hart, 2007), and (c) varies across individuals, demographics, and settings (Searle, 2008). According to Compton (2005), well-being can be characterized by aspects of both eudaimonic and hedonic conceptions, each of which are mutually reinforcing. Furthermore, Ryan and Deci (2001) suggested, "that the hedonic and eudaimonic foci are both overlapping and distinct and that an understanding of well-being may be enhanced by measuring it in differentiated ways" (p. 148). As such, both eudaimonic and hedonic views were used to conceptualize and measure well-being in the current study.

Self-Regulation

Another concept that has been linked to the field of positive psychology is that of self-regulation. Although self-regulation has been studied across multiple contexts including psychology (e.g., Carver & Scheier, 1998; Vohs & Baumeister, 2004), education (e.g., Boekaerts & Niemivirta, 2000; Winne & Perry, 2000), and health (e.g., Leventhal, Brissette, & Leventhal, 2003; Maes & Gebhardt, 2000), the role self-regulation plays in the achievement and maintenance of well-being of individuals, including physicians, has not been extensively investigated.

Overall, two major paradigmatic stances can be identified in the literature to explain self-regulation, that is, the cybernetic systems paradigm and the social-cognitive paradigm. While the social-cognitive paradigm guided the present study, the cybernetic systems view will be briefly discussed in light of its foundational relevance to most contemporary self-regulation theories and models, including social-cognitive ones. The cybernetic systems paradigm is based on Weiner's (1948) seminal work with Cybernetic Systems Theory (CST). Defining cybernetics as the scientific study of control and communication in the animal and the machine (1948), Weiner (1948) postulated that the purpose of self-regulating systems (e.g., in an animal or machine) is to minimize discrepancies between environmental inputs and internal standards, which serve as reference points (Edwards, 1998). This basic mechanism of feedback loop systems is perhaps the most influential principle in the self-regulation literature to date (Vancouver, 2000), and gave rise to more contemporary adaptations to address the self-regulation of human behavior, often under the rubrics of Control Theory (e.g., Carver & Scheier, 1998; Powers, 1973), and social-cognitive approaches (e.g., Bandura, 1991; Zimmerman, 2000).

Shifting the focus of Weiner's SCT on organic (living) and inorganic (machine) regulation to human behavior regulation, Powers Control Theory (PCT; Powers, 1973) was developed to explain that behavior is not the sole effect of antecedent causes in the environment, but also that of 'perception control' (e.g., we seek to control, via our behavior, the types of stimuli we perceive). The aim is to create states where these perceived stimuli match internally held standards (Nelson, 1993; Powers, 1973). As a direct expansion of PCT, Carver and Scheier's Control Theory (CT; 1998) (Nelson, 1993; Vancouver, 2000), involves complex self-regulatory systems, namely negative discrepancy feedback-loop control systems and goal systems. Feedback-loop control systems in CT consist of four basic elements: An input function (e.g., perception of current conditions), a reference value (e.g., goal/standard), a comparator (e.g., cognitive mechanism that compares the input to the reference value and discerns if there is a discrepancy) and an output function (e.g., equivalent to behavior) (Carver & Scheier, 1998). Negative feedback loops occur when individuals become aware of discrepancies between their current and desired reference values (e.g., goals) (Carver & Scheier, 1998; Vohs & Baumeister, 2004), and consciously engage in actions to reduce such discrepancies (Fitzsimons & Bargh, 2004). Goal systems are central to feedback-loop systems given that individuals typically live their life by identifying goals and behaving in ways that are aimed at attaining these goals (Scheier & Carver, 2003). Goals (i.e., reference values) can be relatively constant, recurring, or can be 'moving targets'. Nonetheless, discrepancy reducing feedback-loops serve to continuously lead individuals to match their perceived (i.e., current) reality with their goals (Carver & Scheier, 2000).

In spite of its widespread empirical use (e.g., Hustad, Carey, Carey, & Maisto, 2009; Sosik, Potosky, & Jung, 2002), several criticisms of CT have been put forth, namely its overly

mechanistic nature that neglects the more dynamic and complex elements that influence human behavior (e.g., socialization), and its exclusive focus on discrepancy reduction within feedback-loop systems (Bandura, 1991). It is also difficult to apply CT in dynamic and applied research environments (Vancouver, 2000) and authentic contexts (Zimmerman, 2000) – likely due to its mechanistic nature. Its focus on discrepancy reduction is also somewhat counter-intuitive to the thesis of positive psychology, advocating that individuals proactively increase positive experiences and not only reactively reduce negative experiences (Seligman & Csikzentmihalyi, 2000).

In an attempt to compensate for the shortcomings of CT (Carver & Scheier, 1998), social-cognitive approaches were put forth, which emphasize the importance of not only internal thoughts and feelings, but also external socializing agents, and the reciprocal effect these have on an individual's behavior and development of self-regulation processes (Zimmerman, 2000). Within these approaches, self-regulation is viewed as a capacity or skill that can be developed, implemented, and cyclically adapted in order to achieve personal standards (Bandura, 1991; Zimmerman, 2000). Such approaches include the Social-Cognitive Theory of Self-Regulation (SCT, Bandura, 1991) and the Social-Cognitive Model of Self-Regulated Learning and Performance (SCM, Zimmerman, 2000). Appendix B provides a visual representation of the SCT transposed onto the cyclical phases of the SCM.

Social cognitive theory. The SCT of self-regulation (Bandura, 1991) includes a number of subsidiary, multifaceted, cognitive processes targeting both proactive and reactive feedback-loop systems. Expanding on Control Theory (Carver & Scheier, 1998), SCT moves beyond simple discrepancy reduction, viewing self-regulation as an active dual-control process in which

individuals use their self-reflective and self-reactive capabilities to anticipatorily exert adaptive control over their thoughts, feelings, and actions, rather than simply react to their efforts.

According to Bandura (1991), individuals regulate behavior via the following three main sub-functions that operate within an interconnected, dynamic, and cyclical process: self-monitoring, judgmental, and self-reaction sub-functions. The self-monitoring sub-function is a process in which behaviour, its determinants, and its effects are monitored. During self-monitoring, one uses self-diagnostic processes such as self-observation to collect information to be able to set realistic standards and evaluate progress towards the attainment of these standards through the judgmental sub-function (described in the next paragraph). Self-observation mediates the self-motivating function, which stipulates that an individual's level of motivation affects the amount of effort invested into attaining personal standards. Self-monitoring, however, provides little basis for determining how individuals react to their experiences (Bandura, 1991).

Based on the information gathered using self-monitoring processes, the judgmental sub-function involves evaluating behaviour in relation to personal standards. Specifically, it comprises several subsidiary processes such as the development of personal standards (e.g., based on social modeling and direct experience), the valuation of activities (e.g., how much value is placed on a given activity, influencing the investment of personal resources towards goals perceived to have a direct impact on personal well-being), and the identification of performance determinants (e.g., perception of the degree of control one has over his behavior or an outcome) (Bandura, 1991).

The self-reactive sub-function reflects the use of mechanisms to regulate actions based on evaluations from the aforementioned judgmental processes. After performance judgments are set, individuals achieve self-regulation by creating incentives (e.g., self-satisfaction, benefits such as

free time) for their actions, because they will likely pursue actions that will produce positive self-reactions. When individuals “make self-satisfaction or tangible benefits conditional upon certain accomplishments, they motivate themselves to expend the effort needed to attain the requisite performances” (Bandura, 1991, p. 256). In fact, one of the factors that differentiate those who succeed in regulating their motivation and behavior in pursuit of their goals from those who are unsuccessful is the effective use of self-incentives (Zimmerman, 1989). Ultimately, self-reactions give direction to one’s behavior, a sense of motivation, and also affect how much satisfaction people derive from what they do (Bandura, 1991).

An important proximal determinant in the overall process of self-regulation is the self-efficacy mechanism, which strongly influences individuals' cognitive processing, affect, motivation, and actions (Bandura, 1991). For example, highly efficacious individuals tend to better self-regulate in the face of barriers by proactively developing personal standards and displaying commitment, effort, and perseverance (Bandura, 1986). Essentially, self-efficacy helps to explain why individuals react differently than others to similar standards and experiences (Bandura, 1986; Vancouver, 2000).

The sub-functions of self-regulation in SCT (Bandura, 1991) operate through feedback loop systems, much like those related to negative discrepancy reduction (Carver & Scheier, 1998). However, a major point of divergence relates to added proactive (i.e., positive discrepancy reduction) in addition to reactive (i.e., negative discrepancy reduction) mechanisms. Essentially, proactive processes enable individuals to anticipate situations and exert adaptive control rather than simply reacting to efforts after situations have occurred. For example, individuals may be motivated to attain a new set-standard, which creates a state of disequilibrium

or generates a discrepancy. Proactive feedback loop systems then lead individuals to reduce the discrepancy between current and desired standards (Bandura, 1991).

There are several limitations of the SCT. Given its complex and comprehensive nature, the lack of clarity and depth regarding the role of emotion is somewhat surprising. The specific mechanisms underlying the regulation of emotions in the overall process of self-regulation seem to be under-represented in Bandura's theory. In contrast, most other contemporary self-regulation frameworks (e.g., Control Theory, Carver & Scheier, 1998) address the role of emotions. Furthermore, since the SCT of self-regulation is so broad, in the interest of feasibility, many researchers only include one or a few social-cognitive variables in their studies. As such, the SCT does not appear to be a parsimonious framework that can be easily implemented in research or used to guide practice.

Social-cognitive model. As a simplified, clearer conceptualization of SCT (Bandura, 1991), Zimmerman (2000) developed the SCM of self-regulation. Preserving the essence of the SCT, the SCM addresses the interdependent roles of social (e.g., interpersonal relationships), environmental (e.g., working conditions), and personal (e.g., thoughts and emotions) influences. Focusing predominantly on outcomes related to learning (Boekaerts & Niemivirta, 2000), Zimmerman defined self-regulation as a cyclical process involving, "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (p. 14). Similar to Bandura's SCT (1991), the quality of this process hinges on one's beliefs and motives. Also, feedback information from previous performances is used to make proactive adjustments during current and future efforts of regulation. Thus, behavioral factors are constantly changing during learning and performance within one's evolving social and physical environments (Zimmerman, 2000).

Adapted from the three sub-functions of the SCT of self-regulation, the SCM comprises three phases: forethought, performance, and self-reflection (see Appendix B). The forethought phase consists of two sub-processes: (a) task analysis (e.g., setting standards, specific outcomes, and strategic plans), and (b) self-motivational beliefs (e.g., determining self-efficacy, outcome expectations, intrinsic interest, and goal orientations, Zimmerman, 2000). Task analysis and motivational beliefs are related to the SCT (Bandura, 1991), specifically the judgmental sub-function (i.e., development of personal standards and valuation of activities). The SCM shares emphasis on the role of self-efficacy, and the importance of forethought in the form of proactive control (Bandura, 1986).

The performance phase of the SCM consists of three sub-processes: (a) self-control, which reflects an individual's ability to maintain focus on the current task, and optimize efforts toward goal attainment through task strategies and self-instruction, (b) self-observation, which consists of observing and tracking specific aspects of one's performance and environment during task completion, and subsequent efforts produced in response to such data (e.g., meta-cognitive monitoring), and (c) self-recording, which involves the use of techniques to enhance the effectiveness and accuracy of feedback and leads to self-awareness by providing relevant data that can be synthesized into future adapted strategies (Zimmerman, 2008; Zimmerman & Kitsantas, 1996). This phase is analogous to the self-monitoring sub-function of the SCT, specifically the self-observation process (Bandura, 1991). However, although Bandura discusses the importance of self-observation, Zimmerman moved beyond this sub-process to include self-control. In doing so, he addressed a limitation of the SCT by depicting how individuals enact task strategies while they perform.

The self-reflection phase of the SCM occurs after performance efforts and involves comparing self-monitored data with personal standards, and assigning causal attributions to explain achieved outcomes (e.g., judge performance to be the result of one's level of ability or level of effort). Self-reflection is also linked with two forms of self-reaction: (a) self-satisfaction (e.g., perceptions of either satisfaction or dissatisfaction regarding one's performance), and (b) adaptive inferences (e.g., subsequent conclusions about how to improve future regulatory attempts, Zimmerman, 2000). Like the forethought and performance phases, self-reflection is also analogous to processes from the SCT (Bandura, 1991). Self-reaction, specifically self-satisfaction, reflects Bandura's self-reactive sub-function. Zimmerman implicated the judgmental sub-function of SCT by including causal attributions, which are referred to as perceived performance determinants by Bandura (1991).

In terms of limitations, as with Bandura's (1991) SCT, Zimmerman's (2000) SCM also does not adequately address emotion. However, Zimmerman (2000) did mention based on Bandura's (1991) work that "self-perceptions of self-satisfaction or dissatisfaction are associated with one's affect regarding one's performance, which is important because people pursue courses of action that result in satisfaction and positive affect, and avoid those courses that produce dissatisfaction and negative affect" (p. 25). Another limitation pertains to the applicability of the model in research and practice given its multiple phases, processes, and sub-processes. Nonetheless, it is important to note that the SCM is more parsimonious than the SCT and it has been integrated in past studies.

Although Bandura's (1991) SCM and Zimmerman's (2000) SCM have seldom been used in health-related research, several processes are described in the health domain that can be linked to self-regulation processes found in these two frameworks. One example is self-assessment,

which is the process of interpreting internal and external data about one's performances and comparing them to explicit or implicit standards (Epstein, Siegel, & Silberman, 2008; Eva & Regehr, 2005). According to these authors, self-assessment is essential to assess medical errors and quality of care, and nurture future learning in clinical practice.

Another self-regulatory process addressed in the medical literature is self-monitoring, which refers to, "self-awareness of thoughts, feelings, emotions, and sensations – to facilitate access to cognitive processes, and therefore the ability to change behavior" (Epstein et al., 2008, p. 6). Since self-monitoring involves self-judgments of one's actions and mental processes, it can be associated with self-appraisal processes used to assess subjective well-being (e.g., appraisal of life satisfaction and positive and negative affect, Diener, 1984) and psychological well-being (e.g., appraisal of personal growth dimension of positive functioning, Ryff & Keyes, 1995). Finally, the concept of resilience resonates with many aspects of self-regulation, and features prominently in the physician wellness literature (Arnetz, 2001; Gautam, 2009). Epstein and Krasner (2013) argue that it is not enough to recognize that threats to wellness in medicine exist, physicians must also realize the degree to which they can regulate their own cognitive, emotional, and somatic reactions in their attempts to address these threats. Overall, the extent to which physicians can self-regulate using processes related to self-assessment, self-monitoring, and resilience warrants additional research as self-regulatory capacity may impact their well-being. Given the limitations of existing self-regulation studies in the health field, it would appear to be important to examine physicians' self-regulation from a broader multidimensional perspective in order to provide insight into several processes deemed important to achieve performance and well-being related goals.

In sum, in light of the complementary and comprehensive nature of Bandura (1991) and Zimmerman's (2000) conceptualizations of self-regulation, both the SCT and the SCM were used to guide the present study in which physicians' self-regulation capacity and experiences were examined in relation to their well-being. Self-regulation was viewed as a cyclical process of disequilibrating discrepancy production (Bandura, 1991) and equilibrating discrepancy reduction (Carver & Scheier, 1998) through both proactive (e.g., forethought) and reactive control (e.g., self-reflection) (Zimmerman, 2000). Furthermore, given the gaps regarding research on physician well-being, both hedonic and eudaimonic views of well-being were considered when devising the current study. In order to provide a wide-ranging focus on positive functioning, Ryff and Keyes' (1995) multidimensional model of psychological well-being was utilized.

Rationale and Purpose of the Study

The overarching purpose of this study was to examine the well-being and self-regulation capacity of physicians. As previously mentioned, while the well-being of physicians has become an important area of interest and research (Canadian Medical Association 1998, Puddester, 2001), the majority of this research has been overwhelmingly pathological in nature (Weiner et al., 2001). Little to no emphasis has been placed on well-being with respect to perspectives put forth by the WHO (2009) and positive psychology researchers (e.g., Seligman & Csikszentmihalyi, 2000). This study addressed this gap by examining well-being and self-regulation from a positive psychology viewpoint to provide a more holistic account of physicians' experiences (Seligman & Csikszentmihalyi, 2000). With a more complete conceptualization of well-being, this study also explored the role that self-regulation may play in the well-being of physicians. Since physicians routinely work in a dynamic, challenging, and social environment (Sotile & Sotile, 2002), the interacting psychological and social dimensions

of self-regulation addressed in Bandura's (1991) SCT and Zimmerman's (2000) SCM are relevant for the medical context.

This mixed methods study involved two phases. The quantitative phase (Phase 1) served to give insight into physicians' levels of psychological and affective well-being, and self-regulation capacity. Furthermore, relationships between these variables and the influence of status (physicians versus resident physicians) were explored. The qualitative phase (Phase 2) focused on the physicians' experiences of well-being and self-regulation. Factors the physicians perceived to enhance and inhibit their well-being and self-regulation capacity were examined, as well as the role they observed their self-regulation capacity to play in their well-being. Specifically, the following research questions were addressed:

Phase 1

- (a) What is the level of psychological and affective well-being of physicians?;
- (b) What is the level of self-regulation capacity of physicians?;
- (c) What is the relationship between physicians' levels of psychological and affective well-being and self-regulation capacity?;
 - a. Can physicians' level of self-regulation capacity significantly predict their level of psychological well-being?;
- (d) Does status (i.e., physicians versus resident physicians) influence the relationship between affective and psychological well-being and self-regulation capacity?;
 - a. Are there significant differences in psychological and affective well-being between physicians and resident physicians with high and low self-regulation capacity?

Phase 2

- (a) How do physicians experience psychological well-being and self-regulation?;
 - i. What are physicians' experiences of psychological well-being (i.e., high and low functioning with regards to autonomy, environmental mastery, positive relations with others, personal growth, self-acceptance, purpose in life)?;
 - ii. How do physicians experience self-regulation (i.e., forethought, performance, self-reflection phases of self-regulation)?;
- (b) What role do physicians perceive their self-regulation capacity to play in their well-being?;
- (c) What enhances and inhibits physicians' well-being?;
- (d) What enhances and inhibits physicians' self-regulation capacity?

PART II

Part two is divided into three sections: (a) supplemental methodology, (b) feature articles, and (c) supplemental results. Each feature article includes a methods section, however, in light of the space constraints imposed by academic journals, a supplemental methodology section was included to provide additional pertinent information and elaborate on certain methodological procedures. Specifically, this section addresses the mixed methods research design and the pragmatic stance guiding this study, standards of quality, additional participant demographics, selection procedures for Phase 2, and details regarding the exploratory factor analysis. The next section presents three full-length articles that were submitted to peer-reviewed journals. For clarity purposes, it may be valuable to refer to the feature articles when reading the aforementioned supplemental methods section, as the latter was meant to complement the content of the articles. The supplemental results section presents relevant data that were not included in the feature articles.

Supplemental Methodology

Research Design

A mixed methods design was chosen to guide the present study as it allowed for the collection and analysis of both quantitative and qualitative data within a multi-phase study (Creswell & Plano-Clark, 2007). In the present context, this was deemed important for increasing understanding in a relatively new area of research (Creswell, 2003; Hanson, Creswell, Plano-Clark, Petska, & Creswell, 2005), that is, physicians' well-being and self-regulation capacity.

Explanatory design: Participant selection model. Based on Creswell's (2003) criteria for selecting a mixed methods research design (i.e., implementation sequence, priority of qualitative and quantitative data, and integration of data), the participant selection model, which

is a variation of the sequential explanatory design, was implemented in the current study (Creswell & Plano-Clark, 2007). An explanatory design involves a two-phase (hereinafter referred to as Phase 1 and Phase 2, respectively), sequential, mixed methods process. In the current study, Phase 1 involved the collection and analysis of quantitative data, which was followed by the collection and analysis of qualitative data in Phase 2. In the case of the participant selection model variation, the quantitative data were prioritized as they were used to purposefully select participants for Phase 2, in which more in-depth qualitative data were gathered. Both quantitative and qualitative data were subsequently integrated and analyzed through a composite analysis (Creswell & Plano-Clark, 2007). The opportunity to link quantitative and qualitative data in the composite analysis is a notable strength of a mixed methods design.

There is value in visually depicting the multiple stages of a mixed methods study using Creswell's (2003) criterion (e.g., sequence of data collection, qualitative and quantitative priority, and connecting points during the process). Appendix C includes a figure based on the 10 rules for presenting a mixed methods model (Ivankova, Creswell, & Stick, 2006). It summarizes the multi-phase format of the participant selection model of the sequential explanatory, mixed methods design used in the present study.

Paradigmatic Stance

In the design of a mixed methods study, it is important to be aware of the potential alternative stances on worldviews, and articulate which one is being taken (Creswell & Plano-Clark, 2007). In contemporary designs, one of the most common stances is pragmatism. This stance has been widely endorsed (Hanson et al., 2005; Yardley & Bishop, 2008) and informed the present study. Resisting the need to dichotomize quantitative (e.g., post-positivist) and

qualitative (e.g., constructivist) research paradigms within mixed methods research (Tashakkori & Teddlie, 2003), pragmatists maintain that while there are philosophical differences and assumptions between different paradigms of inquiry, these are logically independent (i.e., mutually exclusive). The aim of pragmatic inquiry is, “not to seek a truth that is independent from human experience, but to achieve a better, richer experience ...” (Yardley & Bishop, 2008, p. 355). As such, little consequence is given to the inherent contradictions between quantitative and qualitative research paradigms. In essence, the relevance of philosophical groundings is acknowledged, but their importance is minimized in comparison with practical or contextual demands of the research problem (Greene & Caracelli, 1997; Hanson et al., 2005). Viewing the research questions as the central determinants of a research design, and embracing the inclusion of quantitative and qualitative approaches, pragmatists put the research in the best position to elicit desired pluralistic outcomes (Tashakkori & Teddlie, 2003).

Standards of Quality

A common nomenclature is used to address standards of quality in mixed methods designs (e.g., inference quality and transferability). Inference quality refers to the accuracy and authenticity of the data and interpretations (e.g., internal validity and credibility), and inference transferability represents concepts of external validity used in quantitative research and transferability used in qualitative research (Creswell & Plano-Clark, 2007; Tashakkori & Teddlie, 2003).

Creswell and Plano-Clark (2007) outlined potential threats to quality when using “within sequential explanatory designs” and suggested procedures to minimize these threats. In the present study, inference quality and transferability were maximized by triangulating and integrating the quantitative and qualitative data (Hanson et al., 2005). Threats were also

minimized by: (a) using valid and reliable self-report measures in Phase 1 and a thorough interview guide developed based on well-documented frameworks in Phase 2, (b) including an adequate number of participants in both phases, and selecting participants for Phase 2 based on rigorous procedures, and (c) using thorough data analysis and interpretation procedures (e.g., exploratory factor analysis in Phase 1, qualitative content analysis, member checking, peer debriefing in Phase 2) (see Feature Articles 1, 2, and 3 and General Discussion for more details).

Participant Demographics

Although each feature article provides a general overview of the participants, data regarding additional demographic variables were collected and included here in the interest of providing a comprehensive view of the sample. There were a total of 132 online survey participants in this study, including 40 physicians and 92 resident physicians. The average number of years of experience (i.e., medical practice) was 20 years ($SD = 10.28$) for physicians and 2.4 years ($SD = 1.5$) for resident physicians. Following are the number of participants within each age bracket: 20-29 years ($n = 71$; 53.8%), 30-39 years ($n = 30$; 22.8%), 40-49 ($n = 10$; 7.5%), 50-59 years ($n = 15$; 11.3%), 60-69 ($n = 5$; 3.8%), and 70-74 ($n = 1$; 0.8%).

Since online survey participants were recruited through provincial and territorial medical associations and the promotion of the study was left at their discretion, there was a disproportionate number of respondents from certain provinces and there were none from the three territories (i.e., Northwest Territories, Yukon, and Nunavut). The highest number of participants were from Alberta ($n = 41$; 31.8%), Saskatchewan ($n = 31$; 24%), Atlantic Canada (Newfoundland and Labrador, Nova Scotia, New Brunswick, and Prince Edward Island, $n = 18$; 14%), and Ontario ($n = 16$; 12.4%). The remaining 17.8% were divided between Quebec, British Columbia, and Manitoba. In terms of marital status, just over 75% of the participants identified

themselves as either “married” (56%) or “in a committed relationship” (20%). Finally, an overwhelming majority (89.8%) practiced in urban as opposed to rural (10.2%) settings, and 85.7% practiced in hospital settings, while 14.3% worked in private practice.

Participant Selection Procedures for Phase 2

As previously discussed, the research design employed in this study was the participant selection model of a sequential explanatory design (Creswell & Plano-Clark, 2007). As such, the quantitative results in Phase 1 of the study (see Feature Articles 1 and 2 for participant selection details for Phase 1) were used to select the participants in Phase 2. This means that the same sample of participants was utilized for both phases of this research. More specifically, the selection of participants for the in-depth interviews in Phase 2 was completed following a multi-step process based on participants' scores on the Scales of Psychological Well-Being (SPWB, Ryff & Keyes, 1995) and the Short Form Self-Regulation Questionnaire (SSRQ, Carey, Neal, & Collins, 2004) completed in Phase 1 (see Feature Articles 1 and 2 for a description of these questionnaires and the participants' scores).

In the first step, data from the SPWB and SSRQ were filtered to isolate only those cases who (a) agreed to participate in Phase 2, and (b) completed both the SPWB and SSRQ ($n = 79$). Next, a quartile split of the data using participants' total scores on the SPWB (i.e., aggregate score) and SSRQ was performed. Note that ‘High’ and ‘Low’ scores were relative only to those participants within the sample. For example, a physician categorized in the ‘Low’ quartile for self-regulation capacity did not necessarily possess poor self-regulation skills when compared to norms, but rather was considered ‘Low’ in relation to the other physicians included in the sample.

An important goal of the participant selection process for Phase 2 was to elicit maximum variation (Creswell & Plano-Clark, 2007) and include participants with a range of well-being and self-regulation capacity levels. Given the limited literature on physician well-being and self-regulation and the exploratory nature of the research, it was deemed important to gather data from physicians with both high and low well-being and self-regulation capacity. Furthermore, even though well-being was examined from a positive psychology perspective, Ryff and Keyes delineated a range of functioning (i.e., high and low) within each dimension of psychological well-being. As such, to gain more insight into physicians' possible range of functioning, it was important to include those with high and low scores on psychological well-being. To achieve this, the four following groups of participants were generated, which focused on the top and bottom quarters of the data:

1. Quartile Group 1 - low well-being (bottom $\frac{1}{4}$) and low self-regulation capacity (bottom $\frac{1}{4}$) ($n = 11$);
2. Quartile Group 2 - high well-being (top $\frac{1}{4}$) and low self-regulation capacity (bottom $\frac{1}{4}$) ($n = 8$);
3. Quartile Group 3 - high well-being (top $\frac{1}{4}$) and high self-regulation capacity (top $\frac{1}{4}$) ($n = 12$);
4. Quartile Group 4 - low well-being (bottom $\frac{1}{4}$) and high self-regulation capacity (top $\frac{1}{4}$) ($n = 8$).

The next step involved selecting the participants within each quartile group. Participants were ordered in each group based on their identification number and not their well-being or self-regulation capacity scores. This was an important step as it maximized the chances that all participants would be selected within each group. The primary researcher, who was also the

interviewer in Phase 2, did not participate in this step in order to reduce any potential bias resulting by being privy to the groups in which participants were categorized.

Participants within each group were contacted via email by an independent researcher following the ordered identification numbers from top to bottom. When one participant responded favorably, his or her contact information was forwarded to the primary researcher to schedule a time for the interview. The independent researcher then contacted the next participant on the list until four participants within each of the four groups agreed to partake in the interview, for a total of 12 participants in Phase 2. When a participant did not respond after one week, a reminder e-mail was sent. Failure to respond to this reminder email within one week time frame resulted in the participant being labeled as a “no-response”, and the next participant on the list was contacted.

Exploratory Factor Analysis and Transformation of Data

The following section provides additional details regarding the Exploratory Factor Analysis (EFA) conducted on the self-regulation questionnaire (SSRQ, Carey et al., 2004) data due to its limited use in research with physicians. The EFA served to reproduce the 31-item one-factor structure of the SSRQ. A fixed one-factor solution, using principal component analysis as the extraction method was applied to the scores of the 132 physicians who responded to the SSRQ.

Although cut-off points for item loadings can vary, items below 0.4 were removed in this analysis, as it was the criterion used when testing the original SSRQ' psychometric properties (Carey et al., 2004). Initially, six of the 31 original items loaded below 0.4 and the total variance explained was only 24.3%. Thus, items that loaded below 0.4 were systematically removed through a recursive process to see if the amount of variance explained could be improved. This

process continued a total of six times, at which point the removal of additional items did not increase the total variance explained (31.77%). Appendix D summarizes the recursive steps taken, including the number of items that were entered, the items that were dropped, and the variance explained, for each step.

After examining the remaining 19 items, it was decided that further item removal would compromise the theoretical integrity of the original 31-item scale. In Appendix E, each of the 19 items are linked to a self-regulation process or sub-process from Bandura's SCT (1991) and Zimmerman's (2000) SCM (see Appendix B for an integration of Bandura's and Zimmerman's frameworks) in order to demonstrate that the 19 item questionnaire conceptually captured general self-regulation capacity. As can be seen from Appendix E, the majority of processes and sub-processes were addressed by the revised 19-item SSRQ.

The sampling adequacy (KMO) and sphericity (Bartlett's test) were above recommended norms for both the original 31-item and revised 19-item SSRQ, indicating favorable factorability. The internal consistency (.874) of the revised scale was favorable, and close to the value reported for the original 31-item SSRQ (.92). Overall, the results of the EFA, as well as the approximate normal distribution of the data, demonstrated appropriateness for the analyses conducted in the present study (see Feature Articles 1 and 2).

After the SSRQ was deemed appropriate, it was necessary to transform self-regulation capacity from a continuous to a categorical variable (i.e., high and low levels of self-regulation capacity) in order to perform the statistical analyses reported in Feature Article 1 (i.e., MANOVAs). This was achieved by conducting a quintile split. The first ($n = 30$; 22.7%) and second ($n = 21$; 15.9%) quintiles represented low self-regulation capacity, while the fourth ($n = 29$; 22%) and fifth ($n = 27$; 20.5%) quintiles represented high self-regulation capacity. The third

quintile ($n = 25$; 18.9%) was discarded in order to clearly differentiate between high and low self-regulation capacity. The quintiles were then re-coded into two levels: high self-regulation capacity ($n = 56$; fourth and fifth quintiles), which accounted for 42.4% of the data, and low self-regulation capacity ($n = 51$; first and second quintiles), which accounted for 38.6% of the data. Together, these accounted for 80.7% ($n = 107$) of the self-regulation capacity data set. Despite the discarded third quintile, there were still an adequate number of participants remaining to conduct the MANOVAs (Garson, 2012).

