

Academic Paper

# Making the Grade: Mentors' Perspectives of a Course-Based, Smart, Healthy Campus Pilot Project for Building Mental Health Resiliency Through Mentorship and Physical Activity

Rebecca R. Fried (Western University, Ontario)  
Shazya Karmali (Western University, Ontario)  
Jennifer D. Irwin [✉](mailto:jirwin@westernu.ca) (Western University, Ontario)  
Francesca L. Gable (Western University, Ontario)  
Alan Salmoni (Western University, Ontario)

## Abstract

The purpose of this academic-year-long pilot study was to explore senior Kinesiology students' (i.e., 'mentors';  $N = 30$ ) experiences in an undergraduate course focused on building resilience among first-years via physical activity (PA) and mentorship. The psychosocial experiences of mentors were also tracked via qualitative interviews and validated questionnaires at pre-, mid-, and post-intervention. Inductive content analysis revealed mentors' perspectives of the program's positive influence on their PA, resilience, and mental health; and some added stressors. One-way, repeated-measures ANOVAs indicated few statistically significant findings over time regarding participants' levels of: resilience [ $F(2, 54) = 8.82, p < .05$ ]; behavioural control [ $F(2, 54) = 25.44, p < .05$ ]; and positive affect [ $F(2, 54) = 52.97, p < .05$ ]. This pilot program demonstrates promise for future university-based interventions.

## Keywords

Mentor, Physical Activity, Mental health, Resiliency, University Students,

## Article history

Accepted for publication: 01/06/2018

Published online: 20/07/2018



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Published by Oxford Brookes University

## Introduction

Campus mental health issues are ubiquitous. Mental health – “a state of well-being in which every individual realizes his or her own potential and can cope with the normal stresses of life” (World Health Organization [WHO], 2003, p. 7) – is becoming a more prominent issue, specifically surrounding university students (Canadian Institute for Health Information, 2015). Recently, 46% of Ontario university students revealed they felt so depressed it was challenging to function, while 65% expressed overwhelming anxiety, and 61% reported feeling hopeless (American College Health Association [ACHA], 2016). With respect to the study's host institution, 56% of students rated their overall stress levels as 'more than average' or 'tremendous'; and 33% reported stress affected their academic performance, while 27% reported it was impacted by anxiety (ACHA, 2013). A staggering 86% of students described feeling overwhelmed by their

obligations (ACHA, 2013). Further, a survey conducted at the host institution revealed 30% of respondents ranked access to a mental health care practitioner on campus as poor (Hall, 2017). This information is important; given that health is often accepted as an all-encompassing construct with many fundamental building blocks, known as the (social) determinants of health, all of which interact and affect each other (Mikkonen & Raphael, 2010; WHO, 2003). While many determinants have been identified as being crucial influences for health, some appear to be 'more important' than others, with education being one of the most crucial (Feinstein, Sabates, Anderson, Sorhaindo, & Hammond, 2006). It is suggested that people with higher levels of education are healthier than those with lower levels (Mikkonen & Raphael, 2010).

Universities have begun to focus on interventions in a manner that address a myriad of determinants related to mental, and overall, health (Council of Ontario Universities, 2017; Ontario's Universities, 2018). Many programs exist across different universities, and are often focused on physical activity, mentoring or peer-leadership, and/or resiliency. While some interventions combine these elements, the researchers of the current study are unaware of any studies or programs that have included all three in a single intervention, especially with respect to university students.

## Mentorship, physical activity, and resiliency

### Mentorship

The premise of the Smart, Healthy Campus pilot study (SHC) was to pair third- and fourth-year students with first-year students, wherein senior students mentor the first-years. According to the Mental Health Commission of Canada (MHCC; 2016), peer-to-peer interactions are a critical component of mental health. Mentoring is described as a supportive relationship between people who have a common lived experience, where a mentor provides emotional and social support to mentees (MHCC, 2016). Also described as – and used interchangeably with – peer-assisted learning, mentoring is a process wherein individuals learn from and with each other (Jenkinson, Naughton, & Benson, 2012). Mentorship provides benefits to those who act as mentors, and has been deemed a rewarding experience (Durham University, 2017). Merit of mentorship include: (a) personal development and self-reflection; (b) the ability to learn from others; (c) acquiring new skills; (d) building a support network; (e) career enhancement; (f) gratification from helping younger individuals; and (g) receiving external recognition and praise (Allen, Poteet, & Burroughs, 1997; Grima, Paillé, Mejia, & Prud'homme, 2014; Kram, 1983; Ragins & Scandura, 1999; Zey, 1984). The specific aim of this paper is to address the experiences of the mentors who participated in the pilot program focused on building resilience among first-years via physical activity (PA) and mentorship.

### Physical activity

Physical activity (PA) has numerous health benefits and has been associated with increases in mental health and resiliency (Hegberg & Tone, 2015). According to a recent systematic review (Dogra et al., 2017), a myriad of literature exemplifies PA as an effective way to: (a) minimize symptoms of depression and anxiety (Stathopoulou, Powers, Berry, Smits, & Otto, 2006); (b) reduce the impact of and protect against negative stress (Nabkasorn et al., 2006); and (c) promote positive emotional wellbeing (Taliaferro, Rienzo, Pigg, Miller, & Dodd, 2009). However, data indicates that 40% to 50% of post-secondary students do not participate in PA (Harbour, Behrens, Kim, & Kitchens, 2008), with 65% of students at the host institution reporting insufficient activity (i.e. less than the recommended 150-minutes per week required for health benefits; Irwin, 2007). Furthermore, being a student seems to facilitate prolonged sitting and sedentary behaviour (Buckworth & Nigg, 2004; Moulin & Irwin, 2017). Thus, given that schools and educational settings are recognized as key health settings for promoting healthy behaviours (Jenkinson et al., 2012; Moulin & Irwin, 2017; WHO, 1998) SHC's goal was to increase PA. However, few health interventions exist at the university level (Jenkinson et al., 2012). Therefore, it has been concluded that more research examining the interactions between PA and mental health among university students is warranted (Dogra et al., 2017).

## Resiliency

Resiliency is the ability to recover from, and cope with, difficult life situations, and is vital for mental wellbeing (Centre for Addiction and Mental Health [CAMH], 2012). The researchers explored two types of resiliency: (a) psychological – “adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress” (American Psychological Association [APA], 2018, para. 4); and (b) academic – “increased likelihood of educational success despite personal adversities or vulnerabilities brought on by environmental conditions” (Wang, Haertel, & Walberg, 1997, p. 119). There is literature supporting the notion that both physical activity and mentoring effectively enhance resilience (Hegberg & Tone, 2015; Zimmerman & Bingenheimer, 2002). Accordingly, as a health promotion project, SHC’s pilot project objective was to provide students with knowledge and skills to build resilience and help cope with mental health, with the intention of reducing the need for clinical interventions.