Feature Articles

In light of the article format used to present the results of this thesis, the following section includes three feature articles. The first article titled *Differences in psychological and affective well-being between physicians and resident physicians: Does high and low self-regulation capacity matter?*, emerged from Phase 1 and addresses the level of self-regulation capacity and psychological and affective well-being of physicians and resident physicians. It also provides insight into differences in psychological and affective well-being between physicians and resident physicians with high and low self-regulation capacity. This article was published in the journal *Psychology of Well-Being: Theory, Research, and Practice*⁴. The second article, titled *Does self-regulation capacity predict psychological well-being in physicians?*, was also based on results from Phase 1 and focuses on whether or not self-regulation capacity can significantly predict psychological and affective well-being in physicians. It was accepted for publication in the journal *Psychology, Health, and Medicine*, and is now published online⁵. Finally, the third article entitled *A qualitative exploration of physicians' psychological well-being*, emerged from Phase 2 of the study and presents the in-depth experiences of well-being of physicians. It has been submitted for publication in the *Journal of Occupational Health Psychology*. Note that the articles are presented in the format requested by the journals to which they have been submitted for publication so they do not necessarily follow APA guidelines. Appendix F summarizes the research questions addressed in each of the three feature articles and the supplemental results section, the latter of which is included after the feature articles.

⁴ Reference: Simon, C. R. & Durand-Bush (2014). Differences in psychological and affective well-being between physicians and resident physicians: Does high and low self-regulation matter? *Psychology of Well-Being: Theory, Research, and Practice*, 4, 1-19.

⁵ Reference: Simon, C. R. & Durand-Bush (2014). Does self-regulation capacity predict psychological well-being in physicians? *Psychology Health, and Medicine*. doi: 10.1080/13548506.2014.936887

Feature Article 1

Differences in psychological and affective well-being between physicians and resident physicians: Does high and low self-regulation capacity matter?

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Differences in psychological and affective well-being between physicians and resident physicians: Does high and low self-regulation capacity matter?

Abstract

Background: Physician well-being has rapidly become an important area of interest given that reduced well-being can have a negative effect on patient outcomes. The majority of studies in this area have focused on impairment, and research on skills and processes that allow physicians and resident physicians to achieve and maintain adequate levels of well-being has been limited. As such, the purpose of the present study was to adopt a positive psychology approach to investigate well-being as more than the presence or absence of dysfunction. It aimed to examine the link between self-regulation capacity, an important self-management skill, and psychological and affective well-being among physicians and resident physicians. **Methods:** A total of 132 physicians and resident physicians completed online questionnaires assessing their levels of psychological and affective well-being and self-regulation capacity in order to determine if there were significant differences in well-being between physicians and resident physicians with high and low self-regulation capacity. **Results:** Physicians and resident physicians had moderate and high levels of self-regulation capacity, respectively. While both groups were generally high in psychological well-being, they had average levels of positive and negative affect. Between-subject MANOVAs confirmed the hypothesis that high self-regulating physicians and resident physicians have higher levels of psychological well-being and positive affect compared to those with lower levels. However, those higher in self-regulation capacity did not have lower negative affect, nor did physicians have significantly higher levels of psychological and affective well-being than resident physicians. **Conclusions:** Results do not support some of the literature suggesting that physicians are highly distressed and cannot manage the demands of their

profession. The positive significant association between the physicians and resident physicians' self-regulation capacity and well-being implies that nurturing self-regulation skills within this population could potentially be one way to help them adapt to meet the evolving demands of the medical profession.

Keywords: psychological well-being; affect; positive psychology; self-regulation capacity; physician; resident; health and wellness

Background

Physician Health and Well-Being: A Focus on Impairment

The knowledge and skills physicians derive from years of intensive and committed medical training have prepared them to meet the medical challenges of their patients. However, physicians often lack the skills to effectively manage themselves and their environment (Shanafelt et al. 2003), which could arguably impact their well-being and that of their patients. Although well-being is relevant in any work environment, its importance is underscored in the practice of medicine as this context involves making critical decisions regarding individuals' health (Uncu et al. 2006). Reduced well-being among physicians has been found to have a negative effect on patient outcomes and quality of overall care (Shanafelt et al. 2002; Taub et al. 2006). In response, calls have recently been made to prioritize the health and well-being of physicians (Krasner et al. 2009).

From a research perspective, physician wellness is a rapidly growing field, however, to date, the majority of studies have focused on impairment and dysfunction (Compton 2005), with burnout being the most prevalent theme (e.g., Diez-Pinol et al. 2008; Shanafelt et al. 2003). It is noteworthy that studies on physician well-being often include resident physicians (i.e., physicians undergoing their post-graduate medical education training) as the well-being of this

subset of physicians has also become a developing area of interest (Williams et al. 2002).

Mirroring the results of studies with physicians, negative outcomes such as burnout (Bragard et al. 2010), stress (Daly and Willcock 2002), and anxiety (Michels et al. 2003) have been observed in resident physicians. Furthermore, low resident wellness has also been associated with reduced quality of patient care (Firth-Cozens and Greenhalgh 1997). Again, similar to their physician counterparts, these negative outcomes have been linked to influencing factors such as lack of sleep and long work hours (Rosen et al. 2006), high expectations (Cohen and Patten 2005), and reduced work-life balance (Eckleberry-Hunt et al. 2009).

Nevertheless, despite inherent nuances between physicians and resident physicians (e.g., level of experience and expertise), it is surprising that few studies have targeted potential differences by comparing and contrasting their levels of well-being. Existing studies tend to focus on single or few wellness-related variables and do not compare the levels of well-being of physicians and resident physicians across multiple dimensions. For instance, it has been shown that resident physicians often have heavier workloads, lower levels of autonomy (Aasland et al. 2008; Biaggi et al. 2003; Thomas 2004), and a higher risk of burnout (Cohen and Patten 2005; Leiter et al. 2009) compared to more senior physicians. In light of such differences between physicians and resident physicians and the scarcity of research comparing the two groups, the present study aimed to assess and contrast the psychological well-being of physicians and resident physicians.

Psychological and Affective Well-Being: A Positive Psychology Perspective

Although the breadth and depth of physician health and well-being research suggests that a clearer understanding of physician well-being is emerging, it has been argued that little is known about what it means for physicians to be well beyond pathology (Spickard 2001; Weiner

et al. 2001). This has led to research demands emphasizing the positive elements of physician well-being (Shanafelt et al. 2005). Consequently, recent movements in positive psychology (e.g., Seligman and Csikzentmihalyi 2000) were followed in the present study in order to conceptualize well-being as more than the presence or absence of dysfunction (Haworth and Hart 2007). Two mutually reinforcing conceptualizations of well-being were relevant; psychological and affective well-being.

Ryff and Keyes (1995) put forward a comprehensive, multidimensional perspective of psychological well-being, based on six distinct components of positive psychological functioning:

- (a) Positive evaluations of oneself and one's past life (self-acceptance);
- (b) A sense of continued growth and development as a person (personal growth);
- (c) The belief that one's life is purposeful and meaningful (purpose in life);
- (d) The possession of quality relations with others (positive relations with others);
- (e) The capacity to manage effectively one's life and surrounding world (environmental mastery);
- (f) A sense of self-determination (autonomy).

The extent to which individuals experience these dimensions reflects their overall sense of psychological well-being.

Given the considerable support this multidimensional model has received (Carmondy and Baer 2008; Riediger and Freund 2004), and the disproportionate low number of studies that examine physician well-being from a holistic, positive perspective (Spickard 2001; Weiner et al. 2001), the present study on physician and resident physician well-being was conceptualized using Ryff and Keyes' six dimensions of psychological well-being. Interestingly, although Ryff

and Keyes (1995) do not include affect as one of their dimensions in their model, they do not minimize its importance. Since affect plays an important role in one's well-being (Diener 1984; Watson et al. 1988) and in medical practice as well (Wallace and Lemaire 2007), this dimension was also incorporated into the current study. Specifically, affective well-being represents the balance between one's positive (i.e., pleasant emotions) and negative (i.e., unpleasant emotions) affect and one's overall satisfaction with life (Diener and Ryan 2009; Watson et al. 1988).

Although physician well-being has seldom been investigated using an optimal functioning perspective, research in other contexts has consistently demonstrated the positive effect of well-being on different outcomes, which are relevant to the medical profession. Examples include productivity and work performance, quality of social relationships, and mental and physical health (Diener and Biswas-Diener 2008; Keyes and Waterman 2003). Individuals with higher levels of well-being also tend to adopt more positive self-care qualities, and exhibit fewer maladaptive lifestyle and health behaviours (Diener and Ryan 2009; Zimmerman 2000). As such, it seems reasonable to assert that finding ways to help physicians achieve and maintain a high level of well-being may lead to improvements in not only personal health, but the reduction of medical errors (Goldman et al. 2000) and the overall quality of patient care (Shanafelt et al. 2003). Surprisingly, however, the investigation of such skills, processes, and strategies that may be allowing some physicians to maintain adequate levels of well-being has been limited. To address this gap, the present study explored self-regulation capacity as one such variable.

Self-Regulation Capacity

Self-regulation capacity reflects one's competence to self-manage. It involves planning, generating, controlling, and adjusting thoughts, feelings, and actions in order to achieve personal

goals and adapt to one's changing environment. It also takes into account external social agents and the reciprocal effect these have on an individual's behavior (Zimmerman 2000). Self-regulation capacity rests on a series of sub-processes such as goal setting, planning, self-monitoring, and self-reflection (Bandura 1991), which can be developed with attention, effort, and practice (Simon and Durand-Bush 2009; Zimmerman 2000). Of interest is that self-regulation capacity addresses not only how we strive for optimal functioning but also how we cope with adversity and dysfunction. In fact, Vohs and Baumeister (2004) reported that many issues we face on a daily basis involve a failure or an inability to effectively self-regulate. Thus, physicians who experience issues related to their well-being may not be effectively self-regulating – that is, managing their behaviours, feelings, and thoughts that resonate with their desired positive outcomes. Conversely, it also stands to reason that physicians who effectively regulate may be more likely to maintain adequate levels of well-being in the face of adversity (e.g., reduced work-life balance, lack of autonomy). Given the central importance of goal-directed behavior in one's self-regulation capacity (Carver and Scheier 1998; Zimmerman 2000) and the link between goal attainment and well-being (Brunstein 1993), it is not surprising that self-regulation capacity has been viewed as a key variable in psychological functioning and linked to a range of positive well-being outcomes (Baumeister et al. 2006; Sanders and Mazzucchelli 2012).

The concept of self-regulation has been extensively studied across multiple contexts including education (Boekaerts and Niemivirta 2000), and health (Leventhal et al. 2003). In education, self-regulation capacity was linked to several positive outcomes. For example, Hofer et al. (2011) found that university students with pronounced self-regulatory capabilities had higher levels of well-being. Park et al. (2012) observed that self-regulation competence was

significantly related to positive adjustment (e.g., lower depression, anxiety, and stress) among university students. Moreover, Tangney et al. (2004) demonstrated that students' self-control, a central self-regulation sub-process, predicted low psychopathological symptoms, and better interpersonal relationships. The quality of social relationships is equally important for physicians, as reduced well-being affects the physician-patient relationship and quality of patient care (Taub et al. 2006). Conversely, the diminished capacity to self-regulate has been linked to negative well-being outcomes. For instance, Hustad et al. (2009) reported that ineffective self-regulation was a risk factor for adverse consequences related to alcohol use among college students. In the context of health, self-regulation capacity has been investigated more as the ability to cope with and adapt to health threats (Leventhal et al. 2003). With a focus on reducing illnesses rather than achieving optimal functioning, it is not in line with the positive psychology approach utilized in the current study. Nonetheless, Leventhal and colleagues (1998) demonstrated the importance of perception, goals, and social influences in the self-regulation of health threats.

In the context of medical practice, the relationship between self-regulation capacity and the well-being of physicians and resident physicians is virtually unknown. However, three recent studies laid the groundwork for the current investigation. Simon and Durand-Bush (2009) documented the development of self-regulation capacity among medical students participating in a 17-week intervention. Increased capacity was perceived by the students to enhance their medical performance. In another study, Sandars and Cleary (2011) postulated that self-regulation competence offers exciting potential for improving academic and clinical performance in medical students. However, its link to well-being outcomes was not discussed. Perhaps the most relevant research to date was a pilot study conducted by Gagnon and Durand-Bush (2012). This

smaller scale study included 25 physicians and 37 medical students sampled from a single institution. The authors found that self-regulation capacity was not only significantly correlated with psychological well-being, stress, and burnout in medical students and physicians, it also predicted a significant amount of variance in these outcomes. It was thus concluded that self-regulation capacity might be an important skill for medical students and physicians to develop in order to meet the demands of their medical profession.

Purpose and Rationale

As the evidence suggests, developing effective self-regulatory competence may be a proactive means of addressing dysfunctional outcomes and promoting optimal well-being among physicians and resident physicians. In light of this, and the negative effects the rigors of medical training and practice can have on physician well-being (Musselman 2003; Shanafelt 2008), it is surprising that little research has examined the association between self-regulation capacity and well-being in the context of medicine. In order to shed more light on this, the objectives of this study were to: (a) assess the level of psychological and affective well-being and self-regulation capacity of physicians and resident physicians; and (b) determine if there were significant differences in psychological and affective well-being between physicians and resident physicians with high and low self-regulation capacity. For the first objective, Gagnon and Durand-Bush (2012) found that physicians and medical students had moderate levels of psychological well-being as well as moderate to high levels of self-regulation capacity thus it was hypothesized that physicians and resident physicians in the current study would have the same, that is, moderate levels of psychological and affective well-being and moderate to high levels of self-regulation capacity.

For the second objective, based on the findings of Gagnon and Durand-Bush (2012), it was hypothesized that psychological and affective well-being would significantly differ based on self-regulation capacity levels and the participants' status (i.e., physicians versus resident physicians). Specifically, it was anticipated that those reporting a high capacity to self-regulate would also have a higher level of psychological well-being (Ryff and Keyes, 1995) and positive affect, and a lower level of negative affect (Watson et al. 1988). Furthermore, given that the physicians in Gagnon and Durand-Bush's study (2012) had significantly higher levels of well-being than medical students and given that previous studies have shown differences between physicians and resident physicians (Biaggi et al. 2003; Thomas 2004), it was hypothesized that physicians in the current study would have a significantly higher level of psychological well-being and positive affect and a lower level of negative affect than resident physicians who have less experience and expertise.

Methods

Participants

The convenience sample comprised 132 male and female physicians and resident physicians, who were recruited to also partake in a larger study on physician well-being and self-regulation capacity. All participants were required to be either currently practicing medicine or undergoing residency training. While no other delimitations were imposed, the demographics questionnaire revealed that there were twice as more resident physicians ($n = 92$) than physicians ($n = 40$), and there were more women ($n = 86$) than men ($n = 46$). Physicians had an average of 20 years ($SD = 10.28$) of experience, while resident physicians had 2.5 years ($SD = 1.5$). Finally, a range of medical specialties, 26 in total, were represented, the most common being family medicine ($n = 34$), internal medicine ($n = 14$), and obstetrics and gynecology ($n = 10$). Ethics

approval for the use of human subjects was obtained through the ethics review board at the University of Ottawa – the where the research was conducted.

Data Collection Procedures

Provincial associations were contacted via the Canadian Medical Association to request that an e-mail invitation be sent ⁶ to their members on behalf of the researchers. Seven of ten provinces responded to the call and agreed to do this. The invitation contained general information about the study, ethical procedures, and a web-link to access the questionnaires via a secure website. Further to distributing the recruitment e-mail, many provincial medical associations opted to also advertise the study on their website and in their newsletters. Participation was voluntary and involved responding to online questionnaires that assessed psychological and affective well-being, self-regulation capacity, as well as demographic variables. Before responding to the questionnaires, which took approximately 20 minutes, participants were prompted to review the detailed consent form and check a box to provide their informed consent. Although individual data were kept strictly confidential, responses were tracked using a study identification number assigned to each participant for potential participation in the subsequent qualitative phase of the study. The following section provides a brief description of the online questionnaires.

Demographic questionnaire⁷. This questionnaire was used to describe the demographic characteristics of the sample, including sex, medical specialty, years of practice, province of practice, practice setting (urban or rural), and status (physician or resident physician).

Psychological well-being. Ryff and Keyes' (1995) Scales of Psychological Well-Being (SPWB)⁸ was used to measure psychological well-being. The SPWB comprises six 14-item

⁶ Refer to Appendix G for documents related to permissions, recruitment, and consent for Phase 1.

⁷ See Appendix H.

scales that evaluate psychological well-being across the following dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. The 84 items are evaluated using a 6-point Likert scale ranging from strongly disagree to strongly agree, and generate six scale scores. Example items include: “My decisions are not usually influenced by what everyone else is doing” (autonomy), and “I enjoy making plans for the future and working to make them a reality” (purpose in life). The SPWB has sound psychometric properties and has been used as a comprehensive and reliable measure of well-being in several contexts, including health (e.g., Dukes-Holland and Holahan 2003) and vocational contexts (e.g., Strauser et al. 2008). All six scales have demonstrated excellent internal consistency, with Chronbach’s alpha values of .93 (self-acceptance), .91 (positive relations with others), .90 (environmental mastery), .90 (purpose in life), .87 (personal growth), and .86 (autonomy) (Ryff 1989).

Affective well-being. The Positive and Negative Affect Schedule (PANAS, Watson et al. 1988)⁹ was used to measure affective well-being. With 20 items divided into two 10-item subscales, it assesses how frequently respondents have been experiencing a variety of feelings reflecting positive and negative affect. For example, using a 5-point Likert scale (1 = never, 5 = always), respondents indicate, “To what extent [they] have felt upset during the past few days”. Ratings for each subscale are summed, resulting in a total score out of 50 for each subscale. The PANAS has been established as a valid and reliable measure of affective well-being (Miller et al. 2005; Parker et al. 2008) in both health (Voogt et al. 2005) and vocational (e.g., Lent and Brown 2008) contexts. It has also demonstrated excellent internal consistency, with Chronbach’s alpha values of .87 for both the positive and negative affect subscales (Watson et al. 1988).

⁸ See Appendix I.

⁹ See Appendix J.

Self-Regulation capacity. In order to assess the participants' general self-regulation capacity (Brown 1998; Miller and Brown 1991), the short version of the Self-Regulation Questionnaire (SSRQ, Carey et al. 2004)¹⁰ was used. Emerging from the original Self-Regulation Questionnaire (SRQ, Brown et al. 1999), the SSRQ is a single factor, 31-item questionnaire scored on a 1 to 5 Likert scale ranging from strongly disagree to strongly agree, yielding a total self-regulation capacity score. An example item is, "I set goals for myself, and keep track of my progress". The SSRQ has been used to measure self-regulation capacity in relation to different health-related variables, from alcohol abuse (e.g., Haustad et al. 2009) to dispositional happiness (e.g., Okun et al. 2009). However nearly all studies to date have been based on undergraduate student populations. The SSRQ has demonstrated excellent internal consistency, with a Chronbach's alpha value of .92 (Carey et al. 2004).

Data Analyses

The data from the online questionnaires were imported into SPSS Statistics Version 20 to verify the internal consistency coefficients of the scales and to compute descriptive statistics and multivariate analyses of variances (MANOVAs). Specifically, internal consistency coefficients were generated for each scale/subscale and an exploratory factor analysis was performed on the SSRQ since it was seldom used in health and vocational contexts. Two between-subject MANOVAs were conducted for the dependent variables of psychological and affective well-being, respectively, to determine whether or not psychological and affective well-being differed as a function of self-regulation capacity (i.e., high and low) and status (i.e., physician and resident physician).

Before conducting the MANOVAs, the SSRQ data was transformed into a categorical variable (i.e., high and low self-regulation capacity). Using a quintile split, the data was re-coded

¹⁰ See Appendix K.

into two levels; high self-regulation capacity ($n = 56$; fourth and fifth quartiles), and low self-regulation capacity ($n = 51$; first and second quartiles), accounting for 42.4% and 38.6% of the data, respectively. Scores from the third quartile ($n = 25$) were discarded in order to adequately distinguish between high and low self-regulation capacity.

Based on Tabachnick and Fidell's (1996) recommendations to determine sample size, an adequate number of participants were included in this study to conduct the MANOVAs as there were more cases in every cell than the number of dependent variables. Nevertheless, Pillai's Trace was used to report the multivariate tests in lieu of the more common Wilks' Lambda as it is more robust and preferred when cell sizes are unequal (Garson 2012).

Results

Internal Consistency and Exploratory Factor Analysis

The SPWB scales had acceptable internal consistency coefficients, with Cronbach's alpha values ranging from .91 (excellent) to .82 (good) (George and Mallery 2003). Both PANAS subscales were also internally consistent with alpha values of .92 (excellent) for positive affect, and .80 (good) for negative affect (see Table 1). Given the implicit conceptual similarities between psychological and affective well-being, it is noteworthy that issues related to collinearity between the SPWB and PANAS were deemed unlikely due to the Pearson correlation coefficients of .67 and -.47 for positive and negative affect, respectively, with psychological well-being (based on an average total score derived from all six scale scores).

Although the SSRQ was the most conceptually relevant and psychometrically valid self-report measure available to assess general self-regulation capacity (Carey et al. 2004), it had seldom been used in a medical context prior to the current study. Therefore, an exploratory factor analysis (EFA) using a forced one-factor solution (principal component analysis extraction

method) was conducted to verify if Carey et al.'s (2004) 31-item single factor could be reproduced with this population. Using the same criterion as that in the original SSRQ psychometrics evaluation (Carey et al. 2004), items loading below .4 were removed over a six-step recursive process, at the end of which all items loaded above this value and additional item removal failed to increase the variance.

Of the original SSRQ items, 12 were dropped leaving 19 items with a total variance of 31.8% explained. Although the total variance explained was nearly 11% lower than the 43% reported by Carey and colleagues (2004), it was decided that removing additional items would compromise the conceptual integrity of the original SSRQ (Carey et al. 2004). The Kaiser-Meyer-Olkin measure of sampling adequacy was .826, above the recommended $> .500$ (Kaiser 1970), and Bartlett's test of sphericity was significant ($\chi^2 = 885.68, p < .001$), indicating favorable factorability. Cronbach's alpha (.874) demonstrated favorable internal consistency, but was slightly lower to the .92 value found by Carey et al. (2004) with the original 31-item SSRQ. The scores from the revised 19-item SSRQ ($n = 132$) fell within an acceptable normal distribution range (Skewness, -.099; Kurtosis, -.300). In light of the lack of conceptually relevant tools measuring general self-regulation capacity, and the acceptable psychometric properties of the revised 19-item version of the SSRQ, the latter was used to assess the level of self-regulation capacity of physicians and resident physicians.

Descriptive Statistics

All data were normally distributed. Means, standard deviations, and Cronbach's alpha values (α) from the SPWB ($n = 120$) (Ryff and Keyes 1995), the 19-item SSRQ ($n = 132$) (revised from Carey et al. 2004), and the PANAS ($n = 117$) (Watson et al., 1988) are provided in Table 1.

(Insert Table 1)

It is likely that differences in the sample sizes are attributable to the temporal order in which the respondents were prompted to complete the three questionnaires. Some chose to exit the website without responding to the remaining questionnaire(s). Thus, while all participants in the study responded to the SSRQ (ordered first), twelve exited after completing the SPWB (ordered second) and omitted the PANAS (ordered third), and 15 only responded to the SSRQ, omitting both the SPWB and PANAS. No participants who exited early asked to have their data withdrawn from the study.

Levels of Psychological and Affective Well-Being and Self-Regulation Capacity

With respect to psychological well-being, each individual PSWB scale was evaluated using a possible total sum score ranging from 14 to 84, whereby the higher the score, the higher the well-being for that specific dimension. Physicians ($n = 38$), on average, obtained the highest mean on purpose in life ($M = 66.92$; $SD = 9.13$) and personal growth ($M = 68.66$; $SD = 8.43$), and the lowest on environmental mastery ($M = 61.42$; $SD = 10.20$). On the other hand, resident physicians ($n = 82$) scored highest on purpose in life ($M = 69.67$; $SD = 8.8$) and personal growth ($M = 68.89$; $SD = 7.2$) like their physician colleagues, but they equally scored high on positive relations with others ($M = 69.67$; $SD = 8.80$). Like physicians, they scored the lowest on environmental mastery ($M = 58.95$; $SD = 10.48$) (see Table 1). Due to the lack of available norms or suggested ranges, psychological well-being was delimited using quartiles based on the SPWB minimum (14) and maximum (84) scores^a. Based on these parameters, both physicians and resident physicians had high levels on all dimensions of psychological well-being, with the exception of environmental mastery whereby resident physicians obtained a moderately high level that was just below the high level cut-off score.

In terms of affective well-being, the positive and negative affect subscale scores on the PANAS were each evaluated using a mean of the total possible sum scores ranging from 10 to 50. Physicians ($n = 38$) obtained a mean positive affect score of 33.84 ($SD = 9.21$) and a mean negative affect score of 16.58 ($SD = 5.47$). In comparison, resident physicians ($n = 79$) had a mean positive affect score of 33.48 ($SD = 8.19$), and a mean negative affect score of 18.59 ($SD = 5.04$). According to classification procedures adapted from Peeters et al. (1996)^b, both physicians and resident physicians had moderate levels of both positive and negative affect.

The SSRQ was evaluated using a possible total sum score varying from 19 to 95, wherein the higher the score, the higher the level of self-regulation capacity. Physicians ($n = 40$) reported a mean scale score of 69.73 ($SD = 7.85$) while resident physicians ($n = 92$) reported a mean scale score of 73.37 ($SD = 8.79$). One way to delimit high, moderate, and low self-regulation capacity was to adapt the cut-off scores reported by Brown et al. (1999)^c. Based on these, 45% ($n = 18$) of physicians and 62% ($n = 57$) of resident physicians had a high level of self-regulation capacity. In contrast, 32% ($n = 13$) of physicians and 16.3% ($n = 15$) of resident physicians had moderate levels, and finally 22.5% ($n = 9$) of physicians and 21.7% ($n = 20$) of resident physicians reported low levels of self-regulation capacity.

Multivariate Analyses

Table 1 provides group descriptive statistics for the between-subjects MANOVAs, including status (i.e., physicians and resident physicians) and self-regulation capacity (i.e., high and low).

(Insert Table 1)

Psychological well-being. The 2 (self-regulation capacity) X 2 (status) between subjects MANOVA with the six SPWB scales as dependent variables tested the hypothesis that

psychological well-being would differ as a function of self-regulation capacity. Results showed a significant main effect of self-regulation capacity $F(6, 89) = 8.009, p < .001$; Pillai's Trace = .351, partial $\eta^2 = .351$, but not of status, $F(6, 89) = .957, p = .459$; Pillai's Trace = .061, partial $\eta^2 = .061$. There was, however, an interaction effect between self-regulation capacity and status, $F(6, 89) = 2.852, p < .014$; Pillai's Trace = .161, partial $\eta^2 = .161$. Given the significant between group differences of self-regulation capacity, and the interaction effect of self-regulation capacity and status, post-hoc univariate analyses were conducted.

First, between-subjects analyses for self-regulation capacity, using a Bonferroni adjustment of $p < .0083$, revealed that there were statistically significant univariate differences between high and low self-regulation capacity for all six scales of psychological well-being: autonomy, $F(1, 94) = 8.764, p < .0083, \eta^2 = .085$; environmental mastery, $F(1, 94) = 27.959, p < .0083, \eta^2 = .229$; personal growth, $F(1, 94) = 17.917, p < .0083, \eta^2 = .160$; positive relations with others, $F(1, 94) = 13.553, p < .0083, \eta^2 = .126$; purpose in life, $F(1, 94) = 33.911, p < .0083, \eta^2 = .265$, and self-acceptance $F(1, 94) = 10.832, p < .0083, \eta^2 = .103$. All η^2 values indicated that self-regulation capacity had an effect size ranging from medium (e.g., .085; autonomy) to large (e.g., .265; purpose in life) (Cohen 1988) across the six scales of psychological well-being.

Follow-up, pairwise comparisons supported the initial hypothesis, revealing that physicians and resident physicians with high self-regulation capacity ($n = 53$) reported significantly higher levels on of psychological well-being on all six scales than those with low self-regulation capacity ($n = 45$), at $p < .0083$: Personal growth (high, $M = 71.60, SD = 6.67$; low, $M = 64.84, SD = 7.16$); purpose in life (high, $M = 73.43, SD = 6.54$; low, $M = 62.62, SD = 9.09$); positive relations with others (high, $M = 70.74, SD = 9.24$; low, $M = 61.80, SD = 10.95$);

self-acceptance (high, $M = 69.36$, $SD = 9.59$; low, $M = 59.89$, $SD = 10.95$); autonomy (high, $M = 63.02$, $SD = 9.31$; low, $M = 56.27$; $SD = 6.77$); and environmental mastery (high, $M = 64.38$, $SD = 8.87$; low, $M = 53.53$; $SD = 9.63$).

Despite a significant interaction effect of self-regulation capacity and status, post-hoc between-subjects analyses did not support this as there were no statistically significant univariate differences in autonomy, environmental mastery, personal growth, positive relations with others, and purpose in life levels. However, there was a significant difference in the interaction effect for self-regulation capacity and status on the self-acceptance dimension of psychological well-being, $F(1, 94) = 4.601$, $p = .035$, $\eta^2 = .047$. Upon visual inspection of the confidence interval plot (see Figure 1), the interaction did indeed appear to be significant.

(Insert Figure 1)

Pairwise comparisons revealed that high self-regulating resident physicians possessed significantly higher levels of self-acceptance ($M = 70.56$; $SD = 8.61$) than low-self-regulating resident physicians ($M = 58.21$; $SD = 10.1$), while by contrast, high self-regulating physicians had only slightly higher levels of self-acceptance ($M = 65.25$; $SD = 11.91$) than their low self-regulating counterparts ($M = 62.65$; $SD = 12.02$). Thus, based on the visual and pairwise comparison data, this suggests that the interaction of self-regulation capacity and status on self-acceptance appears to be more pronounced for resident physicians. It is important to note that although significant at .05 ($p = .035$), this interaction must be interpreted with caution and more studies must confirm this before drawing valid conclusions.

Affective well-being. A second, 2 (self-regulation capacity) X 2 (status) between subjects MANOVA with the two subscales of the PANAS (positive and negative affect) as dependent variables tested the hypothesis that affective well-being would differ as a function of

self-regulation capacity and status. Specifically, it was hypothesized that physicians and resident physicians reporting a higher level of self-regulation capacity would have a higher level of positive affect and a lower level of negative affect. Results showed a significant main effect of self-regulation capacity (high, $n = 45$; low, $n = 51$), $F(2, 91) = 4.802, p < .001$; Pillai's Trace = .095, $\eta^2 = .095$, but no significant main effect for status (physician, $n = 29$; resident physician, $n = 67$), $F(2, 91) = 1.059, p = .351$; Pillai's Trace = .023, $\eta^2 = .023$. The interaction effect of self-regulation capacity and status was also non significant, $F(2, 91) = 2.652, p = .076$; Pillai's Trace = .055, $\eta^2 = .055$. Although significant, the main effect of self-regulation capacity for affective well-being generated a relatively moderate effect size (.095) compared to the high effect size reported for psychological well-being (.351; based on an aggregate score of all six mean scale scores) (Cohen 1988).

Post-hoc, between-subjects analyses for self-regulation capacity, using a Bonferroni adjustment of $p < .025$, revealed that there were statistically significant univariate differences between high and low self-regulation capacity for the positive affect subscale, $F(1, 92) = 9.458, p < .025, \eta^2 = .093$, but not for the negative affect subscale, $F(1, 92) = 2.352, p = .129, \eta^2 = .025$. The relatively moderate effect size (Cohen 1988) suggests that 9.3% of the changes in positive affect can be accounted for by self-regulation capacity. Follow-up, pairwise comparisons revealed that physicians and resident physicians with a high level of self-regulation capacity reported significantly higher levels of positive affect ($M = 36.75$; $SD = 7.98$) than those with a lower level ($M = 29.69$; $SD = 8.28$), $p < .05$.

Data screening tests revealed that the assumption of homogeneity of covariance was upheld for each MANOVA, and Box's tests for equality of covariance matrices revealed no significant differences in variability between SSRQ scores and both the SPWB scale scores, F

(63, 6309) = .808, $p = .862$, and the PANAS subscale scores, $F(9, 16171) = .322$, $p = .968$.

Levene's Tests also showed homogeneity of variances ($p > .05$) for the SPWB and the PANAS.

Discussion

The purpose of this study was to (a) assess the level of psychological and affective well-being and self-regulation capacity of physicians and resident physicians; and (b) determine if there were significant differences in psychological and affective well-being between physicians and resident physicians with high and low self-regulation capacity.

Levels of Psychological and Affective Well-Being and Self-Regulation Capacity

With regards to the first objective, physicians and resident physicians reported moderate and high levels of self-regulation capacity, respectively (Brown et al. 1999). This suggests that both groups appear to be able to effectively manage themselves in their dynamic and demanding medical environment by enacting a network of processes such as goal setting and proactive planning, self-monitoring, and self-evaluation (Bandura 1991; Zimmerman 2000). These results are similar to those of Gagnon and Durand-Bush (2012) who examined the self-regulation capacity of medical students and physicians. Given that effective self-management skills have been found to positively impact productivity and work performance, mental and physical health, and the quality of social relationships (Diener and Biswas-Diener 2008; Keyes and Waterman 2003), the current findings are promising.

Furthermore, self-regulation capacity involves the development of self-awareness and self-reflection, and studies in the medical context have demonstrated that nurturing such attributes can help physicians maintain a more satisfying balance between their professional and personal life (Novack et al. 1999). Moreover, self-care activities and effective coping skills are associated with lower levels of burnout (Eckleberry-Hunt et al. 2009). This is especially relevant

for resident physicians given that the pressures of medical training are very high (Cohen and Patten 2005), and these individuals are also more likely to experience burnout compared to their trained physician counterparts (Leiter et al. 2009). Overall, with the consistently growing demands of the medical profession (Gautam 2009), it is not surprising that physicians and resident physicians possess reasonably effective self-regulation capacity and show adaptability in order to be able to fulfill their role as key health service providers. At first glance, the high levels of psychological well-being reported by the physicians and resident physicians appear to contradict conventional wisdom and research showing that they experience a high prevalence of negative psychological outcomes such as burnout (Wallace and Lemaire 2007), stress and anxiety (Cohen and Patten 2005), and depression (Gardiner et al. 2004). However, it is important to emphasize that the present study focused on indicators of positive psychological functioning and not negative outcomes. Thus one cannot ascertain if the participants were experiencing a high level of well-being even in the presence of high anxiety and burnout symptoms (e.g., Keyes, 2002).

Like self-regulation capacity, there are few studies in the medical context that offer comparative data for psychological well-being. However, Gagnon and Durand-Bush (2012) found similar results in that both physicians and medical students in their study reported moderate to moderately high levels of psychological well-being, with personal growth, positive relationships, and purpose in life generating the highest scores. Interestingly, the physicians and resident physicians in the current study also scored the highest on personal growth and purpose in life (relative to the other scales). According to Ryff and Keyes (1995), personal growth involves continued development, especially as it relates to increasing self-knowledge and effectiveness. Ongoing professional development such as learning how to determine personal

needs and desired outcomes is an important part of medicine (Mann and Gelula 2003; Violato and Lockyer 2006). Furthermore, many medical licensing boards make it compulsory for their members to participate in continuing education programs in order to maintain their professional certification (Duffy and Holmboe 2006). As such, it is not particularly surprising that personal growth was rated as high among participants in the current study and that of Gagnon and Durand-Bush (2012). Participants also reported a strong sense of purpose in life, which is a key aspect of optimal functioning. This suggests that the physicians and resident physicians had goals and a sense of directedness, and they felt that there was meaning to their present and past life (Ryff and Keyes 1995). According to Devi (2011), individuals should choose a medical career based on personal values and aims, and it appears that those in the current study valued their work. Interestingly, value congruence has been shown to be a strong predictor of professional efficacy and lower levels of distress (Leiter et al. 2009). As such, there seems to be merit in nurturing a strong sense of purpose and values in physicians.

Although the physicians and resident physicians in this study reported high levels of autonomy and moderate to high levels of environmental mastery, these were lower relative to the other dimensions. Since environmental mastery is associated with a sense of competence in managing the activities within one's environment (Ryff and Keyes 1995), it is somewhat interesting that despite the years of intensive medical training that physicians undergo, they rated this dimension of psychological well-being as one of the lowest. A potential explanation could be that physicians today face consistently growing demands and pressures and perceive to have less control over their environment, the effect of which is compounded by decreasing personal and occupational resources (Gautam 2009).

The physicians and resident physicians reported moderate levels of both positive and

negative affect. These findings are consistent with data from the general population (e.g., Foster et al. 2008) but inconsistent with some previous research suggesting there is a high prevalence of emotional distress among physicians (Ro et al. 2007). However, since the present study is the first known one to assess the affective well-being of physicians using the PANAS, more research is warranted to confirm this finding. It is important to develop a comprehensive understanding of the positive and negative affect levels of physicians as there are potentially serious consequences if physicians experience distress and emotionally disconnect themselves from their work (Meldrum 2010), one of which is burnout (Tyssen 2007).

Differences in Psychological and Affective Well-Being as a Function of Self-Regulation Capacity

Results of this study confirmed the hypothesis that high self-regulating physicians and resident physicians would have higher levels of psychological well-being and positive affect compared to those with lower levels of self-regulation capacity. These results are consistent with the literature on the concept of self-regulation and Gagnon and Durand-Bush's (2012) findings. Effective self-regulation leads to a range of positive well-being outcomes (Baumeister et al. 2006; Sanders and Mazzucchelli 2012), and interestingly, individuals with higher levels of well-being tend to adopt more positive self-care behaviours, and exhibit fewer maladaptive behaviours (Diener and Ryan 2009; Zimmerman 2000). Of interest, self-regulation capacity does not necessarily develop with maturation. It can and should be nurtured by external social agents (Zimmerman 2000). Simon and Durand-Bush (2009) found that nurturing self-regulation capacity in medical students through a 17-week intervention was perceived to enhance performance and well-being. As such, it would be worthwhile to further investigate if and how

the development of self-regulation skills can increase physician and resident physicians' well-being.

The finding that physicians and resident physicians with high levels of self-regulation capacity also reported higher levels of positive affect than their lower self-regulating colleagues emphasizes the role of emotions in the self-regulation process (Gross and Thompson 2007). For instance, emotions are thought to contribute to both successes and failures of self-regulation (Vohs and Baumeister 2004), and are essential for our continuing mental and physical health (Ochsner and Gross 2004). In the context of medicine, emotions are linked to physician well-being, especially with respect to negative outcomes such as anxiety (Ro et al. 2007). However, results of this study did not support the hypothesis that higher self-regulating individuals would have lower negative affect. Perhaps this is an indication that even though the physicians and resident physicians could self-manage, they still experienced some negative affect due to the demands and stressors they encountered in the profession. More research is required to confirm this finding.

Differences in Psychological and Affective Well-Being as a Function of Status

Although findings did not support the hypothesis that physicians would have significantly higher levels of psychological and affective well-being than resident physicians, there was tentative support for an interaction between self-regulation capacity and status for the self-acceptance dimension of psychological well-being. In other words, high self-regulating resident physicians possessed significantly higher levels of self-acceptance than their low-self-regulating counterparts, while high self-regulating physicians had only slightly higher levels of self-acceptance than their low self-regulating colleagues. The absence of overall differences between the two groups is not inconsistent with existing findings. For example, dysfunctional outcomes

such as burnout (Bragard et al. 2010), stress (Daly and Willcock 2002), and anxiety (Michels et al. 2003) have not only been reported in physicians but also resident physicians. However, it is unclear as to why self-regulation capacity would have a higher impact on the self-acceptance of resident physicians. Self-acceptance is characterized by positive evaluations and a positive attitude toward oneself and past life experiences (Ryff and Keyes 1995). One possible explanation is that residents who can effectively manage their thoughts, feelings, and behaviors in their personal and professional life may be more inclined to accept the different roles they play and be more satisfied with themselves and their past experiences, even though they have less practice than physicians who have been in the field for a while. Conversely, more skilled physicians may need to rely less on their capacity to self-regulate in order to maintain positive self-evaluations and an overall sense of satisfaction with their life.

Limitations

Although the results of this study offer unique insight into the role that self-regulation capacity may play in the well-being of physicians, there are several notable limitations. First, given the nature of self-reported data and the potential effect of social desirability, results must be interpreted with caution (McBurney 1994). Furthermore, even though most geographical regions of Canada were represented, participation rates were disproportionate and results should not be generalized to all physicians.

There are also limitations with respect to the measures used. First, the PANAS measured how participants felt over “the last few days” (Watson et al. 1988), whereas questions from the SSRQ (Carey et al. 2004) and the SPWB (Ryff and Keyes 1995) pertained to general perceptions of self-regulation capacity and psychological well-being over a longer period of time (e.g., weeks or months). Therefore, the fact that responses were based on different temporal periods makes it

more difficult to compare results. Second, the SSRQ and SPWB could be considered as "trait" rather than "state" self-report measures. However, one could argue that self-regulation capacity and psychological well-being may be context specific, and the SSRQ and SPWB do not assess potential variations across contexts. An important step to advance research would be to explore the dynamic and contextual aspects of both self-regulation capacity and well-being and ensure that measures account for any potential variation. With respect to the SSRQ, although an EFA supported the 19-item version that was used for the analyses, further psychometric tests with this shorter version are advised. While the SSRQ was the most reliable and conceptually relevant measure available, the complex and dynamic nature of self-regulation capacity may warrant the development of a more comprehensive tool. Finally, the significant interaction between self-regulation capacity and status for the dimension of self-acceptance must be interpreted with caution as an unadjusted significance level ($p < .05$) was used to determine significance and the effect size was small (Cohen 1988).

Conclusions

In light of calls for research emphasizing the positive elements of physician well-being (Spickard 2001), the present study addressed an important gap in the literature. Building on the findings of Gagnon and Durand-Bush (2012), Sandars and Cleary (2011), and Simon and Durand-Bush (2009), findings suggest that a deeper understanding of physicians' capacity to self-regulate could help uncover ways to help them achieve positive and healthy living (Shanafelt et al. 2003). Physicians and resident physicians in this study had moderate to high levels of psychological and affective well-being. They also reported moderate to high levels of self-regulation capacity. Of interest, high self-regulating physicians and resident physicians

possessed higher levels of psychological well-being and positive affect compared to their low self-regulating colleagues, however, there were no differences with regards to negative affect.

As a fundamental capacity and important element of positive human functioning, self-regulation capacity has a profound impact on everyday living (Vohs and Baumeister 2004). Given the positive link between the participants' capacity to self-regulate and their levels of well-being, and the lack of significant differences between the levels of physicians and resident physicians, the present study suggests that developing or strengthening self-regulation competence could be a potential avenue to help both physicians and resident physicians become adaptive and resilient to the evolving demands of the medical profession (Remen 2001).

List of Abbreviations

SPWB: Scales of Psychological Well-Being; PANAS: Positive and Negative Affect Schedule; SSRQ: Short-Form Self-Regulation Questionnaire; SRQ: Self-Regulation Questionnaire; SPSS: Statistical Product and Service Solutions; MANOVA: Multivariate Analysis of Variance.

Endnotes

^a High psychological well-being scores are those greater than 59.5; moderate-high scores are between 35 and 59.5; moderate-low scores are between 24.5 and 35; and low scores are lower than 24.5;

^b Mean scores greater than or equal to 35 represent above average to very high positive affect, while mean scores between 32 and 34 represent average, and less than or equal to 31 reflect below average to very low positive affect. With respect to negative affect, mean scores greater than or equal to 31 represent above average to very high negative affect, while mean scores between 20 and 30 represent average, and less than or equal to 15 reflect below average to very low negative affect;

^c Mean scores greater than or equal to 71.5 represent high self-regulation capacity; mean scores between 71 and 65 reflect moderate capacity; and less than or equal to 64.5 scores show low self-regulation capacity.

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Table 1

Descriptive statistics and Cronbach's alpha values for self-regulation capacity, psychological well-being, and affective well-being

Variable	Overall <i>M</i> (<i>SD</i>)	α	Physician <i>M</i> (<i>SD</i>)	Resident <i>M</i> (<i>SD</i>)
Psychological Well-Being ^a				
Personal growth	68.82 (7.57)	.85	68.66 (8.43)	68.89 (7.2)
Purpose in life	68.80 (8.96)	.89	66.92 (9.13)	69.67 (8.8)
Positive relations with others	66.64 (10.65)	.91	65.37 (11.53)	67.23 (10.23)
Self-acceptance	65.55 (10.73)	.91	65.42 (10.92)	65.61 (10.7)
Autonomy	60.22 (8.76)	.82	61.13 (7.85)	59.80 (9.17)
Environmental mastery	59.73 (10.42)	.89	61.42 (10.2)	58.95 (10.48)
Affective well-being ^b				
Positive affect	33.60 (8.49)	.92	33.84 (9.21)	33.48 (8.19)
Negative affect	17.94 (5.25)	.80	16.58 (5.47)	18.59 (5.04)
Self-Regulation Capacity ^c	72.28 (8.65)	.87	69.73 (7.85)	73.39 (8.79)

Note. *M* = Mean; *SD* = Standard deviation; α = Cronbach's alpha value.

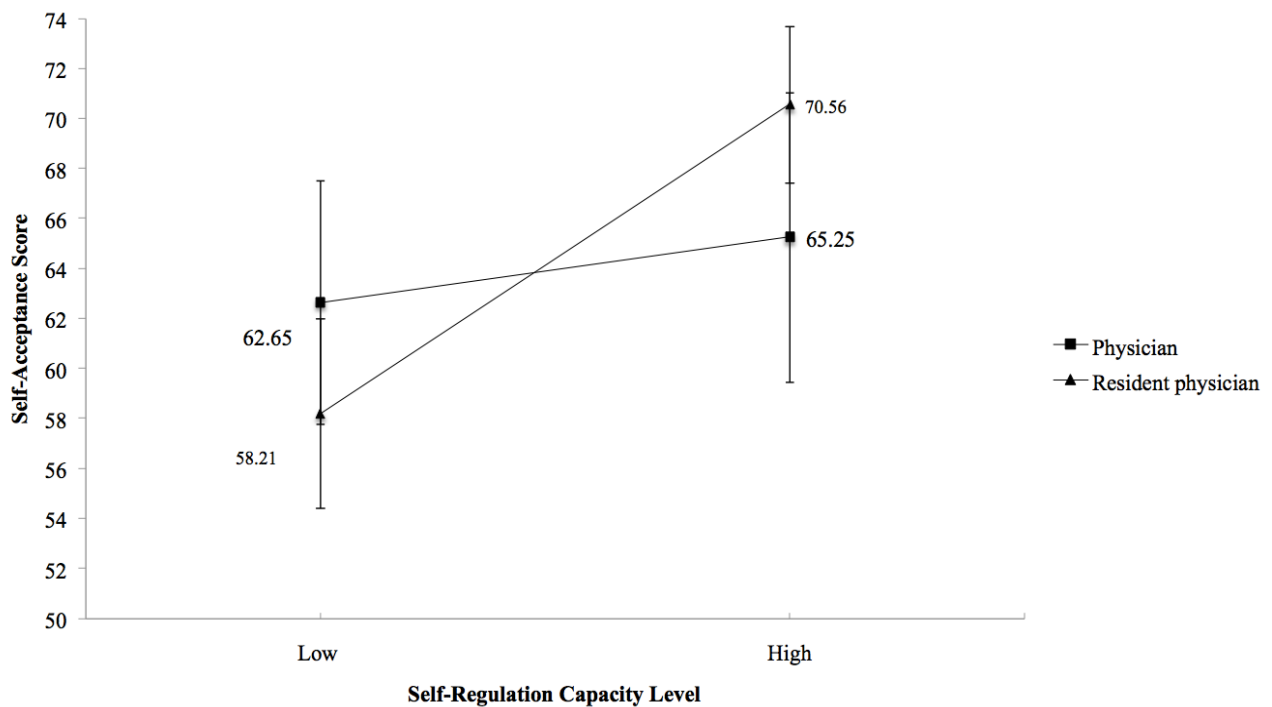
^a*n* = 120.

^b*n* = 117.

^c*n* = 132.

Figure 1

Interaction between self-regulation capacity level and status for self-acceptance dimension of psychological well-being.



Note. Whisker bars represent the upper and lower bound confidence intervals (95%) for mean values of low and high self-regulation groups.

Feature Article 2

Does Self-Regulation Capacity Predict Psychological Well-Being In Physicians?

Title of Journal: Psychology, Health, and Medicine

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Does self-regulation capacity predict psychological well-being in physicians?

Despite increasing research on physician well-being, factors appearing to account for individual variation in levels of optimal functioning are largely unclear. One such factor could be self-regulation, which reflects how individuals effectively manage their thoughts, emotions and behaviours, and cope with adversity in their environment. The purpose of this study was to determine if self-regulation capacity could significantly predict psychological well-being in a sample of physicians. A total of 132 physicians completed the Scales of Psychological Well-Being and the short form of the Self-Regulation Questionnaire. Regression analyses confirmed the hypothesis that a significant amount of variance in levels of psychological well-being would be explained by self-regulation capacity. There was a particularly strong relationship between self-regulation capacity and the dimensions of purpose in life and environmental mastery, which suggests that physicians who effectively self-manage may be better able to preserve a sense of purpose and an adequate work-life balance in their daily life. Physicians today face consistently growing demands stemming from increasingly challenging work environments. Results of this study mark an important step in increasing our understanding of a potentially valuable skill that may help physicians to achieve well-being.

Keywords: Self-Regulation; Psychological Well-Being; Physician; Positive Psychology; Wellness

Introduction

The current study is part of a larger research endeavour examining the well-being and self-regulation capacity of physicians. It represents one of the first investigations to examine the role that physicians' capacity to self-regulate may play in achieving adequate levels of psychological well-being. Self-regulation capacity refers to one's aptitude to plan, implement desired thoughts, feelings, and actions, and adapt them to one's changing and demanding environment in order to achieve set goals (Brown, Miller, & Lewendowski, 1999; Zimmerman, 2000). It has been linked to increased well-being in domains such as psychology (Carver & Scheier, 1998), health (Leventhal, Brissette, & Leventhal, 2003), and education (Boekaerts & Niemivirta, 2000), however, its impact on physician well-being remains largely unknown.

Literature Review

Physician health and well-being

Research on physician health and well-being has been gaining momentum in recent years given the prevalence of lower levels of well-being amongst these health professionals (Canadian Physician Health Institute, 2014; Shanafelt, Sloan, & Habermann, 2003). Negative outcomes have been associated with reduced physician well-being including burnout (Vltmer, Kieschke, Schwappach, Wirsching, & Spahn, 2008), stress and anxiety (Lee, Stewart, & Brown, 2008), and depression (Gardiner, Lovell, & Williamson, 2004). Such outcomes have also been linked to decreased life satisfaction (Shanafelt et al., 2003), impaired personal and professional relationships (Weiner, Swain, & Gottlieb, 1998) and – perhaps most disturbingly for the public – compromised patient care (Taub, Morin, Goldrich, & Benjamin, 2006).

Psychological well-being

Although the body of research on physician health and well-being has largely focused on dysfunctional outcomes (Weiner, Swain, Wolf, & Gottlieb, 2001), there has been a trend towards conceptualizing well-being through a positive psychology lens (Taub et al., 2006). The positive psychology movement is based on the premise that "a psychology of positive human functioning will arise, which achieves a scientific understanding and effective interventions to build thriving individuals, families, and communities" (Seligman & Csikszentmihalyi, 2000). Arguably, this could help provide a more comprehensive perspective of physician wellness leading to actions for positive change. As proponents of positive psychology, Ryff and Keyes (1995) postulated a multidimensional framework of psychological well-being that involves six distinct but interrelated dimensions of positive psychological functioning. The extent to which individuals experience these dimensions reflects their overall sense of psychological well-being:

- (1) A sense of continued growth and development as a person (personal growth);
 - (2) Positive evaluations of oneself and one's past life (self-acceptance);
 - (3) A sense of self-determination (autonomy);
 - (4) The belief that one's life is purposeful and meaningful (purpose in life);
 - (5) The possession of quality relations with others (positive relations with others);
- and
- (6) The capacity to manage effectively one's life and surrounding world
(environmental mastery).

Although researchers have seldom used Ryff and Keyes' framework in studies on physician health and wellness, they have individually examined dimensions in one way, shape or form. For instance, Falkum and Vaglum (2005) found that interpersonal problems were linked to occupational stress, which underscores the importance positive relations with others. Tyssen (2007), who addressed autonomy among other variables, reported an association between low autonomy, high demands and various mental health issues. Swaen, Kant, van Amelsvoort, and Beurskens, (2002) gave insight into the significance of purpose in life, showing that physicians whose work conditions align with their preferred standards and values experience less burnout than colleagues who do not have this congruence.

Notwithstanding these studies, an important question that remains unanswered is: Why are some physicians able to mitigate the negative effects of the adversity they face and experience high levels of well-being, while others encounter difficulties and report low levels of well-being under similar circumstances? One such variable that could account for individual variation may be self-regulation.

Self-regulation capacity and well-being

Self-regulation refers to an individual's capacity to develop, implement and flexibly maintain planned behaviour in order to achieve one's goals (Brown et al., 1999). Since it involves processes that are within one's control (e.g., planning and evaluating), it can be developed through deliberate practice and systematic interventions (Zimmerman, 2000). Self-regulation has been linked to a range of positive and negative well-being outcomes (Sanders & Mazzucchelli, 2012). For instance, university students with pronounced self-regulatory skills reported higher levels of well-being (Hofer, Busch, & Kärtner, 2011) and lower levels of depression and stress (Park, Edmondson, & Lee, 2012). Increased self-control among students also predicted better interpersonal relationships (Tangney, Baumeister, & Boone 2004). Conversely, Hustad, Carey, Carey, and Maisto (2009) found that a diminished capacity to self-regulate was associated with an increased risk of alcohol-dependence. These findings are particularly relevant to the medical profession as we know that impaired social relationships, depression, stress and substance abuse are related to reduced well-being in physicians (Firth-Cozens, 2001; Gardiner et al., 2004).

Researchers have seldom examined self-regulation in the context of medicine. However, two studies have laid the groundwork for the current study. First, Gagnon and Durand-Bush (2012) found that the self-regulation capacity of medical students and physicians significantly predicted their psychological well-being, stress and burnout levels. The sample was limited thus more research is warranted to confirm these results. Secondly, Simon and Durand-Bush (2009) examined the development of self-regulation skills and its impact on perceived performance and well-being in medical students over the course of a 17-week intervention. Results showed that the students were able to learn how to effectively regulate their thoughts, emotions and

behaviours in order to optimize performance and well-being in the medical context. These two studies suggest that self-regulation capacity may be a relevant skill to develop in order to meet the high demands of the medical profession.

Purpose and rationale

Given the gaps in the literature and the importance of finding controllable means to increase well-being amongst physicians, the purpose of the present study was to examine whether or not physicians' capacity to self-regulate could explain a significant proportion of variance in their levels of psychological well-being. Based on Gagnon and Durand-Bush's (2012) study, we hypothesized that self-regulation capacity would (a) have a significant positive relationship with all dimensions of psychological well-being and (b) significantly predict physicians' levels of psychological well-being.

Methods

Participants

The sample included 132 physicians who were practicing medicine or undergoing their residency training. In particular, there were 40 physicians and 92 residents, and of these, 86 were women and 46 were men. Participants had on average 11.17 years ($SD = 5.89$) of experience and represented 26 different medical specialties, the most common being family medicine, paediatrics, and internal medicine.

Procedures¹¹

Provincial and territorial medical associations were contacted to participate, and 7 of the 10 forwarded an e-mail invitation to prospective physicians on behalf of the researchers. The invitation contained general information about the study, ethical procedures and a secure web-link for physicians to provide their consent and access online questionnaires assessing

¹¹ Refer to Appendix G for documents related to permissions, recruitment, and consent for Phase 1.

demographic variables, self-regulation capacity and psychological well-being. Their participation was voluntary and involved approximately 20 minutes of their time. Ethics approval for this study was obtained from the ethics review board at the institution where the research was conducted.

Measures

Demographic questionnaire¹²

The demographic questionnaire served to gather data for the broader research project; however, status (physician or resident physician) was the demographic variable of interest in the current study.

Self-regulation capacity

The short version of the Self-Regulation Questionnaire (SSRQ, Carey, Neal, & Collins, 2004)¹³ was the most relevant measure available to assess physicians' general self-regulation capacity (Miller & Brown, 1991). Emerging from the original Self-Regulation Questionnaire (SRQ, Brown et al., 1999), the SSRQ is a single factor, 31-item questionnaire, which is scored using a 1 to 5 Likert-scale ranging from strongly, disagree to strongly agree, and yielding a single general self-regulation score. It reveals cognitive, affective, behavioural and social/environmental aspects of self-regulation, as well as both proactive (e.g., planning and adjusting of goals) and reactive (e.g., responding to adversity) sub-processes. The SSRQ has demonstrated acceptable psychometric properties and has been primarily used with university student populations in relation to alcohol abuse (Carey, Henson, Carey, & Maisto, 2007).

¹² See Appendix H.

¹³ See Appendix K.

Psychological well-being

Physicians' psychological well-being was assessed using Ryff and Keyes' (1995) "Scales of Psychological Well-Being" (SPWB)¹⁴, derived from their multidimensional framework. The SPWB comprises six scales (i.e., personal growth, self-acceptance, autonomy, purpose in life, positive relations with others, and environmental mastery) with 14 items each that are answered using a six-point Likert scale ranging from strongly disagree to strongly agree. The SPWB was shown to be a comprehensive, valid, and reliable measure in several contexts including health (Hart, Fonareva, Merluzzi, & Mohr, 2005), and the workplace (Strauser, Lustig, & Ciftci, 2008).

Data analyses

The psychometric properties of the scales were first verified by calculating internal consistency coefficients for each scale. Given the limited scope of the use of the SSRQ, an exploratory factor analysis was performed to verify its 31-item structure. Next, a series of simple linear regressions (Triola, Goodman, & Law, 2002) were conducted to determine if physicians' self-regulation capacity could significantly predict their psychological well-being.

Finally, MANOVA analyses conducted as part the larger study revealed a significant interaction between status (physician or resident physician) and self-regulation capacity for the self-acceptance scale, $F(1, 94) = 4.6, p < .05, \eta^2 = .047$. Interactions were not found for the other five SPWB scales. Results and discussion of these MANOVA analyses and interaction were included in another article. However, given the significant interaction for self-acceptance, this variable was excluded from the simple linear regressions performed in the current study and a separate hierarchical regression was conducted in order to ensure that self-regulation capacity and status exerted independent influence on self-acceptance scores.

¹⁴ See Appendix J.

Results

Internal consistency and EFA

Internally consistent coefficients of the scales ranged from ‘good’ to ‘excellent’ (George & Mallery, 2003, see Cronbach’s alpha values in Table 1). To verify the 31-item structure of the SSRQ with the current sample ($n = 132$), an exploratory factor analysis (EFA) was conducted using a forced one-factor solution with a principal component analysis extraction method. Of the original 31 items, 12 were dropped, leaving 19 items with 31.8% of the total variance explained. Kaiser-Meyer-Olkin’s measure of sampling adequacy of .826 was well above recommended norms (Cerny & Kaiser, 1977), and Bartlett’s test of sphericity indicated favorable factorability ($\chi^2 = 885.68, p < .001$). Finally, Cronbach’s alpha (.874) demonstrated ‘good’ internal consistency (George & Mallery, 2003) and was comparable to the .92 value reported with the original 31-item SSRQ (Carey et al., 2004). Overall, the absence of other conceptually relevant measures of general self-regulation capacity warranted the use of this single factor, 19-item version of the SSRQ in the present study.

Descriptive statistics

All data were normally distributed, and means and standard deviations from the revised SSRQ and SPWB are provided in Table 1.

(Insert Table 1)

Regression analyses

Results of the linear regressions are presented in Table 2.

(Insert Table 2)

As hypothesized, there was a significant positive relationship between self-regulation capacity and the six dimensions of psychological well-being. Furthermore, physicians’ self-

regulation capacity significantly predicted all dimensions of psychological well-being. Self-regulation capacity accounted for 44% of the variance in purpose in life, 39% in environmental mastery, 29% in personal growth, 25% in positive relations with others and 16% in autonomy. Based on Cohen's criterion (1988), self-regulation had a strong positive relationship with all dimensions of psychological well-being (.50 to .66), with the exception of autonomy with which it had a moderately strong relationship (.46).

In light of the significant interaction between self-regulation capacity and status for the self-acceptance scale, a hierarchical regression model was computed and results are presented in Table 3.

(Insert Table 3)

In the first step of the model, there was a strong, positive relationship between self-regulation capacity and self-acceptance, $\beta = .52, p < .001$. On the other hand, the relationship between status and self-acceptance was not significant, $\beta = -.08, p = .32$. These two variables significantly explained 25% of the variance in self-acceptance, $F(2, 117) = 20.7, p < .001$. The interaction term between self-regulation capacity and status that was added in the second step of the model was non-significant, $\beta = .23, p = .156$. Thus, the addition of the interaction did not explain additional variance in self-acceptance above and beyond the independent influences of self-regulation and status, $\Delta F(1, 116) = 2.04, p = .156, \Delta R^2 = .013$.