## Methods

### Research stance

Referred to as “the third methodological movement,” mixed methods research (MMR) has grown dramatically (Cameron, 2011, p. 96). This approach was used in the current study to gain a more complimentary and composite understanding of the study purpose than could have been acquired utilizing only one approach (Shannon-Baker, 2016). That is, the researchers decided that exploring various aspects of the mentors’ experiences of this pilot project could be addressed most thoroughly through a mix of qualitative (inductive) and quantitative (deductive) approaches. Although controversy exists about the tenets of social science research paradigms, and whether paradigms are useful for MMR, identifying the conceptual approach taken *may* be helpful for readers to grasp the authors’ perspective (Shannon-Baker, 2016). As such, for the purpose of transparency, we note that the current study was conducted from paradigm of *pragmatism*, which is considered useful for program- or intervention-based studies, as it underscores “...communication and shared meaning-making in order to create practical solutions to social problems.” (Shannon-Baker, 2016, p. 322). Researchers using a pragmatic approach within MMR emphasize the research questions, while “maintain[ing] both subjectivity in their own reflections on research and objectivity in data collection and analysis” (Shannon-Baker, 2016, p. 322). Informed by Feilzer (2010), the authors’ stance in pragmatism is further reflected in the data analysis procedures, outlined below, which aim to identify the findings from participants while minimizing the influence of our personal views and interpretations.

### Recruitment and participants

Full-time undergraduate students were invited to participate in this pilot study by enrolling in a senior Kinesiology course, which was offered by the host institution (located in Ontario, Canada). Prior to enrolling, students were told that the course included the potential to participate as research subjects. They were given the letter of information and consent form, and were notified that class enrollment did not have to equate to study enrollment. While certain components of the course were required for grading, nothing was used as study data unless consent was provided. Thirty students (herein called mentors) were enrolled in the course and provided consent. The inclusion criteria consisted of being: (a) a full-time undergraduate student; (b) a senior (i.e. third-, fourth-, or fifth-year); and (c) enrolled in the course. There were no dropouts. However, data from only 28 mentors were used for quantitative analyses (Table 1), because one participant did not complete the pre-intervention questionnaire and another skipped multiple items on specific questionnaires, meaning proper scores for those scales could not be computed (i.e. the SF-36 requires at least 50% of questions to be filled out to calculate sub-scale scores, and the MHI indicates that the total score should not be computed if more than 9 questions are skipped). Data from all 30 mentors were used for qualitative analyses<sup>[1]</sup>.

**Table 1: Demographic Information**

Participant Characteristic				
<b>Sex</b>	<b>N</b>	<b>%</b>		
Male	9	32.1		
Female	19	67.9		
<b>Age</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
19	1	3.6	21.36	0.78
20	1	3.6		
21	14	50		
22	11	39.3		
23	1	3.6		

## Procedure

This mixed-methods, full-year pilot study used a repeated-measures design. Participants acted as their own controls (as per Keiffer, 2002), and data collection occurred at three time points: pre-intervention (September 2016), mid-intervention (December 2016), and immediate post-intervention (April 2017). Due to delays in ethics approval, and matching mentors with the first-year Kinesiology students (herein called protégés), qualitative data was not collected at pre-intervention.

Mentors attended a 3-day, 21-hour Leader Effectiveness Training (LET; [Gordon, 2001]), focused on interpersonal communication and conflict resolution competencies, to obtain mentorship skills. A 1-hour Motivational Interviewing (MI; [Miller & Rollnick, 2002]) training was also provided by one of the researchers (JDI) who underscored the importance of encouraging protégés to come up with their own answers to questions wherever possible. Mentors were randomly matched with one to three protégés, whom they mentored for an academic year. The mentor-protégé relationship involved mentors guiding protégés in dealing with stressors. The primary objective was for mentors to engage in PA with their protégés (and to encourage frequent PA) to increase the protégés' mental health and resiliency. A secondary goal was for mentors to provide support on any topic where and when possible. Mentors were asked to engage with their protégés at least twice a week, if not more, and were able to interact with their protégés in any manner and at any place that worked for the group (e.g. phone, text, video-calling, in-person, at the gym, on-campus, off-campus, etc.) During data collection, mentors were not asked to provide specific, personal, and/or confidential information about their protégés.

## Quantitative measures

All measures outlined below were administered at pre-, mid-, and post-intervention.

### Brief Resilience Scale (BRS)

Mentors completed the Brief Resilience Scale (BRS) (Smith et al., 2008), which is the only measure that explicitly evaluates resilience in its original, most basic definition: to bounce back or recover from stress. For example, one question asks: "I tend to bounce back quickly after hard times" (Smith et al., 2008, p. 196). It uses a 5-point Likert-scale (*strongly disagree* to *strongly agree*), consisting of 6 items – with items 1, 3, and 5 being positively worded, and items 2, 4, and 6 negatively worded – and is scored by reverse coding items 2, 4, and 6 and finding the total mean of the six items. Increased means indicate higher levels of resiliency. The BRS has been deemed a reliable means of enumerating resilience (Cronbach's  $\alpha = .0.84-0.87$ ; [Smith et al., 2008; Windle, Bennett, & Noyes, 2011]).

### **Mental Health Inventory (MHI)**

Mentors completed the Mental Health Inventory (MHI) (Veit & Ware, 1983), which is used to quantify mental health status and psychological well-being, and measures overall emotional functioning. It has “four subscales (Anxiety, Depression, Behavioral Control, Positive Affect), and one total score” (National Multiple Sclerosis Society [NMSS], 1997, p. 29). The subscales and total score range from 0-100, with higher scores indicating better mental health. The MHI is an 18-item questionnaire consisting of a 6-point Likert scale ranging from 1 (*all of the time*) to 6 (*none of the time*), with items 1, 3, 5, 7, 8, 10, 13, and 15 assigned a reverse score. It is valid and reliable (Cronbach’s  $\alpha = .93$ ; NMSS, 1997; Ware, Kosinski, & Gandek, 2003), and is a suitable tool for measuring mental health in general populations, in that it was designed to measure general psychological distress and well-being in otherwise ‘healthy’ populations (Veit & Ware, 1983).