Discussion

Despite increased research on physician health and well-being, our understanding of variables that could explain variations in well-being across physicians is limited (Wallace & Lemaire, 2007). Self-regulation capacity, linked to a range of well-being outcomes (Sanders & Mazzucchelli, 2012), was put forward as one such variable. As expected, physicians' self-

regulation capacity significantly predicted their levels of psychological well-being. This supports Gagnon and Durand-Bush's (2012) findings, and research in other contexts demonstrating positive associations between these variables (Hofer et al., 2011; Sanders & Mazzucchelli, 2012). Given that self-regulation capacity involves controllable sub-processes such as strategic planning, self-monitoring and self-evaluation, it is empowering to know that physicians who develop this skill may be able to enhance their well-being.

Results show that there was a particularly strong relationship between self-regulation capacity and the dimensions of purpose in life and environmental mastery. This could indicate that enhancing self-regulation skills may particularly help physicians to maintain focus on what is important to them, especially in the face of obstacles (Bandura, 1986), and to preserve a sense of purpose in their work. This echoes a recent report by Devi (2011) suggesting that physicians who base their choice of medical specialty on personal needs and values tend to experience a greater sense of wellness.

As for environmental mastery, physicians have reported difficulties sustaining an adequate work-life balance (Leiter, Frank, & Matheson, 2009). As such, there may be value in helping them more effectively manage the complex array of work-related (e.g., patient load and supervision) and personal (e.g., family commitments) demands (Ryff & Keyes, 1995). In fact, the capacity to achieve such balance has been described as one of the most essential skills a physician can develop (Meldrum, 2010).

In the case of autonomy, self-regulation capacity accounted for a modest proportion of the variance and the strength of the relationship was moderate. However, since low levels of autonomy in physicians have been linked to a host of psychological issues (Arnetz, 2001) and burnout (Eckleberry-Hunt et al., 2009), it would be advantageous to further examine this

variable. Although physicians often have little control or flexibility over certain aspects of their work (e.g., scheduling, Thomas, 2004), developing skills such as proactive goal setting and strategic planning (Zimmerman, 2000) may be one way to help them adjust to certain responsibilities.

Self-regulation capacity significantly predicted physicians' level of self-acceptance, however, the interaction between self-regulation and status failed to explain additional variance above and beyond their independent influence. More research is warranted to confirm these findings. Nonetheless, the significant main effect suggests that there may be value in nurturing physicians' self-acceptance. For example, physicians who accept the roles and demands of their profession (Eckleberry-Hunt et al., 2009) respond to obstacles in more proactive and constructive ways, have realistic expectations, and experience less adverse effect from their high working demands (Meldrum, 2010). One way to achieve this may be via the enhancement of their self-regulation skills (e.g., establish desired personal standards, set realistic goals and expectations, prioritize roles and demands).

Limitations

This study is not without limitations. First, the use of self-reported instruments lends itself to social desirability (McBurney, 1994). Second, since the data only represents a limited sample of Canadian physicians, generalization to other physician populations should be cautioned. Since physicians were recruited through non-representative means and volunteered to participate, it is plausible that the sample may have been skewed by those who generally experience a high degree of well-being. Finally, although an EFA supported the 19-item version of the SSRQ, the relatively small amount of variance explained should incite researchers to further test the psychometric properties of this shorter version. Although the SSRQ was the most reliable and

conceptually relevant measure available, the complex and dynamic nature of self-regulation may warrant the development of a more comprehensive tool.

Concluding Remarks

An important contribution of this study is the investigation of physician well-being from a multidimensional perspective and positive psychology lens. Another feature pertains to physicians' capacity to self-regulate. Overall, the variance in all of the six dimensions of psychological well-being examined was significantly explained by physicians' self-regulation capacity. The more the physicians effectively managed themselves and their environment, the higher they scored on all well-being dimensions. Interestingly, self-regulation capacity accounted for substantial variance in purpose in life (44%) and environmental mastery (39%). This suggests that if physicians struggle to lead a purposeful and meaningful life and balance their work and personal activities, enhancing their self-regulation skills may be one way to address these issues.

Physicians today consistently face more demands that stem from increasingly difficult working conditions (e.g., technological advances, reduced flexibility and patient demands) and reduced personal resources (e.g., time and social support) (Eckleberry-Hunt et al., 2009). In light of these challenges, it is imperative that physicians consider developing self-management skills in order to maintain an adequate level of health and well-being (Gautam, 2009). Training could be provided through professional development workshops, seminars, or retreats, and through formal education as soon as students enter medical school.

It is not enough to recognize that barriers to well-being exist. Physicians and medical organizations/institutions must move to action because those who are able to effectively care for themselves do a better job of caring for others (Shanafelt et al., 2003). They are less likely to commit medical errors, become impaired and leave their practice – all of which are costly to any

healthcare system (Epstein & Krasner, 2013). It is our hope that this study will lead to more research and interventions focusing on positive views and strategies to enhance physician well-being.

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Table 1. Descriptive statistics and Cronbach's alpha values for self-regulation capacity and psychological well-being

Variable	Scale Scores		
	<i>M</i>	<i>SD</i>	<i>α</i>
Self-Regulation Capacity ^a	72.28	8.65	.87
Psychological Well-Being ^b			
Personal growth	68.82	7.57	.85
Purpose in life	68.80	8.96	.89
Positive relations with others	66.64	10.65	.91
Self-acceptance	65.55	10.73	.91
Autonomy	60.23	8.76	.82
Environmental mastery	59.73	10.42	.89

^aShort-Form Self-Regulation Questionnaire (19-item) ($n = 132$); ^bScales of Psychological Well-Being ($n = 120$)

Table 2. Simple linear regression analyses predicting psychological well-being from self-regulation capacity

Variable	Self-Regulation Capacity				
	<i>F</i>	β	<i>B</i>	<i>t</i>	r^2
Psychological Well-Being					
Purpose in life	91.73	.66*	.68	9.58	.44*
Environmental mastery	74.46	.62*	.74	8.63	.39*
Personal growth	48.16	.54*	.47	6.94	.29*
Positive relations with others	39.45	.50*	.61	6.28	.25*
Autonomy	23.08	.46*	.41	4.80	.16*

* $p < .001$

Table 3.

Hierarchical regression analysis predicting self-acceptance from self-regulation capacity and status

Variable	Self-Acceptance					ΔR^2
	F	B	$B(SE)$	β	$Adj. R^2$	
Constant		66.81				
Step 1 – Variables	20.7				.25*	
Self-regulation capacity		5.51	.86	.52		
Status ^a		-1.86	1.85	-.08		
Step 2 – Interaction	2.04				.26	.01
Self-regulation capacity		3.38	1.72	.32		
Status ^a		-1.40	1.87	-.06		
Interaction ^b		2.83	1.98	.23		

^aPhysician or resident; ^bInteraction of self-regulation capacity and status

* $p < .001$

Feature Article 3

A Qualitative Exploration of Physicians' Psychological Well-Being

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Abstract

Although research has expanded our understanding of physician well-being, the majority of studies have focused on dysfunctional outcomes. Knowledge of what it means for physicians “to be well” from a multidimensional perspective is generally lacking. The purpose of this study was to examine physician well-being from a multidimensional, positive psychology perspective using Ryff and Keyes' (1995) framework of psychological well-being. The latter comprises six dimensions of positive functioning, that is, self-acceptance, personal growth, purpose in life, positive relations with others, environmental mastery, and autonomy. Selected based on the results of an initial quantitative phase, 12 physicians took part in a single, in-depth, individual interview to discuss their experiences of psychological well-being. The transcribed, qualitative data was subjected to a systematic content analysis. Physicians shared high and low functioning experiences of psychological well-being across the dimensions of self-acceptance, positive relations with others, environmental mastery, and autonomy. They reported high functioning for the dimensions of personal growth and purpose in life. Their experiences also varied based on their professional and personal life contexts, with work-life balance emerging as a prevalent theme. Overall, this study addressed important gaps in the literature and includes a tentative model of physicians' psychological well-being to guide future research and practice.

Keywords: Physician; Psychological Well-Being; Wellness; Positive Psychology; Work-Life Balance.

A Qualitative Exploration of Physicians' Psychological Well-Being

Introduction

Medicine is a stressful occupation. The rapidly evolving demands of modern medical practice (Meldrum, 2010) have contributed to this profession's long list of health risks and challenges (Arnetz, 2001). With up to 25% of physicians facing mental health issues that interfere with their practice, a prevailing stigma regarding ill-being unfortunately persists within the profession, and remains a barrier (Gautam, 2009). Maintaining wellness is a challenge in many occupations, however, it is even more crucial in those in which impairment or errors can have significant consequences on public safety. While considerable work has been done to promote and regulate well-being in certain professions (e.g., pilots, professional drivers), such preventative practices are much less common in medicine (Tyssen, 2007).

In order to have a positive impact on this health occupation, we must shift our thinking and doing to help physicians critically examine, prioritize, and manage their own wellness (Violato & Lockyer, 2006). The literature shows that the majority of the research on physician well-being has focused on dysfunctional outcomes (Spickard, 2001). Hence, we know little about what leads physicians to optimally function and to be well within the constraints and the considerable demands they face on a daily basis. To address this gap in the literature and the profession, the purpose of the present study was to explore physician well-being from a positive functioning perspective.

Well-Being from a Dysfunctional Perspective

While physicians have been found to be in good physical health compared to the general population (Frank, 2004), the same cannot be said about their mental and emotional health. A high prevalence of dysfunctional outcomes resulting from their reduced psychological and

affective well-being have been identified, including burnout (Diez-Pinol, Dolan, Sierra, & Cannings, 2008), depression (Gardiner, Lovell, & Williamson, 2004), substance abuse (Firth-Cozens, 2001), stress and anxiety (Lee, Stewart, & Brown, 2008), decreased life satisfaction (Gerrity, 2001), impaired personal and professional relationships (Weiner, Swain, & Gottlieb, 1998), and compromised patient care (Shanafelt, Sloan, & Habermann, 2003). Contemporary physicians are facing rapidly growing demands and pressures from the medical environment (Gautam, 2009). They are often overworked and exhausted, exhibit feelings of helplessness (Wallace & Lemaire, 2007), and they have difficulty balancing their professional and personal life (Bragard, Etienne, Merckaert, Libet, & Razavi, 2010).

Traditionally, well-being within physician health research has been conceptualized as the absence of illness or impairment (Diez-Pinol et al., 2008), and examined in an inconsistent and compartmentalized fashion. For example, Cohen and Patten (2005) investigated stress in one study while Eckleberry-Hunt et al. (2009) studied burnout in another, and while both referred to well-being, only inferences were made and no explicit framework was used to examine these variables. Moreover, despite the relative contributions of past studies, few provide in-depth, qualitative data on how physicians experience well-being from a multidimensional perspective. Studies reporting both high and low ranges of functioning of various dimensions of well-being are even more scarce. As such, there is still a lack of in-depth, empirically-driven knowledge of what it means for physicians to thrive from a multidimensional perspective. The inconsistency with which well-being is conceptualized in the literature further compounds this gap.

Well-Being from a Positive Functioning Perspective

According to the World Health Organization (2009), well-being is an important facet of health. Health is defined as a state of physical, mental, and social well-being, and not merely the absence of disease or infirmity. Ryan and Deci (2001) postulated that researchers can begin to fully understand well-being by examining it from different vantage points. For example, from a positive psychology perspective, well-being represents one's satisfaction with life and positive and negative affect (Diener & Ryan, 2009; Searle, 2008). It is also a function of living according to one's authentic self (Ryan & Deci, 2001) and realizing one's true potential (Compton, 2005).

Ryff and Keyes (1995) expanded the definition of well-being by postulating a multidimensional framework of psychological well-being that incorporates six distinct, but interrelated, components of positive functioning: (a) Self-acceptance: (b) Personal growth, (c) Purpose in life, (d) Positive relations with others, (e) Environmental mastery, and (f) Autonomy. Of relevance, they proposed high and low ranges of functioning for each dimension of psychological well-being, which helps to expand our understanding of the variation of experiences and states that contribute to well-being. The following are central indicators of high and low functioning for each dimension of psychological well-being:

- (a) Self-acceptance (positive evaluations of oneself and one's past life): High functioning individuals acknowledge and accept multiple aspects of their self, feel satisfied with their life to date, and have a positive attitude; low functioning individuals feel disappointed with themselves and their life to date, and are troubled about certain personal qualities (e.g., unhappy with who they are);
- (b) Personal growth (a sense of continued growth and development): High functioning individuals feel a continued sense of development and aspire to realize their potential;

low functioning individuals feel personal stagnation (e.g., reduced sense of improvement) and disinterest in their day-to-day activities;

(c) Purpose in life (belief that one's life is purposeful and meaningful): High functioning individuals have a clearly defined sense of direction; there is meaning to their life, they feel accomplished, and they hold aims and objectives for living; low functioning individuals have few objectives, lack a sense of direction, and have difficulty deriving meaning in their life;

(d) Positive relations with others (experience quality relations with others): High functioning individuals have satisfying relationships and understand the give and take in social relationships; low functioning individuals are unable to experience satisfying relationships and feel socially isolated and/or frustrated;

(e) Environmental mastery (capacity to effectively manage one's life and surrounding world): High functioning individuals can manage/balance a complex array of tasks, and choose or create contexts that match their personal needs; low functioning individuals have difficulty managing their day-to-day affairs, lack a sense of control over their environment, and feel unable to change or improve their conditions;
and

(f) Autonomy (sense of self-determination): High functioning individuals feel in control of themselves (e.g., self-determined), set personal expectations, choose their actions, and evaluate themselves based on internal perceptions; low functioning individuals do not feel in control of themselves and focus on the expectations and evaluations/judgments of others.

Overall, it is important to note that these levels of functioning vary along a spectrum, that is, individuals can experience one or more of these dimensions at different degrees and at different times. Ryff and Keyes' (1995) framework has received extensive empirical support in various domains but it has seldom been utilized to examine well-being in the context of medicine. Of the studies in which their framework was used, Weiner and colleagues (2001) found that certain approaches to life (e.g., positive outlook, focus on success, maintain balance), and specific strategies to implement these approaches (e.g. spend time with family, prioritize self-care) were significantly associated with increased psychological well-being. In another study, Gagnon and Durand-Bush (2012) examined the relationship between the psychological well-being, stress, burnout, and self-regulation capacity of physicians and medical students. They found that self-regulation capacity accounted for significant variation in each of these variables. Both studies showed how self-regulation skills were linked to different dimensions of well-being, however, they did not address how these dimensions were experienced.

Although well-being has rarely been studied as a multidimensional concept within the context of medicine, each dimension of Ryff and Keyes' (1995) model has been individually and indirectly addressed to some extent in the physician wellness literature. For instance, self-satisfaction (Solberg, Ro, Aasland, Gude, Moum, Vaglum, & Tyssen, 2012), an important indicator of self-acceptance, has been linked to physicians' ability to maintain balance between their personal and medical life. This ability has also been identified as one of the most essential skills physicians can possess (Fischman, Shutte, & Solomon, 1999; Meldrum, 2010). Becoming a self-directed and lifelong learner, another central competency in medicine (Violato & Lockyer, 2006), has been related to personal growth. With respect to purpose in life, Devi (2011) advocated that choosing a medical career on the basis of personal values leads to a greater sense

of wellness. Furthermore, Meldrum (2010) and Spickard (2001) found that guiding physicians to cultivate a sense of mastery in their career is important, which can be connected to environmental mastery. Positive relations with others is another dimension with deep roots in physician well-being, as links between interpersonal problems and occupational stress have been well-established (Falkum & Valgum, 2005; Tyssen, 2007). Furthermore, disruptive behavior, defined as inappropriate conduct among physician colleagues in the workplace (Canadian Medical Protective Association, 2013), can lead to sub-optimal performance, compromised relationships, medical errors, and ultimately reduced quality of patient care (MacDonald, Archibald, & Puddester, 2011; Leape & Fromson, 2006). Finally, the combination of high demands and low control in one's medical environment has been associated with low autonomy (Bragard et al., 2010). Autonomy has also been identified as one of the highest predictors of professional satisfaction among physicians (Freedom, 2001).

Limitations of these studies are that physician well-being was inconsistently defined, conceptualized, and measured. Furthermore, the use of a "siloed" approach has not yielded a multidimensional framework that is translatable and adaptable for both research and practice. If we want to have a more holistic, in-depth understanding of what well-being is in health occupations such as medicine, we must adopt a broader framework that will allow us to concurrently look at what personal skills, attributes, and environmental resources physicians lack and/or possess to favorably impact their well-being. We must break the tradition of focusing on impairment or reactionary approaches to reduced well-being and help the medical profession to provide opportunities for its members to take charge of their own pursuit of wellness. In sum, there is a need to view and study well-being as a multifaceted concept comprising various dimensions, and to provide insight into high and low ranges of experiences of these dimensions.

The medical profession stands to benefit and learn as much from physicians who struggle as from physicians who thrive.

Purpose

The broader aim of this research was to examine physician well-being from a multidimensional, positive psychology perspective. This paper focuses on the qualitative data collected to increase our understanding of physicians' experiences of psychological well-being by examining different dimensions of optimal functioning. Specifically, the following research questions guided this study: (a) What are physicians' experiences of psychological well-being (i.e., high and low functioning with regards to autonomy, environmental mastery, positive relations with others, personal growth, self-acceptance, and purpose in life)? (b) What enhances and inhibits physicians' well-being?

From a theoretical perspective, this research will address important gaps in the literature by further shedding light on the use of a multidimensional framework to examine the psychological well-being of physicians. Although Ryff and Keyes' (1995) framework entitled "Scales of Psychological Well-Being" has been frequently used in quantitative studies, it has never been consolidated into a workable model to conduct qualitative investigations. We have done so in this study and will present a tentative visual model summarizing dimensions and themes of physician psychological well-being that could guide future research and practice.

Methodologically, the use of qualitative methods to investigate the well-being of physicians is scarce. Furthermore, no one has used Ryff and Keyes' (1995) framework to *qualitatively* explore dimensions of psychological well-being. Consequently, this study will fill a void and provide a rich, in-depth perspective of physicians' functioning with regards to these dimensions. From a practical standpoint, it is hoped that this research will help those in the medical profession further

understand the experiences and needs of physicians, and in turn, consider how they can best support them in their quest to achieve and maintain wellness.

Methods

Research Design

This qualitative study represented the second phase of a larger mixed methods study on the well-being and self-regulation capacity of physicians (Simon & Durand-Bush, 2014), in which the participant selection model variation of a sequential explanatory design was employed (Creswell, Plano-Clark, Gutmann, & Hanson, 2003). In other words, the quantitative data collected and analyzed in the first phase were used to select participants for the second phase, of which the findings are presented in this paper. This design allowed for the integration of different methodologies to better understand a myriad of complex factors related to the psychological well-being and self-regulation capacity of physicians (Miller & Fredericks, 2006).

Data Collection and Analysis

Recruitment¹⁵. In the initial quantitative phase, contact individuals from provincial and national medical organizations sent an e-mail invitation on behalf of the researchers to practicing physicians in Canada, including resident physicians. This invitation comprised information about the study and ethical procedures, as well as a secure web-link to access a demographic questionnaire and a series of self-report measures¹⁶. Those willing to participate provided their informed consent online, after which they were prompted to complete the online demographic questionnaire and self-report measures. The participants were clearly informed that while anonymity was guaranteed, their responses would be tracked using a study identification number

¹⁵ Refer to Appendix G for documents related to permissions and recruitment.

¹⁶ Psychological Well-Being was assessed using the Scales of Psychological Well-Being (Ryff & Keyes, 1995), and Self-regulation Capacity was assessed using the Short-Form Self-Regulation Questionnaire (Carey, Neal, & Collins, 2004).

in order to identify potential participants for the qualitative phase of the study. After completing the self-report measures, participants were prompted to indicate whether or not they would be willing to partake in a follow-up interview (see selection procedures below). Ethics approval was obtained from the research ethics board of the educational institution where the research was conducted.

Participant selection¹⁷. The total sample from the quantitative phase ($n = 132$) was filtered to isolate participants who agreed to participate in a follow-up interview ($n = 79$). Using this participant subset, the next step in the selection process was to conduct a quartile split based on physicians' levels of self-regulation capacity (i.e., competence in planning, generating, controlling, and adjusting thoughts, feelings, and actions in order to achieve personal goals and adapt to changing environment; Simon & Durand-Bush, 2014) and psychological well-being (i.e., aggregate score from self-acceptance, autonomy, positive relations with others, environmental mastery, purpose in life, and personal growth scales, Carmondy & Baer, 2008; Ryff & Singer, 2006). Note that 'High' and 'Low' scores were relative only to those participants within the sample. For example, a physician categorized in the 'Low' quartile for self-regulation capacity did not necessarily possess poor self-regulation skills when compared to norms, but rather was considered 'Low' in relation to the other physicians included in the sample.

This led to the resulting four groups of participants:

- (1) low self-regulation capacity and low psychological well-being levels ($n = 11$);
 - (2) low self-regulation capacity and high psychological well-being levels ($n = 8$);
 - (3) high self-regulation capacity and high psychological well-being levels ($n = 12$);
- and
- (4) high self-regulation capacity and low psychological well-being levels ($n = 8$).

¹⁷ Refer to Appendix G for documents related to recruitment and consent for Phase 2.

The rationale for sampling from these four groups was to maximize variation and gather data from physicians who had high levels of self-regulation capacity and psychological well-being, low levels of self-regulation capacity and psychological well-being, and a combination of these. This was important given the exploratory nature of the research.

Participants within each group were identified by and ordered based on their case number and not their self-regulation capacity and psychological well-being scores. They were contacted to participate in a follow-up interview following this order in order to promote maximum variation and chance of being selected within each group. Once a participant from a particular group agreed, declined or did not respond to the request to partake in the interview, the next potential interviewee from that same group was contacted. This process continued until the recruitment goal of 12 participants was satisfied, with three in each of the four groups. Given the data saturation guidelines proposed by Guest, Bunce, and Johnson (2006) and the scope of the present study, this number was deemed appropriate.

The primary researcher, who was also the interviewer, was blinded to the group in which the participants were categorized in order to reduce any potential bias during the interview, and was only privy to demographic information. Essentially, this prevented the researcher from having any prior knowledge of the participants' levels of psychological well-being and self-regulation capacity.

Of the 12 participants, 10 were women and two were men. Furthermore, there were five physicians and seven resident physicians. Years of experience varied from 15 to 30 years for physicians and one to four years for resident physicians. Physicians were 40 to 59 years old while resident physicians were aged 26 to 30 years. Primary medical specialties included family medicine ($n = 5$) and pediatrics ($n = 2$). The other five participants were specialists in orthopedic

surgery, obstetrics and gynecology, anesthesiology, internal medicine, and medical genetics. In terms of geographical location, four participants were from eastern Canada, two were from central Canada, and six were from Western provinces. Overall, the characteristics of this sample are fairly proportionate to that of the larger sample ($n = 132$) from which participants were selected.

Semi-structured individual interviews. The 12 physicians took part in an individual, in-depth, digitally audio-recorded telephone interview (Creswell, 2007), lasting between 60 to 90 minutes. While they participated in a single interview conducted over the telephone given the extreme demands and time constraints they faced and their distant place of residence, a semi-structured interview guide¹⁸ (Rubin & Rubin, 2005) allowed to thoroughly question them on their experiences of psychological well-being based on the six dimensions described by Ryff and Keyes (1995). The interview guide was developed by translating into questions the definitions and characteristics of each dimension of psychological well-being. It was pilot tested with a healthcare worker and a physician, and their feedback (e.g., clarity and relevance of concepts and language, length of guide) was used to revise the guide accordingly. Refer to Table 1 for a summary of primary and follow-up questions. The use of this guide provided a platform to deductively explore physicians' experiences based on Ryff and Keyes' framework, while remaining flexible enough to inductively allow for content to emerge. This was particularly important given the lack of understanding of physician well-being from a positive psychology perspective.

Qualitative content analysis. After each interview was transcribed and filtered for grammatical errors, a content analysis was performed in order to analyze the data through a systematic identification and classification of codes and themes (Hsieh & Shannon, 2005). After

¹⁸ See Appendix L.

a thorough review of the 160 pages of single-spaced transcripts, the text data was divided into meaning units (i.e., separate pieces of text that represented a specific idea) and subsequently labelled with a code that reflected its content. Codes were then regrouped under higher order themes, both of which were deductively created based on Ryff and Keyes' (1995) psychological well-being framework or inductively derived from open-ended questions such as, "What inhibits your psychological well-being?" (Hseih & Shannon, 2005). Data saturation was perceived to have been achieved given that by the 12th interview, the first and second levels of codes were consistent (i.e., no new ones were created). It was merely the examples of experiences provided by the participants that changed.

Trustworthiness. In order to enhance the trustworthiness of the study, all transcripts were sent to the participants for authentication prior to the content analysis (Guba & Lincoln, 1994). Only minor changes to two transcripts were suggested and were made accordingly. Furthermore, coding accuracy was verified (Lombard, Snyder-Duch, & Bracken, 2002) based on Lacy and Riffe's (1996) recommendations. Two independent researchers coded 40 randomly selected meaning units (10% of the total) using the coding scheme developed from the content analysis, which yielded acceptable reliability coefficients of .77 and .80 (Lombard et al., 2002). This process allowed the primary researcher to further clarify the coding scheme.

Results

Table 1 provides a summary of physicians' experiences of the different dimensions of psychological well-being. Examples of citations demonstrating high and low functioning (when applicable) were provided based on primary or secondary questions posed during the interviews. Overall, regardless of the four groups from which the physicians were selected, all 12 of them reported experiencing a range of high and low functioning across four of the six dimensions of

psychological well-being including self-acceptance, positive relations with others, autonomy, and environmental mastery. With regards to the other two dimensions, that is, purpose in life and personal growth, all of the physicians mainly reported high levels of functioning. Most physicians noted that their level of functioning varied not only across dimensions but also over time and across contexts (e.g., family versus work), thus their functioning level was dynamic as opposed to static.

(Insert Table 1)

Figure 1 provides a visual synthesis of the dimensions addressed in Ryff and Keyes' (1995) scales of psychological well-being framework (i.e., PSWB) and the themes deductively and inductively derived from the content analysis. This figure is novel given that Ryff and Keyes' research has been predominantly quantitative and their framework is reflected through a questionnaire that has never been qualitatively adapted and visually depicted. As a complement to Table 1, this figure focuses on positive psychological functioning and well-being enhancing actions discussed by the physicians (e.g., value and engage in ongoing learning). The most salient theme in this figure pertains to the notion of *balance* between physicians' professional and personal life, that is, the negotiation between - and the attention given to - the two contexts. This was particularly relevant for the dimensions of self-acceptance, positive relations with others, and environmental mastery. Aside from the dimension of personal growth, the physicians' positive psychological functioning across the other five dimensions was a reflection of actions in both their personal and professional life. Detailed results pertaining to Table 1 and Figure 1 are presented below.

(Insert Figure 1)

Dimensions of Psychological Well-Being

Self-acceptance. Physicians reported experiences of both high and low functioning with regards to self-acceptance. They noted that an important part of experiencing self-acceptance was related to their capacity to value and effectively manage multiple roles or identities (e.g., physician, family member, friend). This required them to balance their personal and professional life, while accepting the challenges inherent in their medical practice. Furthermore, those who felt a high sense of acceptance reported an overall sense of satisfaction with their past and present life (both personal and professional), as well as feelings of accomplishment and pride. Conversely, physicians who lacked self-acceptance noted that medicine tended to overwhelm (e.g., take unwanted priority over) their personal life, and they identified feelings of dissatisfaction and discouragement. Several others reported both high and low experiences, noting a sense of satisfaction with their medical career but not with their personal life. Regardless of whether or not physicians felt they were able to nurture both personal and professional aspects of their self, there was general agreement that achieving and maintaining a satisfying balance was challenging.

Personal growth. Unlike the other four dimensions of psychological well-being explored in the present study, an overwhelming majority of the physicians reported experiencing a clear sense of personal growth and purpose in life. Most of the physicians shared experiences of high functioning when questioned about personal growth as the latter is an intrinsic part of medicine. In fact, being a lifelong learner was viewed as an important quality of effective physicians. Interestingly, several reported that ongoing learning and professional growth constituted their rationale for entering medicine and remained a renewable source of motivation.

Purpose in life. With regards to purpose in life, the physicians' high functioning was attributed to specific actions they sought in their medical (e.g., make a difference in patients' life, apply medical skills to the best of their ability) and personal (e.g., be the best partner/family member/friend they can be, make the community a better place) contexts. Overall, their sense of purpose served as a powerful motivator and was linked to self-actualization and personal growth, and many expressed a deep sense of pride in their medical career and meaningful contributions.

Positive relations with others. Positive, high-quality relations with others were of particular importance to all physicians, as they perceived them to be a central indicator of their overall well-being. Like self-acceptance, there were reports of high and low functioning when physicians discussed their experiences of this dimension. High functioning was often tied to their capacity to experience and balance satisfying relationships in their medical (e.g., with patients, colleagues) and personal (e.g., with family, friends) environments. A unanimously identified indicator of high functioning for this dimension was their understanding of the give and take of social relationships. For instance, on both personal and professional levels, the physicians felt that high functioning was associated with both "giving and taking" support, guidance, acceptance, and connectedness. Although the majority felt satisfied with their professional relationships, their personal relationships often took an unwanted secondary position, leading them to feel socially disconnected from their family. Maintaining positive relations within this context was a common challenge.

Environmental mastery. Although nearly all of the physicians reported a high sense of mastery within their medical environment (e.g., competence in performing medical skills), the same could not be said about their capacity to manage day-to-day activities in their personal life. However, those who reported a high level of functioning for this dimension attributed this to

factors such as effective planning and time management. They also noted that their desire to balance their professional and personal life played a role in their choice of medical specialty. They emphasized the importance of taking personal needs and values into consideration while carving out their niche in medicine.

Autonomy. Physicians reported high and low functioning with regards to autonomy. In general, they felt that self-determination evolved with experience and tended to be lower during medical training when they had less control over their environment (e.g., schedule, rotations). Autonomy was also contextual in that some felt autonomous in their personal life but not in their professional life. Among those physicians who reported high functioning, there was a sense of control over their behaviors and a focus on internal (e.g., personal thoughts, emotions, responses) as opposed to external/uncontrollable factors (e.g., work schedule, patient demands). The most common discourse pertained to the importance of considering both internal and external expectations and evaluations, with an emphasis on internal ones. Interestingly, several physicians pointed out that the relative value placed on the expectations and evaluations of others (e.g., colleagues, mentors, preceptors, partners) depended on the nature and strength of their relationship with them. For instance, they were more inclined to consider the expectations and evaluations of those with whom they had an established, high quality relationship.

While nearly all of them noted that a lack of control was a barrier to their autonomy, those highly functioning were able to remain self-determined and mitigate the negative impact of this lack of control by focusing on what they could manage (e.g., exercise, diet) as opposed to what was outside of their control (e.g., patient needs). Conversely, low functioning physicians drew attention to the negative impact that low autonomy had on their well-being. For instance, a

lack of logistical control (e.g., scheduling) was viewed as a central catalyst and led to negative consequences (e.g., emotional exhaustion, feelings of apathy, and cynicism).

What Inhibits and Enhances Well-Being

Another objective of the present study was to explore physicians' perceptions regarding what enhances and inhibits their well-being. Among the most compelling themes, the inability to balance one's personal and professional life, and the medical culture reportedly inhibited the physicians' well-being. Work-life balance was a very real and often daily barrier for physicians in this study. Interestingly, although the majority of them acknowledged that the medical profession is increasingly prioritizing physician wellness, many ingrained aspects of medical culture (e.g., long work hours, high expectations, multiple complex demands) still contribute to adverse wellness outcomes. The physicians also reported a general sense of discomfort in asking for guidance to enhance their well-being, as well as feelings of intimidation, and a fear of negative judgment and/or reprisal (e.g., from colleagues or supervisors). This stigma appeared to persist beyond medical training, as noted by several more experienced physicians, and was attributed to a cultural reluctance to adapt to changes in the medical profession.

Conversely, many factors were perceived to facilitate physician well-being, the most notable of which were positive social modeling and attitudes, especially under challenging circumstances. Physicians reported that maintaining a positive attitude towards themselves (e.g., "I'm confident I can do this"), and situational factors (e.g., "this is a good teachable-moment so we should discuss this"), and not dwelling on elements they could not control made them feel more resilient. With respect to social modeling, several of the more experienced physicians who had an adequate level of well-being felt a certain responsibility to serve as a role model for the next generations. This was echoed by many of the residents, who offered that they valued

positive role models (e.g., with respect to health and wellness behaviours), although they did not regularly experience such modeling from others.

Discussion

In a medical field constantly in a state of flux, there has been growing support to explore the psychological well-being of physicians beyond negative behavioral indices. The present study highlighted the in-depth experiences of multiple dimensions of psychological well-being in a sample of physicians. It shed light on their high and low functioning capacity and their perceptions of what enhances and inhibits their well-being.

Figure 1 was created to highlight Ryff and Keyes' (1995) dimensions of psychological well-being deductively derived from the physicians' interviews as well as inductively derived themes relevant to the physicians' context. Indeed, the uniqueness of this model is that it is context-specific and it focuses on well-being enhancing actions related to positive psychological functioning. The notion of balance between physicians' professional and personal life emerged as the most overt theme in this figure, particularly for the dimensions of self-acceptance, positive relations with others, and environmental mastery, which was not underscored in Ryff and Keyes' (1995) original work. This theme of balance will be revisited throughout the subsequent discussion.

Although physician wellness has rarely been studied using a wide range of dimensions, many of the findings of this study resonate with the literature. In the case of the self-acceptance dimension of psychological well-being, the high functioning physicians' emphasis on the importance of possessing, balancing, and nurturing multiple identities echoes an important quality of exemplary physicians (Meldrum, 2010). Conversely, some low functioning physicians' feelings of dissatisfaction and discouragement about their career choice coincide with reports

that physicians are often overworked, exhausted, and experience helplessness (Gautam, 2009). Overall, physicians shared that achieving and maintaining a satisfying balance can be challenging, and their personal life can take an unwanted backseat to their medical career. This suggests that helping physicians to value, accept, nurture, and feel satisfied with their important identities in their personal and professional life appears to be a worthwhile endeavor.

With regards to personal growth and purpose in life, physicians reported high functioning, regardless of the overall high or low levels of psychological well-being and self-regulation capacity they reported in the initial quantitative phase of the research (Simon & Durand-Bush, 2014). For example, they did not hesitate to articulate their values and purpose in life, which was not surprising given the high degree of commitment to training and practice required in this profession. Value congruence has been shown to predict medical efficacy, as well as lower levels of distress (Devi, 2011; Leiter, Frank, & Matheson, 2009) and burnout (Shanafelt et al., 2003) in demanding work environments. Thus, if a clear sense of purpose is indeed linked to such tangible benefits, helping physicians become aware of, or reconnect with what is meaningful in their work could potentially offer them protection from adverse outcomes, as well as enhance their overall wellness (Krasner, Epstein, & Beckham, 2009).

The physicians also unanimously identified personal growth as an important personal and professional source of well-being, and an intrinsic aspect of medicine. Becoming a lifelong learner is a long established tradition in medicine (Harvey, Rothman, & Frecker, 2003; Violato & Lockyer, 2006), and explains why many medical licensing boards require evidence of participation in continuing medical education programs to maintain licensure (Duffy & Holmboe, 2006). Unfortunately, although many opportunities exist to expand one's medical skills, those targeting personal wellness are less common. Moving forward, there appears to be

value in helping physicians learn how to determine their own needs, set goals, and engage in appropriate ongoing learning activities that can help them reach and maintain not only professional competence, but also personal well-being (Mann & Gelula, 2003; Violato & Lockyer, 2006).

It is widely known that physicians face unique demands and responsibilities, which often take a heavy toll on their social life (Solberg et al., 2012). Thus, it was not surprising that all physicians underscored the importance – and relative challenge – of maintaining positive relations with others in their medical and home environment. Not all physicians felt that they consistently experienced positive social relationships in their professional and personal life, which supports findings in the literature. For example, physicians, in general, report lower levels of social functioning than comparable peers in other professions (Stavem, Hofoss, Aasland, & Loge, 2001; Tyssen, 2007). This should be further explored because social support has been shown to be a protective factor against dysfunctional outcomes for physicians (Panagopoulou, Montgomery, & Benos, 2006). For example, supportive work environments and relatedness to patients have an inverse relationship with emotional exhaustion and depersonalization, which are symptoms of burnout (Eckleberry-Hunt et al., 2009). Generally, results demonstrate the importance of nurturing physicians' capacity to maintain high quality and satisfying relationships at work and at home. There may also be benefits in helping physicians focus not only on what they give to others (e.g., knowledge, support) but also what they receive from them in order to continuously feel renewed, valued, and connected.

Physicians who reported a high degree of mastery over their environment attributed this to their capacity to effectively manage tasks and fulfill responsibilities in both their personal and medical life. Choosing or creating contexts (e.g., select particular medical specialty, open private

practice) that were conducive to meeting personal needs (e.g., control work hours to be able to spend more time at home) was also discussed. Indeed, Devi (2011) found that physicians who choose a medical specialty based on personal values fare better than those who do not (e.g., choose family medicine/general practice over surgery because they value schedule control and patient contact). Comparable findings were also reported by Wallace and Lemaire (2007) and Solberg et al. (2012). However, similar to Solberg et al.'s (2012) findings, physicians indicated that maintaining balance on a long-term basis is a considerable challenge. This suggests that physicians may need help to achieve a realistic and attainable work-life balance that aligns with personal needs and values. Examples of strategies identified by the participants in this study to help achieve this balance (e.g., strategic planning and time management) have been noted by other researchers (Eckleberry-Hunt et al., 2009; Meldrum, 2010). Thus far, the recurrent balance theme across several dimensions of psychological well-being in this study appears to be significant and should be further examined in future studies.

Perceived autonomy in one's medical practice environment is another important dimension of well-being (Freeborn, 2001). Physicians with a greater sense of control over their work tasks have higher levels of satisfaction (Arnetz, 2001). Conversely, low control (e.g., over scheduling) and high demands are associated with feelings of pessimism (Eckleberry-Hunt et al., 2009) and a myriad of mental health issues among physicians (Tyssen, 2007). The physicians in the present study noted experiences of high and low functioning with regards to autonomy. Their perception that autonomy tends to be lower among medical students and resident physicians is supported by previous studies. For instance, Aalsland, Rovik, and Wiers-Jenssen (2008) found that resident physicians often have heavier workloads and less autonomy compared to more senior physicians. They are more likely to experience burnout due to factors related to low

control (Leiter et al., 2009). While both the causes and consequences of low autonomy among physicians are well established, methods to help physicians feel more autonomous during their training and subsequent practice are far less understood. The corroborating experiences of physicians in this study show the need to further examine how the negative effects of reduced autonomy in the medical workplace can be mitigated.

According to Ryff and Keyes (1995), another important indicator of high autonomy is one's focus on internal as opposed to external expectations and evaluations. Interestingly, although the experiences of physicians in the present study generally support this, there also seems to be value in considering both – especially given that performance standards and feedback from others are important aspects of medical practice. It appears that little is known about the dynamic inter-play between physicians' internal and external expectations and evaluations, and the impact this inter-play may have on physician well-being. As such, this warrants further study.

What Enhances and Inhibits Well-Being

When physicians were asked to discuss what enhances and inhibits their well-being, the inability to balance their personal and professional life, and medical culture were commonly perceived as barriers. This supports Gautam's (2009) report, showing that only 57% of physicians perceived to have a sense of work-life balance. The fact that the medical culture was also perceived as a barrier may partly be due to the longstanding belief that excessive demands and stress are an inherent, albeit highly undesirable, aspect of medicine (Gardiner et al., 2004; Schattner & Coman, 1998). These types of challenges have been linked to organizational antecedents (Tyssen, 2007), with origins in medical training (Devi, 2011). For instance, young physicians report discomfort in asking colleagues for help (Rosvold & Bjertness, 2012), and

nearly three quarters of resident physicians admit to experiencing intimidation at work (Cohen & Patten, 2005). Overall, there appears to be an inability, or reluctance, to adapt to the changing nature of medical practice. Unfortunately, while up to 25% of physicians face mental health challenges that interfere with their practice (Gautam, 2009), they typically underuse mental-health services available to them (Forsythe & Calnan, 1999; Tyssen, 2007). This could in part be attributed to a prevailing stigmatization of physician well-being (Canadian Medical Association, 2003; Wallace & Lemaire, 2007). Moving forward, it may be of value to consider adopting more social-ecological frameworks, integrating models of physician and organizational well-being (Arnetz, 2001) to address this issue. Such approaches would allow physicians to look critically at their own practices, get feedback (Violato & Lockyer, 2006), and help change the medical culture beyond viewing physicians as a set of competencies (Gautam, 2009).

With respect to what enhances well-being, the two most recurring factors were positive social modeling and attitudes. Indeed, while pessimistic or negative attitudes are associated with physician burnout (Eckleberry-Hunt et al., 2009), maintaining a positive outlook within one's life has been identified as an effective preventative strategy (Meldrum, 2010; Spickard, Gabbe, & Christensen, 2002). This may demonstrate how some physicians are able to maintain a sense of wellness while others cannot, under similar conditions. Maintaining a positive attitude may help physicians avoid experiencing adverse reactions (e.g., feeling victimized or disillusioned). Physicians in this study emphasized the importance of focusing on the elements of their experiences that were positive and within their control.

Similar to what Meldrum (2010) proposed, the majority of the physicians in this study believed that resident physicians and experienced physicians alike could benefit from learning from others who are able to effectively regulate their well-being. The need for effective role

modeling during the medical training process has been well documented (Wright, Kern, Kolodner, Howard, & Brancati, 1998). It is particularly important in helping shape trainee ethics, values, and attitudes (Branch, Kroenke, & Levinson, 1997). The modeling of strategies to manage career-related decisions and collegiality may help physicians to thrive in their medical environment (Eckleberry-Hunt et al., 2009). Consequently, in an era of increasing pressures and responsibilities, physicians who are “well” should find ways to reach out to others in order to urge better self-care (Ahmad, 2010; Brazeau, 2010). Unfortunately, specific methods to actively model positive health and wellness behaviors remain largely unclear and should be further explored (Spickard et al., 2002).

Finally, another important finding that emerged from this study is that the physicians’ experiences of psychological well-being varied across contexts. For instance, there were often differences in their experiences of a particular dimension between their personal and professional life. Using the example of self-acceptance, some physicians were highly satisfied in their professional environment but dissatisfied in their personal life. It thus appears to be important to consider the contextual interplay between physicians’ professional and personal life when interpreting their experiences. Ryff and Keyes' (1995) current descriptions of high and low functioning for each dimension of psychological well-being may not be sensitive enough to capture the intricacies of physicians' desired balance between their professional and personal life. It is unclear if this is unique to physician populations, or if it is a common aspect of psychological well-being experiences of individuals performing in other challenging contexts as well. When using Ryff and Keyes' (1995) multidimensional framework in future studies, researchers should more systematically investigate physicians’ professional and personal contexts – as opposed to capturing their general or overall perspective. Figure 1 clearly

highlights the importance of exploring both contexts when investigating and nurturing positive psychological functioning among physicians and could serve as a springboard for future research and interventions.

Limitations

Despite the steps taken to maximize the trustworthiness of this study, limitations must be considered. For instance, social-desirability is an inherent reality of self-reported data (McBurney, 1994). As such, it is possible that the participants may have either exaggerated their experiences in order to make their situation seem better or worse, or under-reported the severity or frequency of experiences in order to minimize their issues (Aiken, 1997). However, physicians were told that there were no right or wrong answers and were asked to be honest. Since participation was voluntary, the physicians' motivation for participating was not known and this may have had an impact on the results. Also, eliciting a qualitatively rich portrait of these physicians' experiences of psychological well-being took precedence over the ability to generalize findings to the broader population of physicians. While the number of participants was deemed appropriate given the research questions and Guest et al.'s (2006) recommendations for sampling in qualitative research, the limited sample of physicians in this study should be taken into consideration when interpreting the findings.

Concluding Remarks

Growing contemporary challenges, compounded by omnipresent occupational health risks and demands in the medical profession (Arnetz, 2001), illustrate why physician well-being is becoming a public-health issue with a clear societal cost (Devi, 2011; Eckleberry-Hunt et al., 2009). Despite the links between healthy physicians and a sustainable healthcare system (Gautam, 2009), the stigma surrounding physician well-being remains a significant barrier, and

may explain why little attention has been given to this area of research compared to what has been invested in other stressful occupations (Tyssen, 2007). Indeed, a historical focus on negative outcomes has resulted in an incomplete view of physician well-being (Spickard, 2001). However, investigating dimensions of positive psychological functioning in the current study and creating a preliminary conceptual model to depict key findings (see Figure 1), mark additional steps towards conceptualizing physician well-being as more than the presence or absence of negative factors (Searle, 2008).

Specifically, physicians' psychological well-being in this study reflected both high and low functioning experiences for the dimensions of self-acceptance, positive relations with others, autonomy, and environmental mastery, and mainly high functioning experiences for purpose in life and personal growth. Physicians were able to contextualize their experiences and report fluctuations in their well-being based on their professional and personal life. It became evident through the data that balance was an important factor. The difficulty they perceived in balancing their professional and personal life supports the literature, demonstrating that managing work-life balance is a growing issue in the profession (Shanafelt et al., 2003). Well-being challenges were also related to cultural factors such as stigma (Canadian Medical Association, 2003). Finally, positive social modeling and attitudes were perceived to enhance psychological well-being, which may have practical implications for medical training and practice.

In sum, the wide range of experiences the physicians shared in this study suggest that psychological well-being is unlikely attributable to any one factor, but rather involves a constellation of individual, social, and environmental factors (Tyssen, 2007). Future research should build on these findings and incorporate indicators of positive functioning into more longitudinal and/or ecological designs with larger, representative samples. Results of the present

study promote an emerging sense that physicians and medical organizations alike must begin to adopt a more introspective and proactive role in the promotion of optimal physician well-being (Eckleberry-Hunt et al., 2009; Riley, 2004), devote more attention to nurturing wellness, and not just work to fix what is broken (Shanafelt et al., 2003).

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Table 1

Physicians' Experiences of Psychological Well-Being (PWB) Dimensions Based on High and Low Functioning

PWB Dimension and Corresponding Interview Question(s)	Level of Functioning with Sample Quotation
Self-Acceptance PQ: How would you assess yourself, past and present (e.g., level of satisfaction)? SQ: How would you evaluate the multiple aspects of your life?	High: <i>"... [Fostering multiple identities] is very important for me, I can't just be a one-dimensional person ... I think they are necessary in order to become better in any one of them – to be a better physician, or better parent. [It is important to] have different experiences to draw on ..."</i> (P6) Low: <i>"... I am not satisfied with the life resulting from [my medical career] ... I question whether or not I did the right thing – is [medicine] worth it? ... I look at [more experienced] physicians around me; their balance isn't any better than mine. [During training] there was no end to the people who say, 'you thought medical school was bad, residency is worse'. In residency they said, 'you thought residency was tough, wait 'till you have your own practice'. Where does it end? It's discouraging ... you ask yourself if you're on a train heading to where you want to go".</i> (P3)
Personal Growth PQ: Describe the importance you ascribe to continually expanding/building on your personal and professional skills.	High: <i>"... You need to continue to learn, to make sure that you are up to date with everything, and/or are comfortable with your skills and competencies. Medicine is a journey that does not stop – you need to continually expand. That's the thing for relationships as well – at home – none are perfect, and you have to keep working at them in order to get the most from them. It's a cycle where you're continuing to learn – it never stops."</i> (P4) High: <i>"[Expanding/building my personal and professional skills] is very important. You have to keep building on the skills that you have. I feel the better you are at something the more you should work [to improve] and continue to excel at it. It is also important that you share what you have with others, to help them grow – pass on that knowledge."</i> (P2)

Purpose in Life	High:
PQ: What is your purpose in life (e.g., sense of meaning/contribution)?	<i>"... I think my purpose in life is to ... be the best physician I can be! ... Essentially, this means to be competent professionally and technically, and also to establish a relationship with the person you are working with. When people go to a doctor, they don't necessarily just want tests to be ordered – they want to be heard, understood, and made to feel that their doctor is taking care of them, and doing everything they can to help them – that's what I want to give to [my patients] ..."</i> (P10)
SQ: What sense of direction do your goals, beliefs, and values give you?	High: <i>"[My goals, beliefs, and values] are the pillar by which everything in my life is built – from which my behaviors and actions permeate ..."</i> (P5)

Positive Relations With Others	High:
PQ: How would you describe the quality of your relationships with others in your life?	<i>"... I can't imagine going to work where I didn't get along with the people I work with. In the past I've been in a group that I didn't mesh with, and it was awful – I didn't love going to work. Everything becomes miserable. It's amazing how it's all connected in that not having those positive relationships can topple other things. If you are miserable at work, when you get home you are miserable – the two feed off of each other."</i> (P12)
SQ: How would you describe the importance of maintaining social relationships?	Low: <i>"I don't think some of my work [relationships] is where I want it to be. There are several things I would like to do at work with which I would like to be successful and I have not been able to do because of it ... [For instance] I have seen some colleagues who are so stuck in their ways, and will practice medicine in their methods regardless of what I or anyone else say – that is frustrating. When I want to try and make changes – such as adapting to do things differently – it is difficult to get everyone at our practice on board ..."</i> (P9)
SQ: What do you receive on a personal level from social relationships with others (and vice versa)?	

Environmental Mastery

PQ: How would you describe your ability to manage your work environment as a physician? Your personal life?

SQ: Are you able to balance the various day-to-day personal and professional activities within your life? Is so, how do you manage this balance?

High:

"No matter what is going on in my life outside of medicine I find I am still able to get through work really well – even if I am having a bad day. If something is not going well in my personal life, I feel I am able to leave it at home and not bring it to work – whether I am at home or at work, I find I am able to 'flip the switch' [to that mode]". (P11)

Low:

"... [Medicine] overpowers my life right now ... I'm always on call. The pager is always attached – even if I go out, even if I'm [in bed], it does not matter. I still have to go in. Medicine is always still there –it's in front of your face. I am never able to leave work behind – it's always in the back of my mind." (P1)

Autonomy

PQ: How much control do you feel you have over your behavior and actions (e.g., sense of self-determination)?

SQ: How important is it for you to fulfill the personal and professional expectations you have of yourself? Others?

SQ: In evaluating your behaviours and actions, do you put more emphasis on internal (self) or external (others) evaluations?

High:

"I feel self-determined ... [even though] I may not have control over what is going around me, I feel like I always have control over how I react to it ... the key is that I know can choose how I react to situations ..." (P7)

Low:

"I found it difficult in residency. It was a bit of a learning curve, worrying about how others may be judging me and trying to figure out what everyone was expecting from me, or worrying about what people are looking for from me on a certain rotation – that drove me crazy ..." (P8)

Note. PQ = Primary question; SQ = Secondary (follow-up) question; P = Participant.

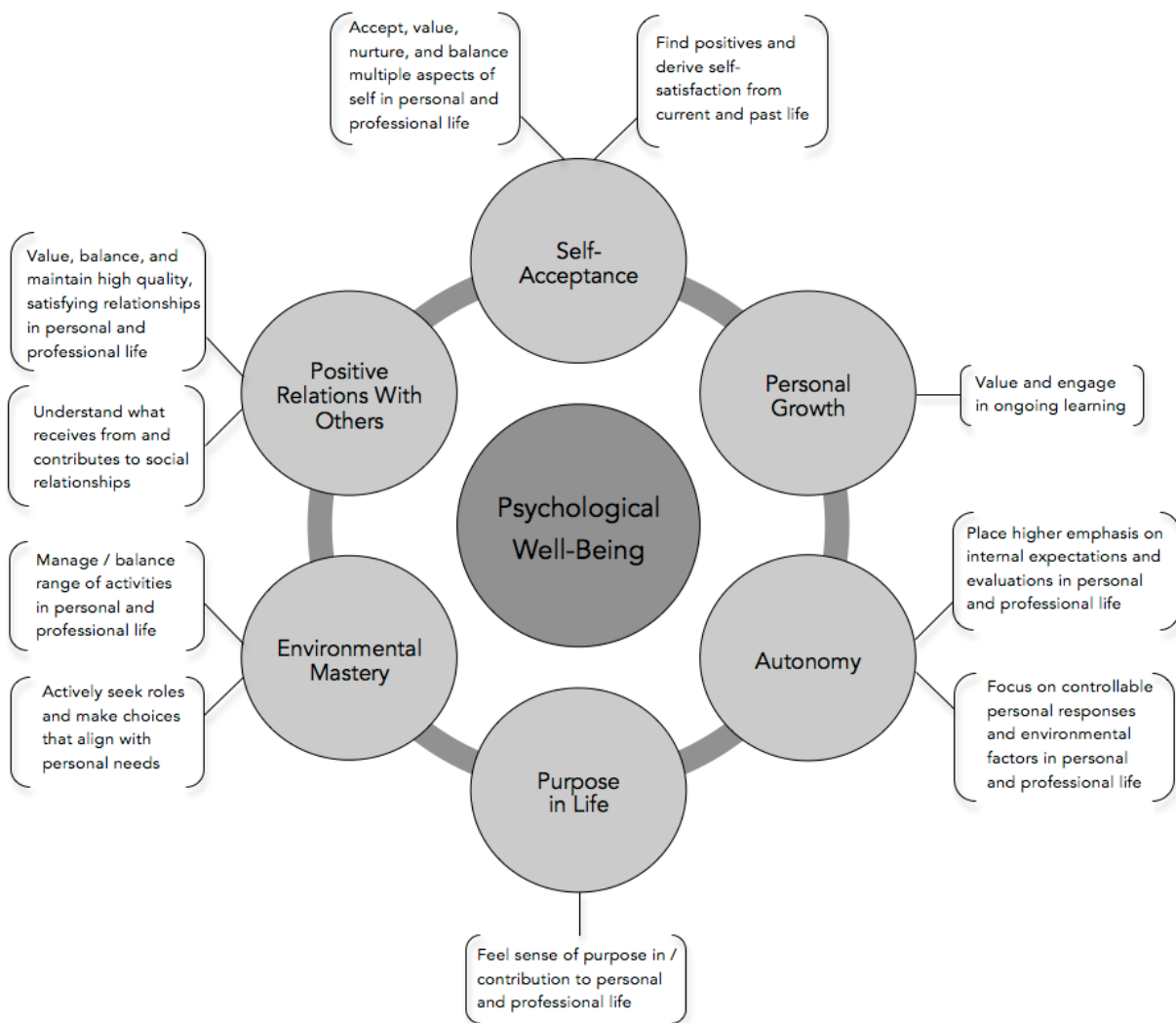


Figure 1. Multidimensional Model of Psychological Well-Being of Physicians (adapted from Ryff & Keyes, 1995)

Supplemental Results

Although not addressed in the three feature articles, another important objective of this thesis pertained to the physicians' experiences of self-regulation. In particular, we were interested in qualitatively examining physicians' self-regulation experiences, the role they perceived their self-regulation capacity to play in their well-being, and what enhanced and inhibited their self-regulation capacity. Results are presented in this supplemental results section rather than in an article format due to time constraints. They will, however, be integrated into a manuscript for publication in the near future.

The social-cognitive processes and sub-processes described by Zimmerman (2000) and Bandura (1991) were integrated into a semi-structured guide used to conduct the interviews with the 12 participants in Phase 2 (see Feature Article 3 for the data collection and analysis procedures for Phase 2 and Appendix L for the interview guide). Within the content analysis performed to analyze the data pertaining to self-regulation, themes (e.g., task analysis) regarding physicians' experiences of self-regulation were deductively generated based on Zimmerman's (2000) SCM phases (i.e., forethought, performance, self-reflection), which were rooted in Bandura's (1991) SCT (see Appendix B for integration of SCM and SCT). Inductively derived themes (e.g., mindfulness, resilience) were associated with the role physicians perceived their self-regulation capacity to play in their well-being, and what contributed to their capacity or incapacity to self-regulate. These phases and themes are presented below and supported with representative citations from the transcribed data when appropriate.

Physicians' Experiences of Self-Regulation

Overall, the 12 physicians reported a range of experiences with respect to the self-regulation processes and sub-processes depicted in Zimmerman's (2000) SCM, that is, those

related to the forethought (i.e., task-analysis, self-motivational beliefs), performance, (i.e., self-observation, self-control), and self-reflection (i.e., self-judgment, self-reaction) phases.

Regardless of the category from which the physicians were selected for Phase 2 (i.e., based on their high and low self-regulation capacity and psychological well-being scores - not known by the primary researcher who interviewed them), all of the physicians were able to discuss various self-regulation experiences. The interview questions were not formulated in a way to clearly depict those with high and low self-regulation capacity, however, the physicians provided both effective and ineffective self-regulation examples, particularly when asked about factors that inhibited and enhanced their self-regulation capacity.

Forethought phase. With regards to the forethought (i.e., preparation for performance) phase, the physicians discussed several sub-processes related to task analysis and self-motivational beliefs.

Task analysis. This process was explored by asking the physicians about the goals they set for themselves in their personal and professional life including the sources of these goals, and whether or not they established and followed a plan to achieve them. Indeed, discussing goals was an important initial step in understanding how physicians self-regulate. As a highly individual process, goal setting took on a variety of meanings for the physicians, but it generally involved establishing multiple professional and personal related goals. For instance, maintaining personal relationships outside of medicine (personal), and striving to reach their potential and continually improve their medical skills (professional) were commonly identified goals:

“[Professionally] my biggest goal is to challenge my limits ... feeling really confident with my physical skills, but also working to improve in places that are not as good – such as dealing with patient deaths or talking to families ...” (P1). Another common theme was the importance of

setting process goals (e.g., keeping up with the medical literature) linked to larger, more global goals (e.g., being a well-rounded, up-to-date physician).

With respect to the sources of their goals, the physicians overwhelmingly identified a combination of internal and external sources. On the one hand, they relied on personal experiences and thoughts to help guide and prioritize what was important to them (internal), but also often considered the perceptions of preceptors, colleagues, friends, and family (external):

It's important to be able to compare with performances of others to see where I stand – and to be able to adapt ... I feel it is important to be able to take those goals from within and compare yourself within external sources ... in order to match your personal goals with what is expected of you. (P2)

In striving to attain desired goals, the physicians emphasized the importance of establishing plans. Whether done in a formal or informal fashion, strategic planning was viewed as an active component of goal attainment, which involved self-awareness and prioritization.

One physician stated:

I regularly meet with both my staff and associates so that everyone has the chance to talk about how things are going and to catch problems – it's a deliberate strategy ... I also try to limit what I say yes to, personally and professionally. In the past I was easily overextended, and learned that I needed to be able to stop and ask myself if I really have time to be a part of this or that committee ... [For example] I've had trouble with anxiety lately and I dropped some peripheral responsibilities. ... I've [learned to accept] that I have limits, and being OK with staying within them is important. (P12)

Self-motivational beliefs. The achievement of personal goals is linked to self-efficacy and intrinsic interest. When asked about their confidence in achieving the goals they set for

themselves, the physicians' responses differed. Some were optimistic while others were more pessimistic. Furthermore, their self-efficacy and intrinsic interest varied across contexts and situations (e.g., confident in performing a particular procedure, but not confident in delivering unfavorable news to patients). Among the physicians who noted a high level of confidence regarding goal attainment, they emphasized the importance of setting realistic expectations:

If I set a goal, I expect to achieve it – or at least some permutation of it ... although I set realistic goals, sometimes along the path to achieving it, I find out that I didn't know what I was getting into. [In such cases], I adjust my expectations based on circumstances and [current] realities. (P7)

Indeed, ongoing re-evaluation of expectations was raised by many of the physicians as an important process in adapting to the dynamic nature of medical practice.

Conversely, those physicians who did not share a sense of optimism with respect to goal attainment attributed this to a variety of factors (e.g., lack of personal time, general lack of self-confidence, negative outcome expectations):

I am an eternal pessimist. ... I don't feel confident that I am going to reach my goals – that's why I don't set many. ... Self-confidence is not something that comes easily for me, and I always feel like I am going to come up short. ... I am much harder on myself than perhaps I should be, even with goals that I do eventually meet. (P1)

Overall, the physicians associated their level of self-efficacy and outcome expectations to the level of interest they had in their goals: "If my goal or standard is something that is important to me, it will work. I am confident that I will achieve what I want ..." (P9).

Performance phase. With regards to the performance phase, the physicians discussed the self-control and self-observation sub-processes they used to manage themselves while

performing in the moment. For example, they described strategies allowing them to focus on the tasks required to achieve their goals. However, in comparison to the forethought and self-reflection phases, the data pertaining to the performance phase was more limited. This is likely due to the fact that their discourse often shifted from forethought to self-reflection, with some links to their "in the moment" performance.

Self-control. The physicians used different strategies to remain in control of themselves while performing in their environment. They discussed examples of changing their mindset when facing task components that were out of their control (i.e., task strategy), using positive self-talk under pressure (i.e., self-instruction), and focusing on goal attainment (i.e., attention focusing): "The more important or invested I am in a goal, the more focused I am on the strategies I use to reach it" (P3).