### **Short Form (36) Health Survey (SF-36)**

Because it includes additional domains to the tools noted above (i.e. the SF-36 includes aspects of physical functioning, whereas the BRS and MHI assess different aspects of mental health), mentors also completed the Short Form (36) Health Survey (SF-36) (Ware, Kosinski, & Gandek, 2003), which consists of 36 questions and 8 subscales, and evaluates an individual’s perception of physical, emotional, and mental health. The survey has been validated as a feasible, reliable (Cronbach’s  $\alpha = .80$ ; [C. Jenkinson, Coulter, & Wright, 1993]), and simple survey to complete among both general and patient populations (Brazier et al., 1992; Garratt, Ruta, Abdalla, & Russell, 1994). The tool has been used previously on a variety of sub-populations of university students (Ribeiro et al., 2017). To score it, pre-coded numeric values are re-coded per a provided scoring key, with higher scores equating with a more positive state of health. Each item is scored between a range of 0 to 100, with the lowest and highest possible scores being 0 and 100, respectively. According to the scoring guide, “scores are representative of the percentage of the total possible score achieved” (RAND, 2018, para. 3).

## **Qualitative measures**

### **Semi-structured interviews**

To investigate participants’ experiences of the intervention, individual semi-structured interviews were conducted. Interview questions were piloted with the target population to ensure they were congruous with the study objectives (Table 2). Interviews occurred in a research lab on campus, lasted 15 to 50 minutes, were audio-recorded, and transcribed verbatim. To assuage social desirability, *honesty demands* (Bates, 1992) were employed (i.e. participants were told there were no right or wrong answers, nor were there specific answers being sought).

**Table 2 Semi-Structured Interview Questions**

Mid-Intervention	Post-Intervention
What motivated you to join the program?	What was it like to work with your protégé(s)?
What is it like working with your protégé(s)?	What impact did working with your protégé(s) have on you?
What impact is working with your protégé(s) having on you?	What have you learned about who you are as a mentor?
What have you learned so far about who you are as a mentor?	What advice would you give to future mentors in this course?
What else have you noticed about how being a mentor has impacted you, since working with your protégé(s)?	What characteristics would you say are important for a successful mentor-protégé relationship?
How do you see this evolving next term? Referring to either the mentor-protégé relationship and/or the mentorship program.	What else would you like the researchers to know about your mentorship experience so far?
What else would you like the researchers to know about your mentorship experience so far?	

## Quantitative data analysis

Descriptive statistics were run on all quantitative data using IBM SPSS (version 21.0). To determine statistical significance, one-way, repeated-measures ANOVAs were completed with an alpha of 0.05, and were done on all scales and sub-scales. When Mauchly's test of sphericity was violated, a Greenhouse-Geisser correction was applied, and adjusted *p* values were calculated using adjusted degrees of freedom ( $p < .017$ ). A Bonferroni correction was applied to all ANOVAs to control for Type I Error.

## Qualitative data analysis

Transcriptions were analyzed via inductive content analysis (Patton, 2002), permitting the authors to gain an in-depth understanding of participants' mentorship experiences. This method allowed the authors to find common themes, versus fitting data into predetermined categories. NViVO software was used to help organize the data. The researchers adhered to quality assurance steps during data collection and analysis (Guba & Lincoln, 1989) to uphold data trustworthiness, which included: (a) *credibility* – member-checking between questions/at the end of interviews, ensuring responses were accurately understood; (b) *confirmability* – independent completion of inductive content analysis (RRF & SK); (c) *dependability* – researchers debriefed, summarized, and deliberated findings to safeguard against bias; and (d) *transferability* – study methods, procedures, and analyses were documented, permitting others to establish whether or not findings are transferable to other settings.

## Results

Quantitatively, most findings were not statistically significant. See Table 3.

**Table 3 Repeated-Measures ANOVAs (Pre-, Mid, & Post-Intervention)**

Scale	F-Statistic	Pre-Intervention	Mid-Intervention	Post-Intervention	Statistical Significance (Between Time-Periods; $p < .05$ )+
<b>Brief Resilience Scale</b>					
BRS	[ $F(2, 54) = 8.82, p < .05$ ]	$M = 3.76$ $SD = 0.57$	$M = 3.68$ $SD = 0.57$	$M = 4.11$ $SD = 0.70$	Over time <sup>§</sup> : Yes ( $p = .00$ ) Pre- to mid-: No ( $p = 1.00$ ) Mid- to post: Yes ( $p = .00$ ) Pre- to post: Yes ( $p = .02$ )
<b>Mental Health Inventory</b>					
Total*	[ $F(1.55, 41.91) = 2.20, p > .05$ ]	$M = 72.6$ $SD = 14.6$	$M = 71.2$ $SD = 15.52$	$M = 66.36$ $SD = 9.51$	Over time: No ( $p = .13$ )
Anxiety	[ $F(2, 54) = 0.88, p > .05$ ]	$M = 64.71$ $SD = 18.80$	$M = 60.14$ $SD = 12.30$	$M = 62.29$ $SD = 14.15$	Over time: No ( $p = .42$ )
Depression	[ $F(2, 54) = 0.34, p > .05$ ]	$M = 78.21$ $SD = 15.29$	$M = 76.07$ $SD = 15.48$	$M = 78.93$ $SD = 12.57$	Over time: No ( $p = .72$ )
Behavioural Control	[ $F(2, 54) = 25.44, p < .05$ ]	$M = 78.93$ $SD = 19.21$	$M = 58.21$ $SD = 6.56$	$M = 57.68$ $SD = 10.84$	Over time: Yes ( $p = .00$ ) Pre- to mid-: Yes ( $p = .00$ ) Mid- to post: No ( $p = 1.00$ ) Pre- to post: Yes ( $p = .00$ )
Positive Affect	[ $F(2, 54) = 52.97, p < .05$ ]	$M = 68.75$ $SD = 15.37$	$M = 34.11$ $SD = 16.56$	$M = 33.40$ $SD = 13.34$	Over time: Yes ( $p = .00$ ) Pre- to mid-: Yes ( $p = .00$ ) Mid- to post: No ( $p = 1.00$ ) Pre- to post: Yes ( $p = .00$ )
<b>SF-36</b>					
Physical Functioning*	[ $F(1.07, 28.85) = 0.88, p > .05$ ]	$M = 94.46$ $SD = 17.07$	$M = 97.68$ $SD = 4.19$	$M = 96.50$ $SD = 4.19$	Over time: No ( $p = .36$ )
Role Limitations Due to Physical Health	[ $F(2, 54) = 0.34, p > .05$ ]	$M = 90.18$ $SD = 24.85$	$M = 85.71$ $SD = 25.85$	$M = 86.61$ $SD = 27.62$	Over time: No ( $p = .72$ )
Role Limitations Due to Emotional Health	[ $F(2, 54) = 0.13, p > .05$ ]	$M = 63.10$ $SD = 38.85$	$M = 61.90$ $SD = 40.28$	$M = 65.46$ $SD = 43.99$	Over time: No ( $p = .88$ )
Pain	[ $F(2, 54) = 0.21, p > .05$ ]	$M = 83.48$ $SD = 15.37$	$M = 83.48$ $SD = 16.74$	$M = 85.25$ $SD = 15.60$	Over time: No ( $p = .81$ )
Energy & Fatigue*	[ $F(1.62, 43.67) = 0.00, p > .05$ ]	$M = 61.43$ $SD = 14.96$	$M = 61.25$ $SD = 16.37$	$M = 61.25$ $SD = 17.41$	Over time: No ( $p = .99$ )
Emotional Well-Being*	[ $F(1.65, 44.51) = 0.57, p > .05$ ]	$M = 74.29$ $SD = 15.60$	$M = 73.43$ $SD = 17.60$	$M = 76.57$ $SD = 14.10$	Over time: No ( $p = .54$ )
Social Functioning	[ $F(2, 54) = 1.37, p > .05$ ]	$M = 76.79$ $SD = 19.75$	$M = 79.91$ $SD = 21.61$	$M = 83.61$ $SD = 18.37$	Over time: No ( $p = .26$ )
General Health*	[ $F(1.59, 43.05) = 3.31, p > .05$ ]	$M = 79.55$ $SD = 13.19$	$M = 79.82$ $SD = 16.97$	$M = 83.39$ $SD = 13.06$	Over time: No ( $p = .56$ )

**Notes:**

\* Mauchly's test of sphericity was violated; Greenhouse-Geisser correction applied. Adjusted  $p$  values were calculated using adjusted degrees of freedom;  $p < .017$ . +  $p < .05$  unless marked by \*.

§ 'Over time' refers to any differences between related means overall (Laerd Statistics, 2013).

## Qualitative findings from participants

### Mid-intervention

Ethical approval for qualitative interviews was received halfway through first semester, and mentor-protégé teams were not set immediately; therefore, mentors were not interviewed until mid-intervention. Participants were asked questions pertaining to their mentorship experiences, and the relationship they developed with their protégés. At mid-intervention, the following themes emerged: (a) resiliency; (b) symbiotic relationship; (c) life skills; (d) kindness; (e) impact of PA on mental health and resiliency; and (f) added stressors. When asked about the personal impact of being a mentor, the majority of participants described increased resiliency, or their ability to cope with stressful situations. Participants voiced improvements with their health (mental, physical, and overall), and new abilities to cope with their own stressors and anxieties.

Addressing the mentor-protégé relationship, most participants explained a symbiotic relationship. Participants discussed learning from their protégés, versus being the only ones in the relationship to deliver new information (e.g. coping skills, information about services, activities, etc.). Mentors also described their perspective that their relationships were working due to building trusting friendships and sharing what was happening in each other's lives.

All participants articulated improvements with life skills and personal development and communication. Participants verbalized the significance of utilizing active listening skills with their protégés, and being receptive and non-judgmental. Active listening taught mentors to adapt their expectations and accept the relationships they had, versus what they anticipated – they accepted what their protégés needed, and became the mentor their protégés required. Mentors emphasized this by describing that some of their protégés were seeking support for academics or social support, while others were interested in PA, and some had different needs altogether. Through self-reflections, participants described learning new things about themselves, and who they were as mentors. Participants also discussed improved time management skills.

Discussing motivations for joining the study, all participants expressed their desire to extend kindness and “*give back*.” Participants felt they had acquired knowledge throughout their undergraduate experience that would assist first-years. Most participants described not having adequate, or any, access to mental health services/supports when they were in first year, inspiring them to provide first-years with support.

Most participants described PA's importance for health and mental health benefits. Participants highlighted the program's unique approach as a motivator to enroll (i.e., they wanted to help address mental health and resiliency through PA). Participants noted their enrollment in Kinesiology meant they were already engaged in organized sports or exercise; however, SHC emphasized general PA. Thus, most participants noticed increases in their levels of PA, which led them to feel less stressed and better able to cope with their stressors. Participants further reflected this by describing feeling lethargic on days they did not engage in PA.

Despite many positive experiences, the majority of participants vocalized added stressors. These were due to communication issues between mentors and protégés, protégés having different objectives (i.e. personal training) versus the study (i.e. general PA), protégés not getting along with their mentors, protégés dropping out, scheduling issues, not meeting protégés until later in the semester, a lack of mentoring/mentorship guidelines, course-related issues (i.e. not receiving assignment feedback, not knowing grades), and random mentor-protégé groupings (which did not always result in a good match). Table 4 presents quotations that illustrate these themes.



**Table 4. Quotations Supporting Themes from Mid-Intervention**

<b>Resiliency</b>
"I think I've become more patient. Before, in dealing with stress, I'd either let it get to me or I wouldn't handle it well. But, having protégés to keep you accountable for how you deal with things has made me more accountable in other aspects of my life. When I'm feeling stressed out and stuff, I just head to the gym and I get my fix and then I'm fine afterwards...Really the focus of taking a mental break when you are stressed out or when you are studying for countless hours, I've never employed that, ever in my four years until this year. That's been helping me a lot."
<b>Symbiotic Relationship</b>
"What has impacted me? ...Somebody will always have something to teach you, regardless of age. I think that's one thing that I have been able to take away."
<b>Life Skills (Time Management, Social Support, Academic Support, &amp; Communication)</b>
<i>Time Management</i>
"I feel like I'm organizing my time so that like I am able to talk to them whenever they need to, and I'm like always available."
<i>Social Support</i>
"...the biggest thing is being a person that's willing to listen...it's more of having that person just to talk about whatever, and to have that relationship there, rather than just being like a workout buddy or whatnot."
<i>Academic Support</i>
"I find I'm helping more with academics than I am with athletics. They come to me for more school stuff."
<i>Communication</i>
"...open communication has helped a lot. They're super open in asking questions, and I feel like it's forcing me to think about certain things and actually express that, like communicating to them...I always find that I keep a lot of things to myself, but with them I feel like I'm opening up more."
<b>Kindness</b>
"Honestly, my biggest factor is the degree that I struggled in first year, I struggled immensely, more than I ever thought I would coming to university... If I could help even one student avoid the experience I had in first year, then that would be incredible."
<b>Impact of PA on Mental Health &amp; Resiliency</b>
"And I feel like maybe that mental resiliency is correlated with the amount of physical activity I'm getting...and this exam period has been very stressful, but we still are going to the gym and getting up in the morning, and I feel better. I feel...a lot better. I don't know...it's not very much different, but I just feel better."
<b>Added Stressors</b>
"...it just kind of stresses me out...Is my mark going to be bad because I haven't done anything with [my protégé]? And then occasionally making the time to work out once or a couple times a week is stressful just because you have to work around their schedule. I'm not used to...working around other people's schedules; and just putting them first can be stressful if you're busy...&rdquo>