Self-observation. The physicians also reported using self-recording strategies such as note taking and engaging in meta-cognitive monitoring: "I tend to think it through, take a step back, see how my actions influence things ... If I think of something I could have done better, I learn a lesson and try to modify my behaviour ... [I try] catching myself, and try to change it in that moment" (P9). Another example of this meta-cognitive sub-process includes:

For little things, I just kind of react in the moment, and for bigger things that I have had on my mind for a long time or chastised myself for not doing previously, I tend to think about it more before I react or act. Well I stop for a minute and think about what it was that I did, why I did it, was I happy with the result, and then in hindsight what would have made me happier with the result, and now what needs to be changed. (P1)

Overall, although micro and macro aspects of performance were at the core of physicians' responses, it was difficult for them to clearly delineate where performance started and ended

given the varied tasks they had to perform on a daily basis and the formal and informal goals they set for themselves. Furthermore, similar cognitive processes (e.g., self-reflection) were reportedly used across all phases of self-regulation and it was difficult for physicians to pinpoint where and exactly when these were implemented.

Self-reflection phase. For the self-reflection phase (i.e., evaluation after performance), the physicians discussed self-evaluation, which included comparing their performance with their set goals and making attributions to explain their performance. They also shared sub-processes related to self-reactions such as creating incentives, deriving self-satisfaction, and making adaptive or defensive inferences for future self-regulatory attempts.

Self-judgment. In general, the majority of the physicians reported being confident in their capacity to evaluate themselves and they identified self-awareness as a key factor in this process. For instance, being aware of how their actions affected outcomes allowed them to see and explain what worked and what did not work and adjust for the future:

It's [important to] reflect back and see what worked and what didn't ... If I did well on something at work, I look back at what I did to succeed in that context, as well as other times when I did not do well. Both pieces of information are important. The next time a similar situation arises, I can respond in the same (or different) way. For instance, last time I did well on an assessment, I reflected back and [attributed it to me] reading-up more. (P3)

Several of the physicians evaluated themselves by comparing themselves to not only their own standards but also other social models in their performance environment: "... [Social modeling] is a big part of medicine ... I like bringing in different aspects of what different people do to self-regulate ... one model may do a certain procedure well, while another may

have a good balance, keeps up on his education, or sets up his clinics or practices in a way that I want to emulate ...” (P3).

Causal attributions. Most of the physicians felt that success or failure with regards to goal achievement was most often attributable to a combination of factors, including one’s level of effort (e.g. how many resources they invested), skill level (e.g., medical tasks, experience), and the degree of perceived control over external factors (e.g., duty schedule, patient expectations):

Life isn’t always something I can control ... however, what I can affect is the amount of effort I put into the work I do, and put all controllable elements into my favour. For example, in placement interviews, who is interviewing you? Do they like you? You can’t control that, but you can control how you prepare. ... If something does not work, I think about whether the result was due to something I could have done differently. Then I [implement] what I learned. In the end, if I know I put in my best effort into something and it still didn’t work, I am able to accept that [and move on]. (P9)

Although social and environmental factors were often beyond their control, most of the physicians emphasized the importance of focusing on elements of their behavior and circumstances they could control when making attributions.

Self-reaction. Another sub-process within the self-reflection phase is that of self-reaction. Many of the physicians agreed that a sense of satisfaction with respect to goal attainment was related to the creation of incentives. Although highly individualized, the incentives could be divided into two general categories, that is, material (e.g., buying a new book, shoes, electronics) and non-material (e.g., taking time for themselves, travel). Interestingly, a few of the physicians identified goal attainment, in and of itself, as an intrinsic motivator and source of satisfaction.

Overall, there was general consensus that one's level of satisfaction with respect to goal attainment is a predictor of one's adaptive or defensive inferences and future efforts:

If I am doing well in something, I tend to want to put more effort into it down the road. If I am not doing so well in, or not enjoying, another area of my life, I tend to avoid it or at least not invest my time or effort to get better ... (P3)

In sum, the aforementioned processes and sub-processes reflect how the physicians experienced the phases of self-regulation, as described by Zimmerman (2000). They provide a contextual landscape for an inductive exploration of the role they perceived their capacity to self-regulate to play in their well-being, as well as what enhances and inhibits this capacity.

The Role of Self-Regulation Capacity in Physician Well-Being

The physicians involved in the qualitative phase of the study perceived their self-regulation capacity to play different roles in their well-being. First, they observed that it facilitates mindfulness, that is, it provides them with an awareness of how they are affected by their medical environment. It also allows them to be resilient and thus adapt in the face of adversity. Effective self-regulation also helps them to maintain balance between their personal and professional life. Finally, the physicians reported that it protects them from adverse outcomes such as burnout.

In general, the majority of the physicians felt that their personal wellness was often linked to how effectively they were able to self-regulate:

For me self-regulation impacts my well-being. ... I have to be comfortable with what I am doing – my thoughts and actions – and if I am not, I don't have that sense of wellness. I am not going to feel satisfied with my everyday life. (P3)

Several of the physicians perceived a reciprocal relationship between their self-regulation capacity and well-being, as opposed to one that is strictly linear:

If you don't see yourself as being able to self-regulate very well it can bring down your well-being. However, it's also a vicious cycle. ... Your level of well-being can influence the quality of that self-regulation. (P1)

Although high self-regulation capacity was reportedly instrumental in allowing them to achieve and maintain a desired sense of well-being, not experiencing well-being (e.g., due to a high degree of emotional stress) could interfere with their capacity to self-regulate. Essentially, self-regulation capacity and well-being were viewed as being part of a facilitative or debilitative feedback loop.

In terms of more specific themes such as mindfulness, the physicians noted that with high demands being placed upon them, their capacity to be self-aware allowed them to be mindful of how their well-being was affected by their medical environment. This kept them in tune with areas requiring adjustments and/or improvements and prompted them to enact specific self-regulation strategies:

Gaining insight into how you are doing, whether or not you can change things up, can [make a difference]. Everyone has a bad day, but if you are having a few in a row, that ability to be aware and figure out what is different and what you can do to improve how you are feeling is an important skill ... For instance, when I have high anxiety, I can [effectively] self-regulate by assessing what is different and what I can do to change the situation. I seek out help, whether it be from [strategies such as] art therapy, massage, a date night, or discussing the issue with others ... [Through effective] self-regulation, I can also proactively decide if a future task is something that I think will challenge me and

I would enjoy, as well as whether I have a time slot that I can dedicate to it, or something it can take the place of. (P5)

Overall, the physicians noted that being self-aware helped them to maintain a pulse on how their work and other social environments affect them on a daily basis:

Self-regulation helps me make sure I am keeping my well-being at an acceptable level – that I take care of myself. ... I think it works in the background, making sure I don't push myself too much ... it helps me keep tabs on myself, like a fuel gauge in a car – if it runs low, such as feeling too stressed, then I know I have to rest ... it displays where I am in relation to where I can safely manage everything in my life. This is very important [because] you work best when you feel well. If you are tired or stressed, or under too much pressure, you will not work well. (P6)

For these physicians, their capacity to effectively self-regulate also facilitated resilience, allowing them to adapt and successfully respond to barriers (e.g., lack of sleep, difficult patients). It also promoted the proactive generation of challenges for personal growth, which is an important component of well-being. Following is a citation highlighting the importance of adaptability:

I think it beats you down a lot ... I know that it's hard to get a lot of sleep, and things like that can negatively affect your self-regulation and well-being to a large degree. I think it takes a conscious effort to adapt yourself ... there is no normal in medicine, so one's ability to accept that and adapt to that reality is what makes the difference in how it will ultimately affect your well-being. Again, a lot of it all comes back to sleep deprivation, and there is a lot of that in residency. (P11)

The physicians also suggested that their self-regulation capacity allowed them to maintain a sense of balance in their hectic, demanding profession: “It becomes more and more important as more things you need to balance or manage arise ... it is an important component to well-being” (P9). It also helped them to sustain positive relationships in their work and home environment. The following citation summarizes the significance of managing relations in the workplace:

[Self-regulation] helps in terms of being able to work with others [in medicine]. Not everyone is going to get along with you and there are going to be conflicts. How I interpret the fact that there is this conflict and [how I respond to] it is quite important ... how I self-regulate affects how I feel. (P6)

Self-regulation not only affected the physicians' ability to fulfill tasks at work but also at home, which was perceived to have an impact on their well-being:

I think my well-being at work, in terms of how I am able to work towards my goals, and being able to come home in a mood that I am wanting to have a balanced life, is affected by the relationships that I have at work, and so how I self-regulate affects that. Then, at home, I think it is like if I am laying on the couch and wanting to go to the gym, and then feeling better when I am able to go do that, I think that ability to self-regulate and do that – get off the couch – also affects how I feel overall in terms of other things that I want to do. (P9)

Finally, the physicians felt that effective self-regulation served as a protective factor from adverse outcomes that physicians commonly face: “... You need to be able to be a good self-regulator, or you will end up burnt out, or maybe even get yourself into a bad situation

professionally” (P7). They all felt that when they were able to maintain an adequate level of well-being through effective self-regulation, this contributed to better performance in medicine:

Wherever your well-being is, at any given time, it can be affected by what you are able to control ... things are always happening to you, good and bad, and when those things happen you need to be able to [manage yourself]. As a physician, in that sense, you always have to be on top of your game in order to help your patients. Otherwise, you can't be an effective doctor. (P8)

In sum, based on the results of this section, it appears that the physicians' capacity to effectively manage their thoughts, feelings, and actions within their work and home environments plays a role in their well-being. In the following section, the physicians' perceptions regarding what enhances and inhibits their capacity to self-regulate are discussed.

What Enhances and Inhibits Self-Regulation Capacity

Although the factors that enhanced or limited physicians' capacity to self-regulate varied across individuals, some common ones emerged. With regards to what inhibits self-regulation capacity, a lack of autonomy in the medical environment, fatigue, excessive demands, and deficiencies in personal skills (e.g., self-awareness, adaptability) were identified. Factors that were perceived to enhance self-regulation included the development of personal skills (e.g., self-regulation), positive self-evaluations (e.g., satisfaction with clinical performance), experience (e.g., years of practice), conscious effort/practice (e.g., working on self-regulation skills), and self-awareness (e.g., how they are affected by their medical environment).

With respect to what the physicians felt inhibited their self-regulation capacity, a lack of autonomy (e.g., often stemming from a lack of personal time and/or sleep) was particularly relevant for the resident physicians as well as physicians who did not work in a private clinic

setting where they might have had more control over their personal schedule: "... The long work hours are an issue ... You don't often have much control over your schedule. You can't commit to anything else, or anyone else because you can never know when you will be able to leave work." (P6)

There was general consensus among the physicians that feeling exhausted was symptomatic of sub-par self-regulation capacity, which interfered with their ability to balance their personal and professional life:

In both my medical and non-medical life, [my self-regulation is] is low ... I am tired, struggling with the balance between things. When I am burning the candle at both ends it makes me less likely to self-regulate and more likely to be apathetic. I should self-regulate more effectively than I do, but it is one of the first things to show a crack in my armour. (P4)

On another level, taking on too many responsibilities due to demands and not investing enough effort into developing personal skills to remain aware and be able to adapt were perceived to inhibit self-regulation: "I'm trying to change it, and I am trying to accept the fact that I can change it. ... Self-regulation I feel is a skill, and it's something that I know can be improved upon – but it's also something that I don't know yet how hard it will be to improve" (P1). Conversely, the physicians saw engaging in the development of personal skills as contributing to their self-regulation capacity.

With regards to other facilitating factors, some physicians shared that positive self-evaluations contributed to their motivation and satisfaction to sustain self-regulation:

How I evaluate myself at the end of the day is going to affect my motivation to continue to work towards my goals. ... if I am happy with how I am acting or behaving, how I am

directing myself ... When I have [positive self-evaluations] if I am not on the right path ... I can redirect myself. (P3)

While the physicians recognized that their level of experience affected their self-regulation capacity, they also emphasized that practice was key, "Anyone can improve his or her self-regulation. It's a skill that can be built on, be learned. It's a process ... you just have to keep working on it ..." (P12). Additional factors emerged such as self-awareness: "... [It is important to] be able to observe what's going on around me, with my thoughts, feelings, or actions. If I see I need to make changes, if something wasn't working out well, I can take steps to address them." (P7). Many viewed self-awareness as an important embedded self-regulation sub-process that could be developed over time through conscious effort. As such, having acute self-awareness was associated with effective self-regulation for many of the physicians.

In sum, the results presented in this supplemental section give insight into the physicians' experiences of self-regulation based on the phases, processes and sub-processes postulated by Zimmerman (2000). They also demonstrate that physicians did perceive their self-regulation capacity to play a role in their well-being. In particular, they observed a reciprocal relationship between these two variables. Furthermore, it was clear when they discussed factors they perceived to enhance and inhibit their self-regulation capacity that the latter was dynamic and fluctuated based on factors such as autonomy, fatigue, demands, personal skills, positive self-evaluations, experience, effort/practice, and self-awareness. These factors will be contrasted with those perceived to impact their well-being in the general discussion section.

PART III

General Discussion

This section is organized into several sub-sections. First, the purpose of the mixed-methods study and research questions stemming from the feature articles and supplemental results section are revisited. Second, a composite analysis of the entire dataset (i.e., quantitative and qualitative data from Phases 1 and 2) is provided, which represents the final point of convergence in the participant selection model variation of the sequential explanatory design (Creswell & Plano-Clark, 2007). Next, key contributions to knowledge emerging from this research are discussed, including theoretical, methodological, and practical implications, as well as limitations and areas for future research. Finally, concluding remarks are presented.

Purpose and Research Questions Revisited

The overarching purpose of this two-phase, mixed-methods study was to investigate the well-being and self-regulation capacity of physicians. Appendix K summarizes the research questions addressed in each of the phases, articles, and supplemental results section. The quantitative phase (Phase 1) served to give insight into the physicians' levels of psychological and affective well-being, and self-regulation capacity. Furthermore, relationships between these variables and the influence of status (physicians versus resident physicians) were explored. For the qualitative phase (Phase 2), questions centered around the physicians' experiences of psychological well-being and self-regulation. The role physicians perceived their self-regulation capacity to play in their well-being was examined, as well as factors enhancing and inhibiting their well-being and self-regulation capacity.

Composite Analysis

The following composite analysis is a “way of describing how the findings from different methodological approaches can be integrated in a manner that respects their unique characteristics, and thus exploits their potential to yield complementary insights. It recognizes that the analysis is composed of independent parts, but that the whole is greater than the sum of these parts” (Yardley & Bishop, 2008, p. 362).

Physicians' levels and experiences of psychological and affective well-being, and self-regulation capacity. In this section, the physicians' levels of psychological and affective well-being and self-regulation capacity (Phase 1) are contrasted with their experiences of psychological well-being and self-regulation (Phase 2). One of the strengths of a mixed methods design is the triangulation of data. The complementarity of the findings from each phase of this study will be brought to light.

Psychological well-being. As discussed in Feature Article 1, the physicians reported moderately high to high levels of psychological well-being based on their SPWB scores obtained in Phase 1. This was somewhat surprising as much of the literature suggests that physicians struggle to maintain an adequate level of well-being (Cohen et al., 2014; Shanafelt et al., 2003; Wallace et al., 2009). An in-depth exploration of each dimension of psychological well-being using qualitative interviews in Phase 2 helped to corroborate and contextualize these results. For instance, the physicians scored highest on personal growth and purpose in life in Phase 1 – the same two dimensions for which the physicians unanimously reported high functioning in Phase 2. Concerning personal growth, the physicians highly valued it and considered it as an intrinsic part of medicine. There was a belief that being a lifelong learner was an important quality of being an effective physician, and some described this learning as a renewable source of

motivation. These results suggest that ongoing professional development is a crucial part of well-being and medicine, which supports the medical literature (Violato & Lockyer 2006). From a practical perspective, the findings also emphasize the potential value in helping physicians to embrace new situations and continuously engage in learning that promotes professional competence (Mann & Gelula, 2003).

As for purpose in life, findings show that the physicians had a sense of direction and carried out the plans they set for themselves in both personal (e.g., be the best family member they can be) and professional (e.g., make a difference in their patients' life) contexts. As postulated by Ryff and Keyes (1995), their sense of purpose, like personal growth, served as a powerful motivator and fueled their desire to make meaningful contributions. As such, these results indicate that helping physicians to become aware of, or reconnect with, what is meaningful in their life and to establish effective plans for the future could potentially enhance their overall wellness and offer protection from adverse outcomes inherent in the medical profession (Krasner et al., 2009).

Other noteworthy dimensions include autonomy and environmental mastery as the physicians scored lower on these scales relative to the other dimensions. For autonomy, a potential explanation for the physicians' relatively moderate rather than high levels in Phase 1 could be that the considerable demands and pressure they face led them to perceive to have less control over their environment. As highlighted in the interviews in Phase 2, the physicians reported both high and low functioning with regards to autonomy, which corroborates their moderate scores. For instance, among those physicians who reported high functioning, there was a sense of control over behaviours and a focus on internal (controllable) as opposed to external (uncontrollable) factors. Notwithstanding functioning, the physicians also noted the importance

of considering both internal (e.g., personal/self) and external expectations (e.g., those imposed by the profession), with an emphasis on internal ones. Studies have shown that there is a link between physicians' distress or ill health and their perceptions of high work demands and expectations (Arnetz, 2001; Wallace et al., 2009). Although there were no significant differences in autonomy and other dimensions of psychological well-being between physicians and resident physicians (see Feature Article 1), many physicians reported in Phase 2 that their autonomy tended to be lower during medical training and residency. According to the literature, residents must quickly learn how to navigate high demands and low autonomy (Biaggi, Peter, & Ulich, 2003; Thomas, 2004). As such, one could argue that it would be logical to help physicians address autonomy-related issues at the onset of their medical training. For example, learning to shift their focus from external to more internal demands and expectations could help contribute to their overall sense of autonomy and well-being.

With regards to environmental mastery (i.e., capacity to manage/balance day-to-day personal and professional tasks), it was discussed in Feature Article 1 that it is somewhat surprising that despite the years of intensive medical training that physicians undergo, they rated environmental mastery as the lowest dimension. However, the qualitative data from Phase 2 demonstrated that while many of the physicians did perceive to possess a general sense of mastery, which supports their high scores on the SPWB in Phase 1, they felt that maintaining balance on a long-term basis was a considerable challenge. Indeed, Solberg et al. (2012) stated that physicians require help to achieve a realistic and attainable work-life balance. Overall, work-life balance emerged as one of the most prevalent themes in the qualitative phase, which is underscored in the physician health and well-being literature (Wansbrough, 2003). This theme

was particularly addressed in Feature Article 3 and the Supplemental Results section and will be revisited in this discussion.

In addition to the aforementioned dimensions, other important elements emerged from Phase 2 that further contribute to our understanding of physician well-being. For instance, we learned that the physicians could experience each of the dimensions differently in different areas of their life (e.g., personal and professional), and their experiences could also fluctuate over time. For example, the physicians scored high on both the dimensions of self-acceptance and positive relations with others in Phase 1, and although the qualitative findings largely corroborated this, it was also clear that their high and low functioning experiences were often contextual (e.g., personal versus professional life). For instance, some physicians had high quality relations with those in their medical environment, however, they struggled with relationships at home. As such, it is reasonable to assert that contextual/situational and temporal elements should be taken into account when assessing physicians' levels and experiences of psychological well-being.

Overall, the quantitative and qualitative data concerning physicians' psychological well-being were consistent. However, in developing a more comprehensive conceptualization of physicians' psychological well-being, the findings from the more in-depth qualitative data suggest that Ryff and Keyes' (1995) definitions and measure of the dimensions of psychological well-being may require further refinement, particularly with respect to temporal (e.g., how they change over time) and contextual (e.g., differences between personal versus professional life) elements.

Affective well-being. With respect to affective well-being, the physicians reported moderate levels of both positive and negative affect (see Feature Article 1). While these findings are consistent with data from the general population (e.g., Foster et al. 2008), they do not support

previous research suggesting that there is a high prevalence of emotional distress among physicians (Ro et al. 2007). However, since the present study is the first known one to assess the affective well-being of physicians using the PANAS, more research is warranted to confirm these results. It is important to develop a comprehensive understanding of the positive and negative affect levels of physicians, as there are potentially detrimental consequences (e.g., burnout, compromised patient care) if physicians experience chronic distress and emotionally disconnect themselves from their work (Meldrum 2010; Tyssen, 2007). Furthermore, there is a need to examine the qualitative experiences of affective well-being of physicians as this was not done in Phase 2 of the current study given the in-depth examination of the physicians' experiences of psychological well-being and self-regulation.

From a methodological perspective, Ryff and Keyes (1995) noted the implicit role that emotions (e.g., positive and negative affect) play in psychological well-being. However, the SPWB only indirectly addresses affect within the six scales, which is why the PANAS was included as a separate, secondary measure in this research. Unless Ryff and Keyes' scales are refined to more explicitly address emotions, it would be valuable to continue assessing affective well-being as a separate construct in order to maximize our understanding of physician well-being. Perhaps a measure other than the PANAS that targets a longer temporal period would provide a more representative view of physicians' affect. In its current form, the PANAS assesses well-being only over the "last few days" (Watson et al., 1988). In comparison, no temporal period is specified when rating items from the SPWB, however, some items include time-related words such as "sometimes", "in general", or "often".

Self-regulation capacity. The quantitative data from Phase 1 showed that the majority of physicians possessed moderate to high levels of self-regulation capacity. As discussed in Feature

Article 1, this suggests that physicians report to be able to effectively manage themselves in their dynamic and demanding medical environment by enacting a network of processes such as goal setting, planning, self-monitoring, and self-evaluation (Bandura 1991; Zimmerman 2000). This also supports the findings of Gagnon and Durand-Bush (2012) who examined the self-regulation capacity of physicians and medical students using the same questionnaire and found similar results.

The physicians' qualitative experiences of self-regulation explored in Phase 2 help to explain their moderate to high scores on the SSRQ obtained in Phase 1. As presented in the supplemental results section, several themes pertaining to the forethought or preparation phase of self-regulation emerged (Zimmerman, 2000). The physicians identified multiple goals across personal and professional areas of their life, and they emphasized setting process goals. Their goals and expectations were generated and prioritized based on a combination of internal (e.g., personal experiences, thoughts, and feelings) and external sources (e.g., preceptors, colleagues). These results are congruent with those pertaining to the physicians' experiences of psychological well-being discussed in Feature Article 3, whereby the importance of both personal and professional contexts were highlighted. The physicians also underscored the significance of conscious strategic planning, as well as related processes such as self-awareness, organization, and self-reflection. These findings support studies on physician well-being in which similar self-management skills were promoted (Eckleberry-Hunt et al., 2009; Novack et al., 1997). The physicians' perception of a link between their self-efficacy, expectations towards goal-attainment and their level of interest in their goals (Bandura, 1986; Vancouver, 2000) also resonates with Zimmerman's SCM of self-regulation (2000).

With respect to the performance phase of self-regulation, the physicians demonstrated how they were able to implement task strategies, engage in self-instruction, focus their attention on goal attainment (i.e., self-control), as well as track their efforts (i.e., self-observation) using self-recording strategies (e.g., note-taking and meta-cognitive monitoring). This further supports their moderate to high scores on the SSRQ. Since physicians undergo years of intense training, often in fast-paced performance environments, and face consistently high demands throughout their career (Biaggi et al., 2003), it is not surprising that the physicians described effective self-control and self-observation strategies. However, given the voluntary participation of the physicians in this study, it is possible that those who were already effective performers and self-regulators were more inclined to take part compared to those who were not.

Finally, with respect to the self-reflection phase of self-regulation, the physicians shared several sub-processes that help to shed light on their moderate to high self-regulation capacity. The physicians were able to effectively evaluate themselves and past performances to see what worked and what did not work. In turn, this allowed them to adjust in order to enhance future performances. These findings support past research in which the importance of self-reflection and self-awareness were highlighted and positively linked to work-life balance (Novack et al., 1997), meaningful work (Epstein, 1999), reduced levels of burnout (Krasner et al., 2009), and personal and professional development (Kern et al., 2001) among physicians. They also help to substantiate calls to develop systems that enable physicians to look critically at their own practices (Violato & Lockyer, 2006).

As for the more specific sub-process of self-judgment, the physicians in this study evaluated their performance based on a combination of internal (e.g., level of effort, skill-set, sense of control) and external standards (e.g., those provided by models within their work

environment such as colleagues). This supports Simon and Durand-Bush's (2009) findings with medical students and reinforces how social modeling is an important aspect of medicine (Eckleberry-Hunt et al., 2009). Given the positive association between self-regulation capacity and autonomy discussed in Feature Article 2, it was not surprising to see that the physicians paid attention to their sense of control when evaluating their performances. This resonates with Ryff and Keyes' (1995) view of autonomy, which is one's ability to evaluate oneself based on personal standards and regulate behavior from within. Since low autonomy has been connected to several adverse outcomes in physicians, such as burnout (Arnetz, 2001) and reduced work-life balance (Wansbrough, 2003), the current findings may have important implications for both the individual physician (e.g., recognizing the importance of personal autonomy), and medical institutions/organizations (e.g., considering personal autonomy when developing professional policies and procedures for physicians).

In sum, the results of Phases 1 and 2 were congruent and give insight into the self-regulation capacity of this sample of physicians. They provide rich data with respect to how these physicians experienced various self-regulation processes and sub-processes within their personal and medical environment. The physicians' discourse regarding factors that enhanced and inhibited their self-regulation capacity suggests that the latter is dynamic and can fluctuate over time and across situations. These factors as well as the physicians' perceived association between their self-regulation capacity and well-being will be addressed in a subsequent section.

Differences in psychological and affective well-being between physicians and resident physicians with high and low self-regulation capacity. Another question we sought to answer in this study was the following: Are there significant differences in psychological and affective well-being between physicians and residents with high and low self-regulation

capacity? First, results confirmed the hypothesis that high self-regulating physicians and resident physicians would have higher levels of psychological well-being and positive affect compared to those with lower levels. These findings are consistent with that of Gagnon and Durand-Bush (2012) as well as the literature on self-regulation. According to several researchers, effective self-regulation leads to a range of positive well-being outcomes (Baumeister et al., 2006; Sanders & Mazzucchelli, 2012). Furthermore, individuals with higher levels of well-being tend to adopt more positive self-care behaviours and exhibit fewer maladaptive behaviours (Diener & Ryan, 2009; Zimmerman, 2000). Although the physicians and resident physicians in this study with higher self-regulation capacity did not have lower negative affect than their low self-regulating counterparts, the significant finding regarding their positive affect suggests that emotions should be considered in the self-regulation process (Gross & Thompson, 2007). This is particularly relevant since emotions were found to contribute to both successes and failures of self-regulation as well as mental and physical health (Vohs & Baumeister, 2004).

Results did not support the hypothesis that physicians would have significantly higher levels of psychological and affective well-being than resident physicians (see Feature Article 1). However, there was tentative support for an interaction between self-regulation capacity and status (i.e., physician versus resident physician) for the self-acceptance dimension of psychological well-being. In other words, high self-regulating resident physicians possessed significantly higher levels of self-acceptance than their lower self-regulating counterparts, while high self-regulating physicians had only slightly higher levels of self-acceptance than lower self-regulating physicians. More research is required to substantiate this interaction.

Generally speaking, the lack of overall differences between physicians and resident physicians supports some findings in the literature (Bragard et al., 2010; Michels et al., 2003).

The qualitative results from Phase 2 also support this as very few themes emerged that would point to differences in not only well-being but also self-regulation capacity between physicians and resident physicians. The only notable exception pertained to the autonomy dimension of psychological well-being whereby both physicians and resident physicians reported that autonomy tended to be lower during medical training and residency. This corroborates research showing that residents often have heavier workloads and less autonomy compared to more senior physicians (Aalsland, Rovik, & Wiers-Jenssen, 2008; Biaggi et al., 2003; Thomas, 2004). As previously mentioned, the dimension of autonomy should be given particular attention in future research given its importance in the medical domain.

The role of self-regulation capacity in physician well-being. As presented in the previous section and in Feature Articles 1 and 2, there was a significant positive relationship between physicians' self-regulation capacity and well-being. The quantitative results showed that high self-regulating physicians and resident physicians had higher levels of psychological well-being and positive affect compared to their lower self-regulating counterparts (Article 1). Physicians' self-regulation capacity also significantly predicted their levels of psychological well-being (Article 2). Consistent with previous research in non-medical contexts, these findings support the link between self-regulation capacity and well-being (Sanders & Mazzucchelli, 2012), and suggest that self-regulation capacity may be an important skill for physicians to nurture in order to meet the high demands of the profession (Gagnon & Durand-Bush, 2012).

The data from Phase 2 provided a more in-depth perspective on what role self-regulation capacity may play in physician well-being. First, it was clear from the physicians' reports that self-regulation involved an individualized network of processes that could vary across time and contexts (e.g., work, home), which supports the literature. Although concepts similar to self-

regulation, such as self-management and resilience, have been shown to differ greatly between individuals (Arnetz, 2001), individual variation and contextual differences in self-regulation (as described in the present research) have not been explored in the medical context. Future research should compare how physicians self-regulate within both their personal and professional life, and explore the potential implications of this.

The most common roles that self-regulation was perceived by the physicians to play in their well-being were the promotion of self-awareness, the facilitation of resilience, and the maintenance of a work-life balance. Self-awareness is an essential component of self-regulation and its importance in the medical profession has been well documented (Eckleberry-Hunt et al., 2009; Krasner et al., 2009). The capacity to be self-aware may allow physicians to be mindful of how their well-being is affecting their performance and vice versa. It may also help them stay in tune with areas in their personal life that require adjustments or improvements. The concept of mindfulness, which closely aligns with self-awareness, has also become a key area of interest in the physician health literature given its association with well-being (Hassed, de Lisle, Sullivan, & Pier 2008).

Resilience, which reflects an individual's capacity to respond to setbacks in a healthy and adaptive manner, persist in the face of obstacles, and achieve personal goals (Epstein & Krasner, 2013), has also been positively underlined in the medical literature (Arnetz, 2001; Gautam, 2009). It resonates with characteristics of effective self-regulation (Zimmerman, 2000) and has been identified as a central element of physician well-being (Zwack & Schweitzer, 2013). The physicians in the current study suggested that being an effective self-regulator allowed them to respond to barriers in an effective manner. For instance, by engaging in self-observation (Zimmerman, 2000) and self-monitoring (Bandura, 1991), they were aware of inhibiting

thoughts and emotions that negatively affected their performance during clinical practice, which in turn allowed them to make adjustments for the future. According to the American Psychological Association (2014), resilience allows individuals to "bounce back" from difficult experiences and further refine behaviors, thoughts and actions. Resilient individuals also respond to obstacles in ways that personal goals are achieved at minimal psychological cost (Epstein & Krasner, 2013), and they are more inclined to balance their work and personal life (Jensen, Trollope-Kumar, Waters, & Everson, 2008).