## Post-intervention

Immediately post-intervention, participants were asked questions pertaining to their overall experiences, and if/how the mentorship experience impacted their own levels of mental health, resiliency, and PA. Five themes were identified: (a) increased resiliency (increased coping and stress-management); (b) increased PA and new perspectives about PA; (c) personal growth (self-reflection & self-awareness, skill development [communication, active listening, leadership]; pushing boundaries [new activities, moving outside of comfort zone]); (d) social support (sense of community, connection, and friendship; invested in others [what protégés need and want, rewarding to see protégés grow and succeed; advocating for mental health awareness]; symbiotic relationship; and (e) added stressors.

Compared to the beginning of the study, the majority of participants noted increases in their levels of resiliency and PA. Participants described garnering new tools/life skills, which helped with coping and stress-management. With respect to PA, most participants described increased engagement, whether it was with their protégés, on their own, or combined. Further, the majority of participants discussed their new-found ability to view PA from new perspectives (e.g. versus regimented exercise, learning to engage in PA when injured and/or ill).

All participants vocalized personal growth by learning how to self-reflect, thereby increasing self-awareness; as well as through learning new skills from the LET seminar, such as communication, listening, and leadership skills<sup>[2]</sup>. Further discussing PA, almost all participants described how mentorship taught them to push boundaries through participating in new activities – either because their protégés wanted to, or because the mentor-protégé group wanted to try something new as a team – and learned to move outside of their comfort zones to bond with their protégés.

Most participants articulated feelings of comradery, with respect to befriending their protégés and other mentors, and feeling more connected to their faculty. All participants communicated their desire to help first-years, and that it was rewarding to witness their protégés learn and grow.

Further, all participants emphasized the importance of mental health advocacy, and the positive experiences they had helping their protégés with supports/services, as well as helping via PA and being a good listener.

Although the objective of the study was for mentors to help their protégés, almost all of the participants noted symbiosis, such that the mentors and protégés learned from and helped each other. As mirrored in the mid-intervention interviews, all participants articulated stressors attached to the process of being a mentor. The same program-related stressors voiced at mid-intervention were verbalized at post-intervention (see above). Table 5 provides illustrative quotations.

**Table 5 Quotations Supporting Themes from Post-Intervention**

<b>Increased Resiliency (Coping &amp; Stress-Management)</b>
"...to come out of this and say that because of this project, it pushed me – it really did push me to go do all the things that I could not physically do because of how anxious it made me. But, it's definitely made me such a stronger person...I feel so ready to kind of take on the next couple of years without worrying so much about all of the things that I worried about before."
<b>Physical Activity (Increased PA, New Perspectives About PA)</b>
"...I learned a lot about how to incorporate activity in a way that was sustainable for life."
<b>Personal Growth (Self-Reflection &amp; Self-Awareness, Skill Development [Communication, Active Listening, Leadership]; Pushing Boundaries [New Activities, Moving Outside of Comfort Zone])</b>
<i>Self-Reflection &amp; Self-Awareness</i>
"And that's what's good through the mentorship-protégé [relationship], we all had a lot of self-growth...I think that was an important aspect of being a mentor. We had a lot of self-growth on our own apart from our protégés, which I think helped us as mentors, as well, in the end."
<i>Skill Development (Communication, Active Listening, Leadership)</i>
"...the program's been very great...It's getting to be pretty impactful as it speaks to those soft skills, not just those hard skills we learn in school."
<i>Pushing Boundaries [New Activities, Moving Outside of Comfort Zone]</i>
"...just being able to get outside of your comfort zone and...not only in terms of physical activity, but if you can get outside of your comfort zone and do different classes, do stuff you normally wouldn't do, then that can translate over to other aspects of your life, as well. In terms of being more resilient and just not being afraid to take risks..."
<b>Social Support (Sense of Community, Connection, and Friendship; Invested in Others [What protégés need and want, rewarding to see protégés grow and succeed; advocating for mental health awareness]; Symbiotic Relationship)</b>
<i>Sense of Community, Connection, and Friendship</i>
"...it brought me together with my peers even more so than before in the last four years of Kin, so it was a great support network to have."
<i>Invested in Others [What protégés need and want, rewarding to see protégés grow and succeed; advocating for mental health awareness]</i>
"I saw the impact on my protégé's life...it's not just a course, this was something that truly was life-changing..."
<i>Symbiotic Relationship</i>
"I thought mentoring was very one-way, like they'll be benefitting [from it], they'll develop new skills, learn about themselves, and work on leadership characteristics; but, I didn't know how much I guess it would impact me..."
<b>Added Stressors</b>
"...a lot of the times things were really up in the air, especially when it came to our marks, not knowing what our marks were...it was pretty stressful considering it was a full-year course, and being in fourth year...I was kind of freaking out about that, and just a lot of the ways the course is set up, not everything was set in stone."

## Discussion

The study's purpose was to explore senior Kinesiology students' (mentors) psychosocial experiences in an undergraduate course focused on building resilience amongst first-years via PA and mentorship.

Overall, the results of this study revealed few, albeit desirable, statistically significant findings pertaining to participants' perceived levels of resilience, behavioural control, and positive affect over the course of the program. Qualitatively, participants found being a mentor to be a rewarding experience in general, although some challenges to the role were also noted, as discussed below. A main finding was that mentors reported a significant increase in resilience (BRS) over time, indicating that although the course was intended to benefit first-years, mentors themselves became more resilient, and therefore better able to address adverse events during their academic year. At post-intervention, mentors reported an average BRS score that was slightly higher than two samples of undergraduate students in southwestern USA ( $n = 128$ ; Smith et al., 2008). Thus, these findings are consistent with reported undergraduate norms (Smith et al., 2008), although the slight increases in resiliency may also indicate the positive effects gained from acting as a mentor, as has been highlighted in previous bodies of literature (Allen et al., 1997; Durham

University, 2017; Grima et al., 2014; Kram, 1983; Ragins & Scandura, 1999; Zey, 1984; Zimmerman & Bingenheimer, 2002).

Results from the MHI showed no significant differences over time in anxiety, depression, or overall, suggesting mentors' mental health functioning did not change. Interestingly, the MHI *behavioural control* and *positive affect* subscales significantly *decreased* over time, indicating participants experienced a reduced level of functioning in these areas. At post-intervention, mentors reported a mean that is just slightly lower than the mean score from an undergraduate sample ( $n = 604$ ) in Midwest USA (Hartley, 2011). This could indicate that although mental health functioning seemed to decrease in some areas, results from this study are consistent with undergraduate norms. It is possible that the added stressors experienced by the mentors may have caused the significant decreases in these areas. Further, quantitative assessments were distributed during exam seasons (i.e. midterms and finals), which are typically times when students experience high and increased levels of stress. Thus, it is possible that completing the measurements during these time periods may have skewed the results.

None of the SF-36 subscales significantly changed over time. This could indicate that participants did not experience a change in physical functioning, role limitations due to physical or emotional health, pain, energy and fatigue, emotional well-being, social functioning, or overall general health at various points throughout the program. While an aim of the program was to engage in– and therefore increase – PA, most of the mentors noted already being very physically active due to being in the Kinesiology program; and although levels of PA did increase among the mentors, it may not have been enough to produce any statistically significant changes. Further, several mentors incurred injuries or health issues that prevented them from engaging in PA, also potentially hindering any significant changes.

Qualitative assessments were not consistent with quantitative findings, in that most participants reported improvements in stress and anxiety, PA, and resiliency. Participation in this study seemed to result in life skill development and personal growth. It was also reported that mentors better understood the impact of PA on mental health and resiliency, and experienced improvements in dealing with adverse events through PA, which is consistent with previous literature regarding the benefits of PA for mental health in university settings (Tyson, Wilson, Crone, Brailsford, & Laws, 2010). Mentors felt they benefitted from having a protégé as much as, or perhaps even more, than their protégés did. The mentorship role, coupled with regular PA, appeared to support mentors' improved resiliency and the ability to deal with stressors. It is clear that the role of mentorship is beneficial for the student serving as a mentor. This finding is consistent with other mentor-related research, where results were indicative of the benefits gained from being a mentor (Allen et al., 1997; Durham University, 2017; Grima et al., 2014; Kram, 1983; Ragins & Scandura, 1999; Zey, 1984; Zimmerman & Bingenheimer, 2002).

Although most mentors did express positive, and mutually beneficial, experiences with their protégés, some indicated the program was not what they expected, and became an added stressor. They explained that having a protégé resulted in greater stress, especially when there were differing values, or lack of communication, between mentor and protégé. These situations are inherent in mentor-protégé pairings, as people's differences may prevent the formation of meaningful relationships. Further, because this was a pilot course, it not clear how any course-related issues influenced the learning and resilience of the mentors, whether positively or negatively.

The researchers posit that the mixed findings may be due, in part, to not being able to use all collected data, such that some scales require at least 50% completion (Ware, Kosinski, & Gandek, 2003) – and one participant did not adhere to this – to be utilized for analysis (e.g. SF-36). Participants who did not complete the required amount of questions were excluded from data analysis, as a repeated-measures design requires each participant to act as their own control. Further, scoring manuals for the scales used in this study indicate the best results come from using a population of 30 to 60 participants. Given that these scales are psychometrically sound, a larger population is needed to conclusively state whether or not this type of intervention is able to produce statistically significant changes in its favour. Additionally, the majority of participants in the study were female, who tend to report higher rates of mental health issues compared to males (Statistics Canada, 2015).

## Limitations

The first limitation was the potential self-selection bias inherent in research studies of this nature (i.e. it is not possible to differentiate between those who consented with those who did not enroll in the course). Additional limitations were: (a) the small sample size and inability to use all 30 participants for quantitative analyses, affecting the ability to detect statistically significant results; (b) components of the intervention require time (i.e. building trust); (c) mentor-protégé groups were randomly assigned, meaning not all groups were a good fit; (d) data collection occurred during exams, potentially affecting questionnaire responses due to exam stress; (e) several mentors were injured (e.g. concussions), which hindered not only increased levels of PA, but sometimes *any* engagement in PA due to restrictions and limitations dictated by the injury; and further, when protégés were injured, their mentors did not engage in any PA beyond what they were already doing; (f) mentors were enrolled in the Kinesiology program – and some were varsity athletes – and stated that they were already very physically active, and did not always have the time or desire to engage in any additional PA; and (g) added stressors experienced by the mentors as a result of the program being new, such that the mentors were not only focused on being a good mentor and having a positive impact on their projects, but they were also very concerned with their performance with respect to their course grade.

## Conclusions

Cogitating on the limitations, this pilot study proved promising. Participants' positive experiences outlined the beneficial nature of a mentorship- and PA-based intervention for university students to improve mental health and build resiliency. By participating in this study, the mentors, themselves, experienced PA-, mental health-, and resiliency-related benefits. The findings from this study, albeit mixed (with respect to the statistical findings), further emphasized promising outcomes from previous studies, wherein PA and mentorship were utilized as interventions to enhance resiliency (Hegberg & Tone, 2015; Zimmerman & Bingenheimer, 2002). A mentorship approach should be explored further in both larger-scale and longer-term studies, and should include the additional element of PA.

## Future Implications

It should be noted that this pilot study represents only the first cohort of mentors involved in the program. The SHC project is occurring in “waves” and enrolls new students every academic year. Feedback from the first experience have been incorporated into current offerings, and future research on the program may have access to a larger group of participants. Furthermore, future work in this area could be expanded by conducting longitudinal studies observing participants throughout the course of their degree (i.e. over four-years), to detect the efficacy of this type of intervention, and differences that may arise throughout the years (e.g. what are the effects on protégés who become mentors?). The researchers recommend assessing other universities to assess differences among other populations, as well as to add to the limited body of literature that exists surrounding university students and PA-related interventions. Ideally, it is anticipated that results from future studies will help inform policies and practices aimed at prioritizing student mental health from their first day at university.