Interestingly, in addition to facilitating resilience, the physicians in this study perceived self-regulation to contribute to their capacity to maintain a sense of personal and professional balance, which is an important element of the environmental mastery dimension of psychological well-being. These results are promising given that concerns surrounding work-life balance have become pervasive in physician wellness circles (Dunn et al., 2007). Although many have advocated that physician wellness should include thriving in both personal and professional contexts (Shanafelt et al., 2003), results from the 2008 Canadian Physician Health Survey revealed that nearly 25% of physicians reported poor work-life balance (Compton & Frank, 2011). Maintaining a sense of balance between one's professional and personal life appears to be critical and linked to more than one dimension of psychological well-being (see Feature Article 3). Since physicians often operate under conditions in which they have little control or flexibility in certain areas of their work (Thomas, 2004), developing skills such as goal setting, strategic planning, attention focusing, and meta-cognitive monitoring (Zimmerman, 2000) may be one way to help them manage their complex responsibilities. Self-regulation may also help physicians to stay mindful of and prioritize what is important in their personal life in relation to their professional life. More research is required to shed light on this prevalent "balance" theme

that emerged from this study. Overall, both the qualitative and quantitative results of this research support Vohs and Baumeister's (2004) argument that "the ability to self-regulate is an integral component of mental and physical well-being" (p. 213).

What enhances and what inhibits self-regulation capacity and well-being. The physicians in this study not only reported that their self-regulation capacity impacted their well-being, they also discussed what inhibited and enhanced their self-regulation capacity and well-being. Interestingly, in doing so, they inadvertently raised more links. With respect to self-regulation capacity, they indicated that a low sense of autonomy, which is a dimension of psychological well-being on which they scored low compared to the other dimensions, was one factor that inhibited it. Autonomy, which has emerged as another noteworthy variable in this research should be further examined in future research. A lack of self-awareness and an inability to prioritize were also perceived by the physicians to inhibit their capacity to self-regulate. This is logical given that self-awareness and strategic planning are core elements of the self-regulation process (Zimmerman, 2000), thus a lack in these sub-processes would undoubtedly affect self-regulation. Feelings of exhaustion/fatigue were also raised, which were not surprising as excessive workloads and a lack of rest are commonly reported by physicians and associated with adverse outcomes (Arnetz, 2001; Wallace & Lemaire, 2007).

The physicians interestingly identified active skill development (e.g., in self-regulation) as both a factor that inhibited (i.e., when insufficient attention was devoted to this) and enhanced their self-regulation capacity. Experience (e.g., years of practice) was another enhancing factor. Although experience could likely contribute to their capacity, Schunk and Zimmerman (2003) have cautioned that "self-regulation does not develop automatically with maturation, nor is it acquired passively from the environment. Systematic interventions assist the development and

acquisition of self-regulatory skills ” (p. 61). Whether self-regulation skills were consciously or unconsciously developed, some physicians in Phase 2 perceived their self-regulation capacity to evolve over time. According to the literature, however, it would appear that in order to maximize the development of this competency, physicians should engage in systematic initiatives.

With respect to factors perceived by the physicians to inhibit and enhance their well-being, the inability to balance their personal and professional life, and medical culture were reported as central barriers. Once again, the capacity to cultivate and maintain personal and professional balance was raised by the physicians. This helps to corroborate why maintaining balance has been described as one of the most essential skills a physician can develop (Fischman, Shutte, & Solomon, 1999). Furthermore, given that challenges in the medical profession have been linked to organizational antecedents (Cohen et al., 2014; Tyssen, 2007), the physicians’ concession that medical culture can be a barrier to their well-being is important. Indeed, a prevailing stigma attached to physician wellness persists within the profession, and remains a serious obstacle (Gautam, 2009). Furthermore, although improved organizational efficiency has been shown to predict positive changes in psychological well-being, organizational methods to enhance efficiency are often applied uncritically to medical practice in order to promote higher medical output with fewer resources (Arnetz, 2001). This points to a growing imperative for physicians to focus on positive and controllable aspects of their work (Gautam, 2009), as well as factors that enhance their health and well-being.

Positive social modeling and maintaining a positive attitude were perceived by the physicians in this study to enhance well-being. Behaviour modeling is an important part of effective self-regulation (Zimmerman, 2000) thus high self-regulating physicians and those who are “well” should realize that their actions may serve as a template for others, and actively reach

out to them in order to promote better self-care (Brazeau, 2010). Finally, maintaining a positive attitude, which can be linked to elements of the self-acceptance dimension of psychological well-being (Ryff & Keyes, 1995), may help physicians thrive and also avoid adverse wellness outcomes. For instance, having a generally healthy and positive outlook has been identified as a strategy to help prevent physician burnout (Meldrum, 2010; Spickard et al., 2002).

In sum, the physicians were able to identify a multitude of factors that inhibited and enhanced their self-regulation capacity and well-being. This marks an important step in targeting specific factors that can be either minimized or promoted in order to help physicians take ownership of their work and personal life, and reach and maintain adequate levels of wellness.

Contributions to Knowledge, Implications, Limitations, and Future Research

It is anticipated that this research will make a significant contribution to knowledge from a theoretical, methodological, and practical perspective. It will also serve as a springboard for future research and practice. From a theoretical perspective, the results of this thesis contribute to the physician health and well-being literature in several ways. It can be argued that this research represents one of the more robust studies in terms of the breadth and depth of how physician well-being was conceptualized and investigated. It also responds to calls from the field to study physician well-being using a positive psychology approach. The adoption of this approach in combination with Ryff and Keyes' (1995) multidimensional framework of psychological well-being allowed us to focus on positive functioning as opposed to impairment, the latter of which was the emphasis in many previous studies in this area. Theories that are specific to physician well-being are scarce and this research, particularly the qualitative results presented in Feature Article 3, may begin to inform a well-being framework that resonates with the reality and needs of physicians.

Continuing to build on Ryff and Keyes' (1995) six dimensions of psychological well-being, it would be an important step in future research to pay particular attention to the work-life balance theme that emerged across several dimensions. Specifically, it may be that Ryff and Keyes' framework could be more tailored to physicians' functioning in both their professional and personal environments. The in-depth nature of the qualitative data helped to detect that their perceived level of functioning varied over time and across dimensions between their work and home life. At the moment, Ryff and Keyes' framework, which has mainly been used in quantitative studies, may not be sensitive or sophisticated enough to capture these nuances. It would also be important to determine whether or not elements of affective well-being should be added to this framework to get an exhaustive view of physicians' well-being. The results of this study pertaining to affective well-being were not elaborate enough to put forth more specific recommendations.

This research also fills a gap in the self-regulation literature. While self-regulation has been investigated in many domains and with different populations, very few studies have involved physicians. In particular, results of this research demonstrate that physicians can identify with and experience different processes and sub-processes underlying effective self-regulation. Of importance, they confirm that self-regulation capacity accounted for a significant proportion of individual variation in the physicians' psychological well-being and positive affect. The qualitative data also showed that self-regulation capacity was perceived by the physicians to play an important role in their well-being, and fluctuate across time and contexts based on a variety of factors. While Zimmerman's (2000) SCM of self-regulation was an invaluable framework used to collect and analyze the data, it would be interesting to revise it in order to be able to capture processes and sub-processes relevant to different contexts (e.g., personal and

professional) and the performance phase given the critical nature of physicians' work. More research is warranted before recommendations to adapt the self-regulation model to physicians can be made. Nonetheless, the existence of a relationship between the self-regulation capacity and well-being of physicians is clear and was demonstrated in Gagnon and Durand-Bush's (2012) research as well.

From a methodological perspective, this investigation was the second one in which Ryff and Keyes' (1995) SPWB framework and Zimmerman's (2000) SCM of self-regulation were integrated to examine the relationship between physicians' well-being and self-regulation capacity. Gagnon and Durand-Bush (2012) conducted an initial pilot study and found similar results, which is promising. The extensive empirical support these two frameworks have received in the literature help to establish the robustness of the current study. Furthermore, the comprehensive nature of these frameworks permitted a more in-depth account of the topics under investigation. Interestingly, some similarities were noted between the environmental mastery dimension of psychological well-being in Ryff and Keyes' (1995) framework and the general concept of self-regulation, although environmental mastery is much more narrow in scope based on Ryff and Keyes' definition. More attention should be paid to these variables in future research to examine the extent to which they are both similar and different.

The use of a sequential explanatory mixed methods design (Creswell & Plano-Clark, 2007) in this study was novel and we recommend that this type of design be considered in future research. Although the data were collected and analyzed by the same researcher across both phases, this is perceived to have increased the validity and reliability of the findings. Attempts were made to reduce personal bias by supporting hypotheses with the literature in Phase 1 and remaining blind to the groups from which participants were sampled while conducting and

analyzing the qualitative data in Phase 2. Furthermore, inter-rater reliability was verified and deemed acceptable.

The mixed methods design allowed us to include an exploratory qualitative phase and to purposefully sample physicians with varying levels of psychological well-being and self-regulation capacity. This enabled us to get a more realistic and well-rounded picture of physicians' experiences and functioning. The translation of Ryff and Keyes' (1995) SPWB framework and Zimmerman's (2000) SCM of self-regulation into an in-depth, interview guide for the qualitative phase of this study was unique. It was tedious and paves the way for other qualitative studies so that we can continue to build our understanding of physicians' well-being and self-regulation capacity. It is, however, recommended that additional questions linking psychological well-being and self-regulation capacity be included in future research to more specifically examine the relationship between these two variables. Another recommendation is to qualitatively examine if and how well-being and self-regulation capacity differ based on pre-determined groups of participants with high and low levels.

Another methodological contribution pertains to the SSRQ. This research demonstrated the acceptable factorability and use of the revised, 19-item SSRQ as a single-factor measure of self-regulation capacity with a physician population. Nonetheless, the SSRQ should be employed with other samples of physicians in order to confirm these findings and/or to adapt it to be more context-specific for physicians and generate normative data for this population. Given the complexity and range of processes and sub-processes involved in self-regulation, it is not clear whether or not the use of a single-score (i.e., general self-regulation capacity) would be favored over multiple specific scores generated from a measure that would assess several areas contributing to self-regulation (e.g., self-awareness, goal-setting, strategic planning, attention

focusing, self-monitoring, self-judgment; Zimmerman, 2000). Although there is support for a single-factor of self-regulation capacity, Zimmerman's model consists of multiple phases, processes, and sub-processes thus the creation of a measure that captures each intricate component across a variety of contexts may be of value in order to develop a more specific understanding of the mechanisms at play for physicians. This would help to uncover which processes and sub-processes are specifically contributing to different aspects of physicians' psychological well-being. However, given the existing heavy workloads of physicians, the length of any new or revised measure should be considered and remain feasible. Finally, given that our cross-sectional sample only provided a snapshot of physicians' self-regulation capacity and well-being, it is important that future studies build on these findings by incorporating indicators of positive functioning into more longitudinal and/or experimental designs with larger samples.

The results of this research also have important practical implications. First, they demonstrated that the physicians who effectively managed themselves and their environment had higher psychological well-being and positive affect scores. As such, if physicians struggle in any of the multiple areas of well-being identified in this study, enhancing their capacity to self-regulate may be one way to address these issues. Self-regulation training could be provided through mediums across the physicians' lifecycle, for example, through professional development workshops, seminars, or retreats, and through formal education as soon as students enter medical school. The framework addressing physician well-being (proposed in Feature Article 3) could serve as a guiding component of this future work. Strengthening self-regulation skills using Zimmerman's (2000) SCM could be promising as well. Its focus on optimal functioning and adaptability could possibly help physicians become more resilient to the evolving demands of the medical profession (Remen 2001). The physicians' and resident

physicians' moderate to high levels of self-regulation capacity in this study suggests that they had already developed competency in this area, presumably through their intensive training.

However, self-regulation capacity can fluctuate, particularly during times of duress, thus future research should explore different means to nurture self-regulatory skills in physicians over time and across contexts. It would also be interesting to determine if and how self-regulation capacity varies based on different personality factors deemed important in medical practice (e.g., emotional stability, compassion, patience).

There are also potential practical implications regarding "social responsibility" that emanate from this research - both at the organizational (macro) and individual (micro) level - in order to promote positive, proactive change in physician health and well-being. Although medical organizations/institutions have begun to adopt a more directive role in the promotion of optimal physician well-being (Eckleberry-Hunt et al., 2009; Riley, 2004), organizational restructuring to reduce the demands placed on physicians will take time (Shanafelt, 2009). Positive associations between healthy physicians and a sustainable healthcare system have been demonstrated (Gautam, 2009), yet the stigma surrounding physician well-being remains a significant barrier within the profession (Calnan, Wainwright, Forsythe, Wall, & Almond, 2006; Pitkanen, Hurn, & Kopelman, 2008). If the profession is in part responsible for the impairment of physicians, it seems reasonable to assert that positive profession-led changes could also help reverse this trend. On a macro-level, this would emphasize the importance of commitment across all levels of leadership.

At the micro-level, all physicians can become leaders by living and actively promoting wellness, for themselves and for others (Epstein et al., 2008). As previously mentioned, positive social modeling was an emerging theme in this study, and the need for positive role models in

medicine has been well-documented (Wright et al., 1998). Modeling is important in helping shape the ethics and values, attitudes, and behaviors of medical trainees (Branch et al., 1997). There is an opportunity for medical educators to help physicians-in-training to develop the competencies required to achieve and manage their well-being from the onset of their medical education. This is particularly important since medical students have been shown to adopt similar maladaptive behaviours to those practiced by their supervisors (Wallace et al., 2009). Overall, this research could serve as an impetus for the development of guidelines and interventions for medical learners, physicians engaged in continuing education/professional development, and physicians wanting to optimize their health and well-being.

Conclusions

To purpose of this research was to investigate the well-being and self-regulation capacity of physicians. Following are the main findings that emerged:

- (a) Physicians and resident physicians had moderate to high levels of psychological well-being and self-regulation capacity, as well as moderate levels of positive and negative affect (□hypotheses supported). Contrary to some of the literature showing that physicians are distressed and burnt out, physicians and resident physicians in this study appeared to effectively manage themselves and positively function.
- (b) High self-regulating physicians and resident physicians had higher levels of psychological well-being and positive affect compared to those with lower levels of self-regulation capacity (□hypotheses supported). This confirms previous findings that effective self-management skills can lead to a range of positive well-being outcomes.

- (c) Higher self-regulating physicians and resident physicians did not have lower negative affect than their low self-regulating counterparts (☐hypothesis not supported). This suggests that even though physicians and resident physicians can self-manage, they may still experience some negative affect. This could perhaps be due to the excessive and sometimes conflicting demands they face in their professional and personal life, and the challenge they have of maintaining effective self-regulation in all contexts on a continuous basis.
- (d) Physicians did not have a significantly higher level of psychological well-being and positive affect and a lower level of negative affect than resident physicians (☐hypothesis not supported). This suggests that regardless if physicians are young or more experienced, they can experience positive functioning in the medical profession. There was, however, evidence of an interaction indicating that while high self-regulating resident physicians possessed significantly higher levels of self-acceptance than low-self-regulating resident physicians, high self-regulating physicians had only slightly higher levels of self-acceptance than their low self-regulating colleagues. This may mean that resident physicians who can effectively self-manage may have a more positive attitude toward themselves and past experiences than their less effective counterparts and this may not be as relevant for physicians.
- (e) Self-regulation capacity had a significant positive relationship with, and significantly predicted, all dimensions of psychological well-being (☐hypothesis supported). This suggests that developing effective self-regulation skills may help physicians to achieve and maintain adequate levels of psychological well-being. There was a particularly strong relationship between self-regulation capacity and the dimensions

- of purpose in life and environmental mastery, which suggests that physicians who effectively self-manage may be better able to preserve a sense of purpose and an adequate work-life balance in their daily life.
- (f) Physicians qualitatively reported both high and low functioning experiences of psychological well-being pertaining to self-acceptance, positive relations with others, environmental mastery, and autonomy. However, they reported mainly high functioning experiences for the dimensions of personal growth and purpose in life. Overall, their experiences also varied based on their professional and personal life contexts, with work-life balance emerging as a vital construct.
- (g) Physicians qualitatively reported a range of experiences relating to self-regulation, including those relevant to forethought or preparation (i.e., task analysis, self-motivational beliefs), performance (i.e., self-observation, self-control), and self-reflection (i.e., self-judgment, self-reaction) processes and sub-processes. Their capacity to effectively manage their thoughts, feelings, and actions within their professional and personal life contexts fluctuated and was perceived to play a role in their well-being. Physicians saw their self-regulation capacity as facilitating mindfulness, resilience, balance, and protection from adverse outcomes.
- (h) Physicians perceived some factors to inhibit their well-being. These included the inability to balance their personal and professional life, and the medical profession itself. Conversely, they observed factors that enhanced their well-being and these encompassed positive social modeling and a positive attitude.
- (i) Physicians identified factors that inhibited their self-regulation capacity and these included a lack of autonomy in the medical environment, fatigue, excessive demands,

and deficiencies in personal skills such as self-awareness and adaptability. The factors they deemed to enhance their self-regulation competence were the development of personal skills, positive self-evaluations, experience, effort/practice, and self-awareness.

Overall, it may be concluded that deepening our understanding of physicians' capacity to self-regulate may help uncover ways to help them achieve positive and healthy living. We cannot ignore the fact that physicians face increasing demands and health risks, which illustrate why physician well-being is now an important public health issue with serious societal costs (Devi, 2011; Eckleberry-Hunt et al., 2009). The increasing body of evidence is showing that those who are able to effectively care for themselves are more likely to do a better job of caring for others and are less likely to commit medical errors, all of which are cost-saving for healthcare systems (Epstein & Krasner, 2013). Developing means to help physicians effectively self-regulate in both their professional and personal life appears promising and warrants further investigation.

Following is a quote from Epstein and Krasner (2013), which embodies the ultimate purpose of this research, which was to find ways to help physicians stay healthy:

Patients want physicians who are attentive, rested, present, and caring ... with the resilience to handle stress that may be the result of their own and other patients', devastating illnesses and complex problems. They want physicians who can recognize potential errors before they happen, slow down when they should, seek advice when they are overwhelmed, and respond mindfully rather than react reflexively to challenges. They want physicians who are connected to other physicians – to draw support, advice, and wisdom. (p.3)

Epilogue

Despite the well-documented barriers that physicians face in their profession, I feel there are genuine reasons for optimism. Through my immersion in the physician health and wellness literature, and my more recent experiences in helping launch the Canadian Physician Health Institute, a joint program of the Canadian Medical Association and Canadian Medical Foundation, it is my belief that in time, the medical culture will be represented by a critical mass of physicians who not only recognize the importance of adopting practices that promote optimal well-being in themselves and others, but also develop the necessary skills to do so.

Everyone experiences medical challenges – challenges that are routinely met by physicians like those documented in this research. If healthy doctors really provide better patient care, we truly are all stakeholders in physician health and wellness. In closing, I am reminded of a common phrase in the medical lexicon, an oath taken by every doctor upon their graduation from medical school – “to do no harm”. Perhaps doing no harm begins with taking care of oneself.

PART IV

Statement of Contributions

This section briefly details the contributions of the doctoral candidate (Christopher Simon) to this thesis, as well as those of the other collaborators. Although the candidate is the primary author of the research detailed in this document, there are several individuals who have made notable contributions at various stages. As the candidate's thesis supervisor, and responsible for general oversight, Dr. Natalie Durand-Bush was directly involved in all phases of this research. Building on the candidate's Master's work (which she also supervised), Dr. Durand-Bush was integral to the initial conceptualization of the project, the procurement of ethics approval, the collection and analyses of the data, and the writing, editing, and revisal of all chapters of this thesis. Dr. Durand-Bush is also listed as a second author on each of the Feature Articles presented herein, and will be included as such on any future publications stemming from this data set. Thesis committee members, Dr. Diane St. Marie and Dr. Bradley Young provided input during the early conceptualization and refinement of the project during the thesis proposal phase. They were also periodically consulted for guidance during the data collection and quantitative data analyses phases. Although less formal in nature, the contributions of Dr. Shane Sweet and Dr. Eva Guerin, and Ms. Jamie Collins, Ms. Kylie McNeil, and Mr. Aman Hussain should be noted. Dr. Sweet and Dr. Guerin (recent graduates from the University of Ottawa) provided statistical and editorial advice at several junctures during the analysis of the quantitative data. Ms. Collins and Ms. McNeill, PhD students under the supervision of Dr. Durand-Bush, served as independent coders to establish inter-rater reliability during the qualitative data analysis phase. Mr. Hussain (PhD candidate at the University of Queensland) provided editorial guidance with respect to the organization of qualitative data.

PART V

References and Appendices

This section consists of two sections; first a list of references for sources that are not found in the references lists of the feature articles, and second, the appendices.

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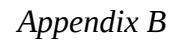
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Appendix A

Ranges of Functioning and Theoretical Foundations of the Six Dimensions of Psychological Well-Being (Adapted from Ryff & Keyes, 1995; Ryff, 2013)

Dimensions	Theoretical Foundation	Range of Functioning
<i>Self-Acceptance</i> Positive evaluations of oneself and one's past life	- Fully functioning person (Rogers, 1961) - Maturity (Allport, 1961)	<i>High</i> Possesses a positive attitude toward the self; acknowledges and accepts multiple aspects of self, including good and bad qualities; feels positive about past life. <i>Low</i> Feels dissatisfied with self, is disappointed with what has occurred in past life, is troubled about certain personal qualities, wishes to be different than what he or she is.
<i>Positive Relations With Others</i> Possession of quality relations with others	- Mental health (Jahoda, 1958) - Will to meaning (Frankl, 1959)	<i>High</i> Has warm, satisfying, trusting relationships with others; is concerned about the welfare of others; capable of strong empathy, affection, and intimacy; understands give and take of human relationships. <i>Low</i> Has few close, trusting relationships with others; finds it difficult to be warm, open, and concerned about others; is isolated and frustrated in interpersonal relationships; not willing to make compromises to sustain important ties with others.
<i>Autonomy</i> Sense of self-determination	- Fully functioning person (Rogers, 1961) - Self-actualization (Maslow, 1968) - Individuation (Jung, 1933)	<i>High</i> Is self-determining and independent, able to resist social pressures to think and act in certain ways, regulates behavior from within, evaluates self by personal standards. <i>Low</i> Is concerned about the expectations and evaluations of others, relies on judgments of others to make important decisions, conforms to social pressures to think and act in certain ways.
<i>Environmental Mastery</i> Capacity to manage effectively one's life and surrounding world	- Will to meaning (Frankl, 1959) - Personal development (Erikson, 1959) - Basic life tendencies (Buhler, 1935)	<i>High</i> Has a sense of mastery and competence in managing the environment, controls complex array of external activities, makes effective use of surrounding opportunities, able to choose or create contexts suitable to personal needs and values. <i>Low</i> Has difficulty managing everyday affairs, feels unable to change or improve surrounding context, is unaware of surrounding opportunities, lacks sense of control over external world.

<i>Purpose in Life</i> Belief that one's life is purposeful and meaningful	• Basic life tendencies (Buhler, 1935) • Executive processes of personality (Neugarten, 1973) • Maturity (Allport, 1961)	<i>High</i> Has goals in life and a sense of directedness, feels there is meaning to present and past life, holds beliefs that give life purpose, has aims and objectives for living. <i>Low</i> Lacks a sense of meaning in life; has few goals or aims, lacks sense of direction; does not see purpose in past life; has no outlooks or beliefs that give life meaning.
<i>Personal Growth</i> Sense of continued growth and development as a person	• Individuation (Jung, 1933) • Mental health (Jahoda, 1958)	<i>High</i> Has a feeling of continued development, sees self as growing and expanding, is open to new experiences, has a sense of realizing his or her potential, sees improvement in self and behavior over time, is changing in ways that reflect more self-knowledge and effectiveness. <i>Low</i> Has a sense of personal stagnation, lacks sense of improvement or expansion over time, feels bored and uninterested with life, feels unable to develop new attitudes or behaviors.



Appendix C

Multi-phase Summary of Sequential Explanatory Design, Participant Selection Model
(Modified from procedures of Ivankova et al., 2006)

Sequence	Procedure	Product
QUANTITATIVE Data Collection	• Four questionnaires • ($n = 132$)	• Numeric data
↓ QUANTITATIVE Data Analysis	• SPSS software v.20 • Data screening • Descriptive statistics • Exploratory factor analysis (SSRQ) • Linear and hierarchical regressions • Between-subject MANOVAs	• Collinearity, sampling adequacy, sphericity, distribution range, internal consistency • Means and standard deviations • Factor loadings (SSRQ) • Variance explained • Multivariate and univariate analyses
↓ Connecting Quantitative & Qualitative Phases	• Participant selection for interviews based on quartile splits of self-regulation capacity and psychological well-being levels • Maximum variation sampling	• 12 interviewees
↓ Qualitative Data Collection	• Individual, in-depth interviews • Interview guide based on self-regulation and psychological well-being frameworks	• Raw textual data
↓ Qualitative Data Analysis	• Inductive and deductive systematic content analyses	• Codes and themes • Representative quotes
↓ Integration of QUANTITATIVE & Qualitative Results	• Composite analysis: Interpretation and explanation of quantitative and qualitative results	• Integrated discussion • Implications • Future research

Appendix D

Recursive Process for Exploratory, Fixed One-Factor Analysis of SSRQ Scores in a Sample of Physicians

Original Item	Step (number of items)					
	1 (31)	2 (25)	3 (23)	4 (21)	5 (20)	6 (19)
	Eigenvalue					
	7.54	6.83	6.56	6.33	6.21	6.04
	Variance Explained (%)					
	24.33	27.30	28.54	30.13	31.03	31.77
	Factor Loadings					
I have a hard time setting goals for myself (16)	.665	.675	.686	.695	.710	.721
I have trouble making plans to help me reach my goals (19)	.630	.660	.682	.691	.708	.715
I have trouble following through with things once I've made up my mind to do something (10)	.589	.623	.648	.659	.665	.658
I put off making decisions (6)	.571	.590	.613	.633	.643	.649
I don't notice the effects of my actions until it's too late (4)	.625	.641	.641	.635	.629	.612
I get easily distracted from my plans (3)	.542	.563	.576	.595	.599	.597
I set goals for myself and keep track of my progress (21)	.521	.520	.537	.551	.577	.593
Most of the time I don't pay attention to what I'm doing (22)	.576	.560	.547	.545	.538	.540
I am able to accomplish goals I set for myself (5)	.500	.511	.521	.529	.535	.537
I have a lot of willpower (17)	.562	.553	.550	.535	.524	.529
I give up quickly (31)	.511	.522	.526	.518	.519	.519
If I make a resolution to change something, I pay a lot of attention to how I'm doing (26)	.539	.532	.526	.511	.506	.510

When I'm trying to change something, I pay a lot of attention to how I'm doing (18)	.513	.508	.497	.490	.493	.505
I tend to keep doing the same thing, even when it doesn't work (23)	.577	.561	.546	.546	.524	.504
Once I have a goal, I can usually plan how to reach it (25)	.499	.503	.495	.484	.481	.490
If I wanted to change, I am confident that I could do it (8)	.498	.486	.490	.491	.488	.490
Often I don't notice what I'm doing until someone calls it to my attention (27)	.512	.510	.494	.497	.488	.479
When it comes to deciding about a change, I feel overwhelmed by the choices (9)	.453	.466	.471	.483	.479	.488
I have trouble making up my mind about things (2)	.416	.430	.452	.479	.477	.471
I don't seem to learn from my mistakes (11)	.461	.469	.468	.461	.444 ^a	
I learn from my mistakes (29)	.450	.436	.406	.378		
I know how I want to be (30)	.415	.401	.381			
As soon as I see a problem or challenge, I start looking for possible solutions (15)	.412	.384				
I can stick to a plan that's working well (12)	.407	.403	.383			
I usually think before I act (28)	.400	.398				
It's hard for me to notice when I've "had enough" (7)	.397					
I have personal standards, and try to live up to them (14)	.394					
I usually keep track of my progress toward my goals (1)	.361					
I can usually find several different possibilities when I want to change something (24)	.361					
I am able to resist temptation (20)	.352					
I usually only have to make a mistake one time in order to learn from it (13)	.331					

Note. Extraction method, principle component analysis. Factor loadings > .40 are in boldface. SSRQ = Short-Form Self-Regulation Questionnaire.

^a Factor loadings adjusted to > .45 because removal of item 11 (.444) increased variance explained.