## Acknowledgements

Dr. Kevin Shoemaker and the Smart Healthy Campus Initiative, Arlene Fleishhauer, Brad Matuszewski, & Paulina Bond

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[1] For information about the first years (i.e. protégés) from this program, refer to Gable & Meisner (currently underway)

[2] Refer to Gable & Meisner (currently underway)

## References

- Allen, T. D., Poteet, M. L. and Burroughs, S. M. (1997) 'The mentor's perspective: A qualitative inquiry and future research agenda', *Journal of Vocational Behavior*, 5(1), pp.70-89.
- American College Health Association (2013) *American college health association-national college health assessment II: Western university executive summary spring 2013*. Hanover, MD: American College Health Association, pp.1-17.
- American College Health Association (2016) *American college health association-national college health assessment II: Ontario Canada reference group executive summary spring 2016*. Hanover, MD: American College Health Association, pp.1-19.
- American Psychological Association (2018) *The road to resilience*. Available at: <http://www.apa.org/helpcenter/road-resilience.aspx>.
- Bates, B. (1992) 'The effect of demands for honesty on the efficacy of the Carleton Skills-Training Program', *International Journal of Clinical and Experimental Hypnosis*, 40(2), pp.88-102. DOI: 10.1080/00207149208409650.
- Brazier, J. E., Harper, R., Jones, N. M. and , et al (1992) 'Validating the SF-36 health survey questionnaire: New outcome measure for primary care', *British Medical Journal*, 305(6846), pp.160-164. DOI: 10.1136/bmj.305.6846.160.
- Buckworth, J. and Nigg, C. (2004) 'Physical activity, exercise, and sedentary behavior in college students', *Journal of American College Health*, 53(1), pp.28-34. DOI: 10.3200/JACH.53.1.28-34.
- Cameron, R. (2011) 'Mixed methods research: The five Ps framework', *The Electronic Journal of Business Research Methods*, 9(2), pp.96-108.
- Canadian Institute For Health Information (2015) *Many more young Canadians using health services for mental disorders*. Available at: <https://www.cihi.ca/en/types-of-care/specialized-services/mental-health-and-addictions/many-more-young-canadians-using>.
- Centre for Addiction and Mental Health (2012) *Understanding resilience*. Available at: [http://www.camh.ca/en/education/teachers\\_school\\_programs/resources\\_for\\_teachers\\_and\\_schools/growing\\_up\\_resilient\\_ways\\_to\\_build\\_resilience\\_in\\_children\\_and\\_youth/Pages/understanding\\_resilience.aspx](http://www.camh.ca/en/education/teachers_school_programs/resources_for_teachers_and_schools/growing_up_resilient_ways_to_build_resilience_in_children_and_youth/Pages/understanding_resilience.aspx).
- Council of Ontario Universities (2017) *In it together: Taking action on student mental health*. Available at: <http://cou.on.ca/reports/in-it-together/>.
- Dogra, S., MacIntosh, L., O'Neill, C. and , et al (2017) 'The association of physical activity with depression and stress among post-secondary school students: A systematic review', *Mental Health and Physical Activity*, pp.1-11. DOI: 10.1016/j.mhpa.2017.11.001.
- Durham University (2017) *What are the benefits of mentoring?*. Available at: <https://www.dur.ac.uk/hr/mentoring/mentoringguidelines/mentoringbenefits/>.
- Feilzer, M. Y. (2010) 'Implications for the rediscovery of pragmatism as a research paradigm', *Journal of Mixed Methods Research*, 4(1), pp.6-16. DOI: 10.1177/1558689809349691.
- Feinstein, L., Sabates, R., Anderson, T. M., Sorhaindo, A. and Hammond, C. (2006) *What are the effects of education on health? Measuring the effects of education on health and civic engagement. Proceedings of the Copenhagen Symposium. Social Outcome of Learning Project Symposium, 23-24 May 2006, Copenhagen*. Available at: <https://www1.oecd.org/edu/innovation-education/37425753.pdf>.
- Garratt, A. M., Ruta, D. A., Abdalla, M. I. and Russell, I. T. (1994) 'SF-36 health survey questionnaire: II. Responsiveness to changes in health status in four common clinical conditions', *Quality In Health Care*, 3(4), pp.186-192.
- Gordon, T. (2001) *Leadership Effectiveness Training (L.E.T.): The proven model for helping leaders bring out the best in their people* (35th anniversary edn.). New York: The Berkely Publishing Grp.
- Grima, F., Paillé, P., Mejia, J. H. and Prud'homme, L. (2014) 'Exploring the benefits of mentoring activities for the mentor', *Career Development International*, 19(4), pp.469-490.
- Guba, E. G. and Lincoln, Y. S. (1989) *Fourth generation evaluation*. Newbury Park, CA: Sage Publications.
- Hall, K. (2017) *University Students' Council standing policy on mental health at Western University*. Available at: <https://westernusc.ca/wp-content/uploads/2017/01/Mental-Health-Paper.pdf>.
- Harbour, V. J., Behrens, T. K., Kim, H. S. and Kitchens, C. L. (2008) 'Vigorous physical activity and depressive symptoms in college students', *Journal of Physical Activity & Health*, 5(4), pp.516-526. DOI: 10.1123/jpah.5.4.516.
- Hartley, M. T. (2011) 'Examining the relationships between resilience, mental health, and academic persistence in undergraduate college students', *Journal of American College Health*, 59(7), pp.596-604.
- Hegberg, N. J. and Tone, E. B. (2015) 'Physical activity and stress resilience: Considering those at-risk for developing mental health problems', *Mental Health and Physical Activity*, 8, pp.1-7. DOI: 10.1016/j.mhpa.2014.10.001.
- Irwin, J. D. (2007) 'The prevalence of physical activity maintenance in a sample of university students: a longitudinal study', *Journal of American College Health*, 56(1), pp.37-41.
- Jenkinson, C., Coulter, A. and Wright, L. (1993) 'Short form 36 (SF36) health survey questionnaire: Normative data for adults of working age', *British Medical Journal*, 306(6890), pp.1437-1440. DOI: 10.1136/bmj.306.6890.1437.