Appendix E

Conceptual Relevance of the Revised 19-Item SSRQ to the Social-Cognitive Self-Regulation Frameworks Guiding this Study

Item	Self-Regulation Processes and Sub-Processes	
	Social-Cognitive Theory (Bandura, 1991)	Social-Cognitive Model of Self-Regulation (Zimmerman, 2000)
I give-up quickly	Self-monitoring sub-function: <i>Self-motivational beliefs/self-efficacy mechanism and valuation of activities</i>	Forethought phase: <i>Self-motivational beliefs/self-efficacy and task interest</i>
	Self-reactive sub-function: <i>Self-reaction</i>	Self-reflection: <i>Self-reaction/satisfaction</i>
Once I have a goal, I can usually plan how to reach it	Development of personal standards: <i>Goal-setting</i> <i>Strategic planning</i>	Forethought phase: <i>Task analysis/goal setting and strategic planning</i>
If I make a resolution to change something, I pay a lot of attention to how I'm doing	Self-monitoring sub-function: <i>Self-diagnosis</i>	Performance phase: <i>Self-observation/meta cognitive monitoring</i> <i>Self-control/attention focusing</i>

Often I don't notice what I'm doing until someone calls it to my attention	Self-monitoring sub-function: <i>Self-diagnosis</i>	Performance phase: <i>Self-observation/meta cognitive monitoring</i> <i>Self-control/attention focusing</i>
I set goals for myself and keep track of my progress	Development of personal standards: <i>Goal-setting</i>	Forethought phase: <i>Task analysis/goal setting</i>
	Self-monitoring sub-function: <i>Self-diagnosis</i>	Performance phase: <i>Self-observation/recording</i>
Most of the time I don't pay attention to what I'm doing	Self-monitoring sub-function: <i>Self-diagnosis</i>	Performance phase: <i>Self-observation/recording</i>
		Performance phase: <i>Self-control/attention focusing</i>
I tend to keep doing the same thing, even when it doesn't work	Self-reactive sub-function: <i>Self-reaction</i>	Self-reflection: <i>Self-reaction/adaptive and defensive inferences</i>
I have a hard time setting goals for myself	Development of personal standards: <i>Goal-setting</i>	Forethought phase: <i>Task analysis/goal setting</i> <i>Self-motivational beliefs/self-efficacy and task interest</i>

I have a lot of willpower	Judgmental sub-function: <i>Perceived performance determinants</i>	Forethought phase: <i>Self-motivational beliefs</i> Performance: <i>Self-control</i>
When I'm trying to change something, I pay a lot of attention to how I'm doing	Self-monitoring sub-function: <i>Self-diagnosis</i>	Performance phase: <i>Self-observation/meta cognitive monitoring</i> <i>Self-control/attention focusing</i>
I have trouble making plans to help me reach my goals	Development of personal standards: <i>Goal-setting</i> <i>Strategic planning</i>	Forethought phase: <i>Task analysis/goal setting and strategic planning</i> Performance: <i>Task strategies</i>
If I wanted to change, I am confident that I could do it	Self-monitoring sub-function: <i>Self-motivational beliefs/self-efficacy mechanism and valuation of activities</i>	Forethought phase: <i>Self-motivational beliefs/self-efficacy and task interest</i>
When it comes to deciding about a change, I feel overwhelmed by the choices	Self-reactive sub-function: <i>Self-reaction</i>	Self-reflection: <i>Self-reaction/adaptive and defensive inferences</i>
I have trouble following through with things once I've made up my mind to do something	Self-monitoring sub-function: <i>Self-motivation sub-processes</i>	Performance phase: <i>Self-control/Attention focusing</i>

I have trouble making up my mind about things	Self-monitoring sub-function: <i>Self-motivational beliefs/self-efficacy mechanism and valuation of activities</i>	Forethought phase: <i>Self-motivational beliefs/self-efficacy and task interest</i> Performance phase: <i>Self control/task strategies and attention focusing</i>
I get easily distracted from my plans	Self-monitoring sub-function	Performance phase: <i>Self-control/Attention focusing</i>
I don't notice the effects of my actions until it's too late	Self-monitoring sub-function: <i>Self-diagnosis</i> Judgmental sub-function: <i>Self-evaluation</i>	Performance phase: <i>Self-observation/meta cognitive monitoring</i> Self-reflection phase: <i>Self-judgment/self-evaluation</i>
I am able to accomplish goals I set for myself	Development of Personal Standards: <i>Goal-setting</i> Self-monitoring sub-function: <i>Self-motivational beliefs/self-efficacy mechanism</i> Judgmental sub-function: <i>Self-evaluation</i>	Forethought phase: <i>Self-motivational beliefs/self-efficacy and outcome expectations</i> <i>Task analysis/goal setting</i> Self-reflection phase: <i>Self-judgment and evaluation</i>

I put off making decisions	Self-monitoring sub-function: <i>Self-motivational beliefs/self-efficacy mechanism and task interest</i>	Forethought phase: <i>Self-motivational beliefs/self-efficacy and task interest</i> Performance phase: <i>Self-control</i>
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Appendix F

Phases 1 and 2 Research Questions Addressed in Feature Articles and Supplemental Results

Research Question	Article 1	Article 2	Article 3	Supplemental Results
<i>Phase 1 - Quantitative</i>				
What is the level of psychological and affective well-being of physicians?	What are the levels of psychological and affective well-being and self-regulation capacity of physicians and resident physicians?			
What is the level of self-regulation capacity of physicians?				
What is the relationship between physicians' levels of psychological and affective well-being and self-regulation capacity?	Are there significant differences in psychological and affective well-being between physicians and resident physicians with high and low self-regulation capacity?	Can physicians' level of self-regulation capacity significantly predict their level of psychological well-being?		
Does status (i.e., physicians versus resident physicians) influence the relationship between affective and psychological well-being and self-regulation capacity?				

Phase 2 - Qualitative

How do physicians experience psychological well-being and self-regulation?

What are physicians' experiences of psychological well-being (i.e., high and low functioning with regards to autonomy, environmental mastery, positive relations with others, personal growth, self-acceptance, purpose in life)?

How do physicians experience self-regulation (i.e., forethought, performance, self-reflection phases of self-regulation)?

What role does self-regulation capacity play in the well-being of physicians?

What role do physicians perceive their self-regulation capacity to play in their well-being?

What enhances and inhibits physicians' well-being and self-regulation capacity?

What enhances and inhibits physicians' well-being?

What enhances and inhibits physicians' self-regulation capacity?

Appendix G

Recruitment Tools, Letters of Information and Consent

The following documents are the templates for the recruitment tools (e.g., e-mails) used to request permission to recruit participants, as well as letters of information and consent forms for Phases 1 and 2.

Letter of Permission to Recruit Research Participants

Dear _____ (*name of organization*),



uOttawa

Université d'Ottawa
Faculté des sciences
de la santé

University of Ottawa
Faculty of Health
Sciences

The purpose of this letter is to obtain your permission to recruit participants from your organization for a study on physician well-being conducted at the University of Ottawa.

The purpose of this letter is to ask for your help in the **recruitment of participants** for a study on physician well-being conducted in the Faculty of Health Sciences, at the University of Ottawa. As a critical member of the healthcare system in (*INSERT Canada or Province*), your involvement would be greatly beneficial to the advancement of our understanding of the well-being of physicians and medical residents in Canada.

Recruitment Involvement: If you agree to do so we will e-mail you a prepared invitation, whereby using any means at your disposal (e.g., e-mail, website link), we would appreciate your efforts to forward it to any practicing physician or medical resident within your jurisdiction.

Participant Involvement: Participants will complete an online demographic survey and three questionnaires on well-being and self-regulation, which will take 20-30 minutes. Upon completion of the questionnaires, they will have the opportunity to accept or decline participation in the second phase of the study, in which physicians who meet the eligibility criteria will be randomly selected for a one-hour interview.

Recruitment Goal: Our aim is to recruit 150 physicians and medical residents from across the country for Phase 1, and 10 to 12 for Phase 2.

Benefits: Our line of research corresponds to the mandate of the Canadian Medical Association who put forth the Policy on Physician Health and Well-Being. An exhaustive literature review suggests that physicians have a low level of well-being and that little is known about well-being beyond pathology. This may be distorting our perceptions of what is optimal well-being in the medical environment, and may be limiting our understanding of means to help physicians engage in and sustain positive and healthy living. This study is important as it will substantiate the level of well-being of Canadian physicians and also investigate self-regulatory strategies that could enable them to maintain an adequate level of well-being throughout their career.

Ethics: This research project has been reviewed by, and has received a notice of ethics approval from, the Research Ethics Board of the University of Ottawa.

Please contact Christopher Simon (see below) to let us know if and how you may help us recruit participants. Any guidance you could provide to our efforts would be greatly appreciated. In the event that you will collaborate, we will send you a letter of permission required by the Research Ethics Board of the University of Ottawa. Do not hesitate to contact us if you have any questions or concerns.

☎ 613-562-5432
📠 613-562-5437

451 Smyth (3028)
Ottawa ON K1H 8M5 Canada
www.uOttawa.ca



uOttawa

Université d'Ottawa
Faculté des sciences
de la santé

University of Ottawa
Faculty of Health
Sciences

Consent: By signing this letter of permission, we

_____ (*name of organization*) hereby give our consent to allow the researchers, Christopher Simon, Ph.D. Candidate (primary investigator) and Dr. Natalie Durand-Bush, of the University of Ottawa, Faculty of Health Sciences, School of Human Kinetics, to solicit our members who are qualified, licensed physicians practicing medicine in Canada to participate in this study on physician well-being.

Name: _____ **Title:** _____

Date: _____

Thank you for your cooperation in the recruitment of participants for this study. Please contact us if you have any questions or concerns.

Sincerely,

Christopher Simon, PhD. (Candidate)
School of Human Kinetics, Faculty of Health Sciences,
University of Ottawa

Natalie Durand-Bush, Ph.D.
School of Human Kinetics, Faculty of Health Sciences,
University of Ottawa

☎ 613-562-5432
📠 613-562-5437

451 Smyth (3028)
Ottawa ON K1H 8M5 Canada
www.uOttawa.ca

Prepared E-Mail Invitation for Phase 1 Participant Recruitment

Subject Line: You Can Make A Difference: Physician Well-Being Study Recruitment

E-Mail Body: Salutations,

As a physician or resident practicing medicine in Canada, you are invited to participate in a study on physician well-being. If you agree to participate, your involvement will consist of completing a short demographic survey and three questionnaires on well-being and self-regulation online via a secure website. This will take approximately 20-30 minutes.

By participating in this research, you will increase our understanding of the level of well-being of physicians in Canada. This corresponds to the mandate of the Canadian Medical Association who put forth the Policy on Physician Health and Well-Being (Puddester, 2001). Your participation is important because an exhaustive literature review suggests that physicians have lower levels of well-being and that little is known about well-being beyond pathology. This may be distorting our perceptions of what is “optimal well-being” in the medical environment, and may be limiting our understanding of means in which physicians can engage to achieve and sustain positive and healthy living. This study will bring the level of well-being of Canadian physicians to light and identify self-regulatory strategies that could lead them to maintain adequate levels of well-being throughout their career.

You are undoubtedly extremely busy, however, **you can make a difference** by participating in this study. You may also personally benefit from your participation by gaining insight into your own well-being and what enhances and inhibits it.

This research project has been reviewed and has received a notice of ethics approval from the Research Ethics Board of the University of Ottawa.

TO BEGIN

If you agree to participate, please see the letter of information and consent below that describes the study in greater detail. By clicking the following link, you will be taken to the secure website where you can complete the questionnaires:

<https://www.surveymonkey.com/s/JH2HX3T>

Thank you for your valuable time and participation. Please contact us if you have any questions or concerns.

Sincerely,

Christopher Simon, Ph.D. (Candidate)

Natalie Durand-Bush, Ph.D.

Prepared E-Mail Letter of Information and Consent for Phase 2 Participant Recruitment

Subject Line: Physician Well-Being Study, Interview Recruitment

E-Mail Body: Dear Dr. *(name)*,

Thank you for participating in Phase 1 of this study on physician well-being. You have been selected to participate in Phase 2 of which the purpose is to explore more in-depth the nature of physician well-being and the role that self-regulation may or may not play in its enhancement.

If you wish to participate in Phase 2, please respond YES to this e-mail and the principal researcher, Christopher Simon, will contact you shortly via e-mail to set-up an interview. By responding YES, you are acknowledging that you have read the information below and you give you consent to participate in Phase 2 of this study.

If you wish to decline this invitation, please respond NO to this e-mail.

Involvement: Your participation in Phase 2 of this research consists of an individual telephone interview that will be scheduled at a time convenient to both you and the researcher. In the event that you live within a 100 km radius of the city of Ottawa, Ontario where the researcher resides, the interview will be conducted in person at a time and location that is convenient to both you and the researcher. The interview will be audio-recorded and last approximately 60 minutes. You will also be subsequently invited to read your interview transcript in order to verify the information you provided and make any necessary changes. This should take anywhere between 15 to 30 minutes. You will be able to choose to receive and return the interview transcript by email or by regular mail, in which case a pre-addressed stamped envelope will be provided. It is important to note that no extra security measures will be taken to exchange information through email.

Benefits: By participating in this research, you will increase our understanding of the level of well-being of physicians in Canada. This corresponds to the mandate of the Canadian Medical Association who put forth the Policy on Physician Health and Well-Being. In this second phase of the study, you will have the opportunity to discuss well-being as well as self-regulation in greater depth. By doing so, you may increase your awareness of your own level of well-being and self-regulation. You may come to recognize skills, strategies, and processes that are within your control to enhance your well-being and more effectively manage yourself and your environment.

Potential Risks: Although very minimal, a potential risk from participating in the second phase of the study is that you could experience some discomfort when discussing instances of reduced levels of well-being and self-regulation, if this is applicable. In order to minimize any potential risk, it is important to realize that the information you choose to share is entirely at your discretion. The researcher will not encourage you to discuss anything with which you are uncomfortable. Should you start experiencing discomfort, the researcher will change topics. You are free to withdraw from the study at any time if you wish to do so. If you regret disclosing personal information at any time, this information will be removed from the data. Furthermore, if you feel at any point that additional support would be beneficial or required, an appropriate referral will be made.

Ethics: This research project has been reviewed and has received a notice of ethics approval from the Research Ethics Board of the University of Ottawa. Your participation is completely voluntary, and you may withdraw from the study at any time and/or refuse to answer questions without any negative consequence. If you choose to withdraw, you will have the opportunity to also withdraw all data

collected related to your participation, in which case it will be destroyed. Your responses will remain anonymous and confidential, and no information that could reveal your identity will be used. Physical data including printed interview transcripts and audio-tapes will be kept in the researcher's locked laboratory and locked cabinet. Electronic data will be saved on the researcher's password protected computer. All of the data will be conserved for 5 years after completion of the project, after which it will be destroyed. The information that you share may be used in conference presentations and publications in scientific journals, however, your anonymity is guaranteed at all times. As a participant, you must be able to read and speak English as each interview will be conducted in English only. Any information requests or complaints about the ethical conduct of the project may be addressed to the Protocol Officer for Ethics in Research, Tabaret Hall, 550 Cumberland Street, Room 159, Ottawa, ON, K1N 6N5, tel.: 613-562-5841, e-mail: ethics@uottawa.ca.

Thank you for your time and participation. Please contact us if you have any questions or concerns.

Sincerely,

Christopher Simon, Ph.D. (Candidate)
School of Human Kinetics, Faculty of Health Sciences
University of Ottawa

and

Natalie Durand-Bush, Ph.D.
School of Human Kinetics, Faculty of Health Sciences
University of Ottawa

Appendix H

Demographic Survey

Please answer the following demographic questions by checking off the appropriate box and/or filling in the blank.

1. Name: _____

2. Email address: _____

3. Gender: Male ☐ Female ☐

4. Age: _____

5. Marital status:

- ☐ Single
- ☐ In a relationship
- ☐ Married
- ☐ Separated
- ☐ Divorced
- ☐ Widowed

6. Number of dependent children under 18 years of age: _____

7. Medical specialty(s) (e.g., family medicine, cardiology, pediatrics): _____

8. Number of years of practice: _____

9. Current province of practice: _____

10. Practice setting:

- ☐ Rural ☐ Urban

11. Type of practice:

- ☐ Clinical/Hospital ☐ Private Practice

12. Resident:

- ☐ Yes ☐ No

Appendix I

Scales of Psychological Well-Being (SPWB) (Ryff & Keyes, 1995)

Presentation Format/Scoring: Items from the separate scales are **mixed** (by taking one item from each scale successively into one continuous self-report instrument).

Participants respond using a six-point format: strongly disagree (1), moderately disagree (2), slightly disagree (3), slightly agree (4), moderately agree (5), strongly agree (6).

Responses to negatively scored items (-) are reversed in the final scoring procedures so that high scores indicate high self-ratings on the dimension assessed.

AUTONOMY

- (-) 1. Sometimes I change the way I act or think to be more like those around me.
- (+) 7. I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.
- (+) 13. My decisions are not usually influenced by what everyone else is doing.
- (-) 19. I tend to worry about what other people think of me.
- (+) 25. Being happy with myself is more important to me than having others approve of me.
- (-) 31. I tend to be influenced by people with strong opinions.
- (+) 37. People rarely talk me into doing things I don't want to do.
- (-) 43. It is more important to me to "fit in" with others than to stand alone on my principles.
- (+) 49. I have confidence in my opinions, even if they are contrary to the general consensus.
- (-) 55. It's difficult for me to voice my own opinions on controversial matters.
- (-) 61. I often change my mind about decisions if my friends or family disagree.
- (+) 67. I am not the kind of person who gives in to social pressures to think or act in certain ways.
- (-) 73. I am concerned about how other people evaluate the choices I have made in my life.
- (+) 79. I judge myself by what I think is important, not by the values of what others think is important.

ENVIRONMENTAL MASTERY

- (+) 2. In general, I feel I am in charge of the situation in which I live.
- (-) 8. The demands of everyday life often get me down.
- (-) 14. I do not fit very well with the people and the community around me.
- (+) 20. I am quite good at managing the many responsibilities of my daily life.
- (-) 26. I often feel overwhelmed by my responsibilities.
- (+) 32. If I were unhappy with my living situation, I would take effective steps to change it.
- (+) 38. I generally do a good job of taking care of my personal finances and affairs.
- (-) 44. I find it stressful that I can't keep up with all of the things I have to do each day.
- (+) 50. I am good at juggling my time so that I can fit everything in that needs to get done.
- (+) 56. My daily life is busy, but I derive a sense of satisfaction from keeping up with everything.

- (-) 62. I get frustrated when trying to plan my daily activities because I never accomplish the things I set out to do.
- (+) 68. My efforts to find the kinds of activities and relationships that I need have been quite successful.
- (-) 74. I have difficulty arranging my life in a way that is satisfying to me.
- (+) 80. I have been able to build a home and a lifestyle for myself that is much to my liking.

PERSONAL GROWTH

- (-) 3. I am not interested in activities that will expand my horizons.
- (+) 9. In general, I feel that I continue to learn more about myself as time goes by.
- (+) 15. I am the kind of person who likes to give new things a try.
- (-) 21. I don't want to try new ways of doing things--my life is fine the way it is.
- (+) 27. I think it is important to have new experiences that challenge how you think about yourself and the world.
- (-) 33. When I think about it, I haven't really improved much as a person over the years.
- (+) 39. In my view, people of every age are able to continue growing and developing.
- (+) 45. With time, I have gained a lot of insight about life that has made me a stronger, more capable person.
- (+) 51. I have the sense that I have developed a lot as a person over time.
- (-) 57. I do not enjoy being in new situations that require me to change my old familiar ways of doing things.
- (+) 63. For me, life has been a continuous process of learning, changing, and growth.
- (+) 69. I enjoy seeing how my views have changed and matured over the years.
- (-) 75. I gave up trying to make big improvements or changes in my life a long time ago.
- (-) 81. There is truth to the saying you can't teach an old dog new tricks.

POSITIVE RELATIONS WITH OTHERS

- (+) 4. Most people see me as loving and affectionate.
- (-) 10. Maintaining close relationships has been difficult and frustrating for me.
- (-) 16. I often feel lonely because I have few close friends with whom to share my concerns.
- (+) 22. I enjoy personal and mutual conversations with family members or friends.
- (+) 28. It is important to me to be a good listener when close friends talk to me about their problems.
- (-) 34. I don't have many people who want to listen when I need to talk.
- (+) 40. I feel like I get a lot out of my friendships.
- (-) 46. It seems to me that most other people have more friends than I do.
- (+) 52. People would describe me as a giving person, willing to share my time with others.
- (-) 58. I have not experienced many warm and trusting relationships with others.
- (-) 64. I often feel like I'm on the outside looking in when it comes to friendships.
- (+) 70. I know that I can trust my friends, and they know they can trust me.
- (-) 76. I find it difficult to really open up when I talk with others.
- (+) 82. My friends and I sympathize with each other's problems.

PURPOSE IN LIFE

- (+) 5. I feel good when I think of what I've done in the past and what I hope to do in the future.
 - (-) 11. I live life one day at a time and don't really think about the future.
 - (-) 17. I tend to focus on the present, because the future nearly always brings me problems.
 - (+) 23. I have a sense of direction and purpose in life.
 - (-) 29. My daily activities often seem trivial and unimportant to me.
 - (-) 35. I don't have a good sense of what it is I'm trying to accomplish in life.
 - (-) 41. I used to set goals for myself, but that now seems like a waste of time.
 - (+) 47. I enjoy making plans for the future and working to make them a reality.
 - (+) 53. I am an active person in carrying out the plans I set for myself.
 - (+) 59. Some people wander aimlessly through life, but I am not one of them.
 - (-) 65. I sometimes feel as if I've done all there is to do in life.
 - (+) 71. My aims in life have been more a source of satisfaction than frustration to me.
 - (+) 77. I find it satisfying to think about what I have accomplished in life.
 - (-) 83. In the final analysis, I'm not so sure that my life adds up to much.
-

SELF-ACCEPTANCE

- (+) 6. When I look at the story of my life, I am pleased with how things have turned out.
 - (+) 12. In general, I feel confident and positive about myself.
 - (-) 18. I feel like many of the people I know have gotten more out of life than I have.
 - (-) 24. Given the opportunity, there are many things about myself that I would change.
 - (+) 30. I like most aspects of my personality.
 - (+) 36. I made some mistakes in the past, but I feel that all in all everything has worked out for the best.
 - (-) 42. In many ways, I feel disappointed about my achievements in life.
 - (+) 48. For the most part, I am proud of who I am and the life I lead.
 - (-) 54. I envy many people for the lives they lead.
 - (-) 60. My attitude about myself is probably not as positive as most people feel about themselves.
 - (-) 66. Many days I wake up feeling discouraged about how I have lived my life.
 - (+) 72. The past had its ups and downs, but in general, I wouldn't want to change it.
 - (+) 78. When I compare myself to friends and acquaintances, it makes me feel good about who I am.
 - (-) 84. Everyone has their weaknesses, but I seem to have more than my share.
-

Appendix J

Positive and Negative Affect Schedule (PANAS) (Watson et al., 1988)

This scale consists of a number of words that describe different feelings and emotions. Read each item, and mark the appropriate answer in the space next to that word using the 1-5 point Likert scale below. Indicate to what extent you have felt this way during the past few days. Use the following scale to record your answers.

1 = Very slightly or not at all

2 = A little

3 = Moderately

4 = Quite a bit

5 = Extremely

_____interested

_____distressed

_____excited

_____upset

_____strong

_____guilty

_____scared

_____hostile

_____enthusiastic

_____proud

_____irritable

_____alert

_____ashamed

_____inspired

_____nervous

_____determined

_____attentive

_____jittery

_____active

_____afraid

Appendix K

Short Form - Self-Regulation Questionnaire (SSRQ) (Carey, Neal, & Collins, 2004; adapted from SRQ, Brown, Miller, & Lewendowski, 1999)

Please answer the following questions by circling the response that best describes how you are. If you **STRONGLY DISAGREE** with a statement, circle 1. If you **DISAGREE** circle 2. If you are **UNCERTAIN** or **UNSURE** circle 3. If you **AGREE** circle 4, and if you **STRONGLY AGREE** circle 5. There are no right or wrong answers. Work quickly and don't think too long about your answers.

R = Reverse Scored

Strongly Disagree	Disagree	Uncertain Or Unsure	Agree	Strongly Agree	
1	2	3	4	5	
1. I usually keep track of my progress toward my goals.					1 2 3 4 5
2. I have trouble making up my mind about things. R					1 2 3 4 5
3. I get easily distracted from my plans. R					1 2 3 4 5
4. I don't notice the effects of my actions until it's too late. R					1 2 3 4 5
5. I am able to accomplish goals I set for myself.					1 2 3 4 5
6. I put off making decisions. R					1 2 3 4 5
7. It's hard for me to notice when I've "had enough" (alcohol, food, exercise). R					1 2 3 4 5
8. If I wanted to change, I am confident that I could do it.					1 2 3 4 5
9. When it comes to deciding about a change, I feel overwhelmed by the choices. R					1 2 3 4 5
10. I have trouble following through with things once I've made up my mind to do something. R					1 2 3 4 5
11. I don't seem to learn from my mistakes. R					1 2 3 4 5
12. I can stick to a plan that's working well.					1 2 3 4 5
13. I usually only have to make a mistake one time in order to learn from it.					1 2 3 4 5
14. I have personal standards, and try to live up to them.					1 2 3 4 5
15. As soon as I see a problem or challenge, I start looking for possible solutions.					1 2 3 4 5
16. I have a hard time setting goals for myself. R					1 2 3 4 5
17. I have a lot of willpower.					1 2 3 4 5
18. When I'm trying to change something, I pay a lot of attention to how I'm doing.					1 2 3 4 5
19. I have trouble making plans to help me reach my goals. R					1 2 3 4 5
20. I am able to resist temptation. R					1 2 3 4 5
21. I set goals for myself and keep track of my progress.					1 2 3 4 5
22. Most of the time I don't pay attention to what I'm doing. R					1 2 3 4 5
23. I tend to keep doing the same thing, even when it doesn't work. R					1 2 3 4 5
24. I can usually find several different possibilities when I want to change something.					1 2 3 4 5
25. Once I have a goal, I can usually plan how to reach it.					1 2 3 4 5
26. If I make a resolution to change something, I pay a lot of attention to how I'm doing.					1 2 3 4 5
27. Often I don't notice what I'm doing until someone calls it to my attention. R					1 2 3 4 5
28. I usually think before I act.					1 2 3 4 5
29. I learn from my mistakes.					1 2 3 4 5
30. I know how I want to be.					1 2 3 4 5
31. I give up quickly. R					1 2 3 4 5

Appendix L

Semi-Structured Interview Guide

A. GENERAL OPENING QUESTIONS:

1. Why did you/want to become a physician?
2. Why did you/what motivated you to participate in this study?

B. WELL-BEING:

General

1. What is well-being to you (e.g., what does it mean/how do you define it)?

In-Depth

Self-Acceptance [dimension of PWB, and Satisfaction With Life dimension of SWB]

1. How would you assess yourself, past and present (e.g., are you satisfied, dissatisfied)?

Probes

- How would you assess the multiple aspects/areas of your life (e.g., being a physician/resident and family) – the good and the bad?

Positive Relations With Others [dimension of PWB]

1. How would you describe the quality of your relationships with others (e.g., colleagues, friends, family, significant others, patients)?

Probes

- How important are these relationships to you, and your ability to maintain them?
- What do you receive on a personal level from social relationships with others?
- What do others receive from social relationships with you?

Autonomy [dimension of PWB]

1. How much control do you feel you have over your behavior and actions (e.g., do you feel self-determined)?

Probes

- How important is it for you to fulfill the personal and professional expectations you have of yourself? The expectations of others?
- In evaluating your behaviors and actions, do you put more weight on self-evaluations or evaluations from others?

Environmental Mastery [dimension of PWB]

1. How would you describe your ability to manage your work environment as a physician/resident?
2. What about your personal life?

Probes

- Are you able to balance the various day-to-day personal and professional activities within your life? If so, how do you manage this balance (e.g., surrounding opportunities)?

- How would you evaluate your ability to seek-out contexts suitable to meet your personal needs and values (e.g., taking time for yourself, pursuing hobbies, or choosing facilitative work environments)?

Purpose in Life [dimension of PWB]

1. What is your purpose in life – on micro and/or macro levels (e.g., personally and/or as a physician/resident)?
2. Looking back at your life what are most proud of (e.g., meaningful contributions)?
3. What sense of direction do your goals, beliefs, values give you?

Personal Growth [dimension of PWB]

1. How important is it for you to continually expand/build on your personal and professional skills (e.g., realize your potential)?
- Probes*
- How would you describe your ability to recognize changes in your actions and behaviors over time?

Positive and Negative Affect [balance of positive and negative affect of SWB]

1. How do you typically feel on a day-to-day basis (e.g., general mood and/or the positive and negative emotions you experience)?

Probes

- What role do they play in your overall well-being?
- How would you describe your ability to balance positive and negative emotions?

Summative

1. What is your current level of well-being (e.g., in personal and medical practice contexts)?
2. What influences your well-being (e.g., what enhances and inhibits)?
3. Can you improve your well-being? Why?

C. SELF-REGULATION:

General

1. What is self-regulation to you (e.g., how do you define it)? What is its purpose?

In-Depth

Forethought:

Task Analysis (e.g., setting goals/preferred standards, strategically plan)

1. What goals (e.g., standards) do you set for yourself in life in general (e.g., micro and/or macro level) [SCT; judgmental sub-function] (Examples: a new personal or professional challenge)
2. If so, how do you set them – what is their source [SCT; judgmental sub-function]? When you set goals/standards, are they based on internally or externally held beliefs, values, or interests – modeled from others, etc.?
3. Do your goals vary in different contexts (e.g., personal and medical life)? If so, how? [SCT; judgmental sub-function]
4. Do you establish and/or follow a plan to achieve them (e.g., set strategies)?

Self-Motivational Beliefs (e.g., self-efficacy, outcome expectations, and task interest) [SCT; self-monitoring sub-function: motivation]

1. When you set goals/ standards, in general, how confident are you that you will achieve them? (e.g., optimistic? pessimistic?) [SCT; self-efficacy mechanism]
2. In general, when striving for these set goals/standards what do you typically expect to happen? (e.g., outcome expectations?)
3. How important are setting goals/standards to you? [SCT; judgmental sub-function: the valuation of activities]

Performance:

Self-Control (e.g., task strategies, attention focusing, and self-instruction)

1. What types of strategies (e.g., formal and/or informal) do you use to achieve your goals/ standards (e.g., do you try optimize your efforts)?
2. In general, how would you describe your ability to maintain focus on the tasks required to achieve them?

Self-Observation + Self-Recording and Meta-Cognitive Monitoring:

[SCT; self-monitoring sub-function: self-diagnostic processes]

1. Do you observe and/or track specific aspects of your efforts to achieve your goals/standards? If so, what effect does this have?
2. Do you use any techniques to observe yourself (e.g., take notes, self-talk, etc.)? Describe.

Probes

- What effect do these have on the quality of the feedback you receive?

Self-Reflection:

Self-Judgment (e.g., self-evaluation and causal attributions) [SCT; self-judgment sub-function: self-reaction]

1. How do you use the information you gather and reflect on yourself (e.g., compare self-monitored data from self-observations/tracking with your set goals/standards)? Can you describe a situation/example?
2. In general, to what do you attribute (e.g., level of ability and/or effort) the outcomes of your efforts/actions in striving for your goals/standards?

[SCT; judgmental sub-function: perceived performance determinants]

Self-Reaction (e.g., self-satisfaction and adaptive or defensive inferences) [SCT; self-reactive sub-function: self-satisfaction]

1. In general, do you create incentives (e.g., material or intangible) to achieve your goals/standards? If so, can you give an example?
2. What role does how you feel about your actions/efforts (e.g., level of satisfaction or dissatisfaction) typically play in subsequent efforts to achieve your goals/standards, or future ones (e.g., motivate you to be proactive, or withdraw future efforts)? [SCT; self-monitoring sub-function: motivation]

Summative

1. What is your current level of self-regulation (e.g., in personal life and medical career)?

Probes

- Overall, to what do you attribute your general capacity or incapacity to self-regulate? What influences it (e.g., enhances and/or inhibits)?
 - What role do your thoughts, feelings, and actions play?
 - What role do your social and physical environments/factors play?
2. Can you improve your self-regulation? How? Is it an ability, or skill, or both?

D. ROLE OF SELF-REGULATION IN WELL-BEING:

1. What role do you feel self-regulation plays in your well-being, if any (e.g., in personal and medical contexts)?

Probes

- Does your capacity or incapacity to self-regulate affect your well-being – or visa-versa? Explain.

E. ROLE OF MEDICAL PROFESSION IN SELF-REGULATION AND WELL-BEING:**[If Time Permits]**

1. What do you need from your profession to best facilitate, develop, and/or maintain an effective level of (a) self-regulation and (b) well-being, in your personal and professional life (e.g., human resources, physical resources, time for yourself, education, interventions)?
2. How would you rate the importance of effectively regulating your well-being to effectively/successfully perform as a physician?
3. How does the medical training process, and practice of medicine influence your self-regulation? Your well-being? (e.g., what facilitates and inhibits).
4. What advice, if any, would you give to medical students or others entering the medical profession with respect to well-being (and/or self-regulation)?

F. SUMMARY QUESTIONS AND COMMENTS:

1. What do you take away from this interview?
2. Would you like to add anything else?

*****Thank you for your participation in this study*****