- Jenkinson, K. A., Naughton, G. and Benson, A. C. (2012) 'The GLAMA (Girls! Lead! Achieve! Mentor! Activate!) physical activity and peer leadership intervention pilot project: A process evaluation using the RE-AIM framework', *BMC Public Health*, 12(55). DOI: 10.1186/1471-2458-12-55.
- Kieffer, K. M. (2002) 'On analyzing repeated measures designs with both univariate and multivariate methods: A primer with examples', *Multiple Linear Regression Viewpoints*, 28(1), pp.1-16.
- Kram, K. E. (1983) 'Phases of the mentor relationship', *The Academy of Management Journal*, 26(4), pp.608-625. DOI: 10.2307/255910.
- Laerd Statistics (2013) *Repeated measures ANOVA*. Available at: <https://statistics.laerd.com/statistical-guides/repeated-measures-anova-statistical-guide.php>.
- Mental Health Commission of Canada (2016) *Peer support*. Available at: <http://www.mentalhealthcommission.ca/English/focus-areas/peer-support>.
- Mikkonen, J. and Raphael, D. (2010) *Social determinants of health: The Canadian facts*. Toronto: York University School of Health Policy and Management.
- Miller, W. R. and Rollnick, S. (2002) *Motivational Interviewing: Preparing People for Change* (2nd edn.). New York: The Guilford Press.
- Moulin, M. S. and Irwin, J. D. (2017) 'An assessment of sedentary time among undergraduate students at a Canadian University', *International Journal of Exercise Science*, 10(8), pp.1116-1129. Available at: <https://digitalcommons.wku.edu/ijes/vol10/iss8/3>.
- Nabkasorn, C., Miyai, N., Sootmongkol, A. and , et al (2006) 'Effects of physical exercise on depression, neuroendocrine stress hormones and physiological fitness in adolescent females with depressive symptoms', *European Journal of Public Health*, 16(2), pp.179-184. DOI: 10.1093/eurpub/cki159.
- National Multiple Sclerosis Society (1997) *Multiple sclerosis quality of life inventory (MSQLI): A user's manual*. Available at: [https://www.nationalmssociety.org/NationalMSSociety/media/MSNationalFiles/Brochures/MSQLI\\_-\\_A-User-s-Manual.pdf](https://www.nationalmssociety.org/NationalMSSociety/media/MSNationalFiles/Brochures/MSQLI_-_A-User-s-Manual.pdf).
- Ontario's Universities (2018) *Partnering on student mental health*. Available at: <http://ontariosuniversities.ca/issues-priorities/student-supports/>.
- Patton, M. Q. (2002) *Qualitative research & evaluation methods* (3rd edn.). London, UK: Sage.
- Ragins, B. R. and Scandura, T. A. (1999) 'Burden or blessing? Expected costs and benefits of being a mentor', *Journal of Organizational Behaviour*, 20(4), pp.493-509. Available at: <http://www.jstor.org/stable/3100386>.
- RAND (2018) *36-item short form survey (SF-36) scoring instructions*. Available at: [https://www.rand.org/health/surveys\\_tools/mos/36-item-short-form/scoring.html](https://www.rand.org/health/surveys_tools/mos/36-item-short-form/scoring.html).
- Ribeiro, I. J. S., Pereira, R. , Freire, I. V. and , et al (2017) 'Stress and quality of life among university students: A systematic literature review', *Health Professions Education*, pp.1-8. DOI: 10.1016/j.hpe.2017.03.002.
- Shannon-Baker, P. (2016) 'Making paradigms meaningful in mixed methods research', *Journal of Mixed Methods Research*, 10(4), pp.319-334. DOI: 10.1177/1558689815575861.
- Smith, B., Dalen, J. , Wiggins, K. and , et al (2008) 'The brief resilience scale: Assessing the ability to bounce back', *International Journal of Behavioral Medicine*, 15(3), pp.194-200.
- Statistics Canada (2015) *Mood and anxiety disorders*. Available at: <https://www.statcan.gc.ca/pub/89-503-x/2010001/article/11543-eng.htm>.
- Stathopoulou, G., Powers, M. B., Berry, A. C. and , et al (2006) 'Exercise interventions for mental health: A quantitative and qualitative review', *Clinical Psychology: Science and Practice*, 13(2), pp.179-193. DOI: 10.1111/j.1468-2850.2006.00021.x.
- Taliaferro, L. A., Rienzo, B. A., Pigg, R. M. Jr. and , et al (2009) 'Associations between physical activity and reduced rates of hopelessness, depression, and suicidal behavior among college students', *Journal of American College Health*, 57(4), pp.427-436. DOI: 10.3200/JACH.57.4.427-436.
- Tyson, P., Wilson, K., Crone, D. and , et al (2010) 'Physical activity and mental health in a student population', *Journal of Mental Health*, 19(6), pp.492-499. DOI: 10.3109/09638230902968308 .
- Veit, C. T. and Ware, J. E. Jr. (1983) 'The structure of psychological distress and well-being in general populations', *Journal of Consulting and Clinical Psychology*, 51(5), pp.730-742.
- (1997) *Children and youth: Interdisciplinary perspectives*. Thousand Oaks, CA: Sage Publications..
- Ware, J. E. Jr., Kosinski, M. and Gandek, B. (2003) *SF-36 health survey: Manual & interpretation guide*. Lincoln, RI: QualityMetric Incorporated.
- Windle, G., Bennett, K. M. and Noyes, J. (2011) 'A methodological review of resilience measurement scales', *Health and Quality of Life Outcomes*, 9(1), pp.1-18. DOI: 10.1186/1477-7525-9-8.
- World Health Organization (1998) *Health promoting universities: Concept, experience and framework for action*. Copenhagen, Denmark: Health Documentation Services WHO Regional Office for Europe. .

World Health Organization (2003) *Investing in mental health*. Available at:  
[http://www.who.int/mental\\_health/media/investing\\_mnh.pdf](http://www.who.int/mental_health/media/investing_mnh.pdf).

Zey, M. G. (1984) *The mentor connection*. Homewood, IL: Dow Jones-Irwin.

Zimmerman, M. A. and Bingenheimer, J. B. (2002) 'Natural mentors and adolescent resiliency: A study with urban youth', *American Journal of Community Psychology*, 30(2), pp.221-243.

## About the authors

**Rebecca R. Fried**, a fourth-year PhD student and Certified Professional Co-Active Coach, researches motivational interviewing, mentoring and physical activity, with respect to stress/anxiety, and resiliency.

**Shazya Karmali**, a third-year PhD student, researches understanding the efficacy of parent-child physical activity and nutrition interventions to encourage family-based lifestyle changes.

**Dr. Jennifer D. Irwin**, an Associate Professor in the Faculty of Health Sciences and a Certified Professional Co-Active Coach, researches motivational interviewing on health-related behaviours.

**Francesca L. Gable**, a second-year Master's student, focuses on the informal role of sport and physical activity in developing mentor-protégé relationships aimed at building resilience.

**Dr. Alan Salmoni**, a Professor in Kinesiology, researches several interdisciplinary areas, including aging and ergonomics, often combining them conceptually and methodologically (e.g. falls in seniors).