Job satisfaction in sport science and sports medicine, an international cross-sectional survey

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ABSTRACT

Background/Aim Job satisfaction (JS) and professional burnout among health professionals have been shown to affect several factors: healthcare quality, patient safety, patient satisfaction, turnover/reduction of work effort, healthcare costs and other personal consequences. In general, factors that impact JS for health professionals include professional autonomy, workplace conditions, rewards/recognition, compensation and work–life balance. However, less is known about JS of professions working in sport science and sports medicine (SSSM) especially from an international perspective. This paper addresses JS among SSSM professionals in an international context.

Methods In a cross-sectional study design, the Interprofessional Collaboration (IPC) in SSSM survey, an online survey which included the Warr-Cook-Wall JS questionnaire for international respondents working in fields associated with SSSM, was distributed globally to persons working in SSSM. Data from 320 respondents with complete data sets from USA (n=83), Canada (n=179) and Europe (n=58) were collected.

Results High values were detected in the overall JS of the total sample with some differences in variables relevant for JS internationally and a relationship between positive perceptions of IPC and overall JS. The most important determinant for overall JS in professionals working in SSSM is the opportunity to use abilities.

Conclusion JS has an important influence on the work and services provided by SSSM professionals and experience with IPC can have a positive effect on JS which, in turn, can improve quality of life for clients, patients and professionals. Employers should regard most impactful determinants of overall JS when designing working conditions for their employees.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Job satisfaction and burnout among sport science and sports medicine professionals impact patient and clients and are affected by factors of professional autonomy, workplace conditions, rewards/recognition, compensation and work-life balance.

WHAT THIS STUDY ADDS

⇒ Internationally, job satisfaction among sport science and sports medicine professionals is generally good but differs by region and has a positive relationship with interprofessional collaboration experience.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Job satisfaction is an essential consideration in clinical practice; addressing contextual factors and intentional interprofessional engagement are keys to enhancing job satisfaction.

turnover and reduction of work effort; healthcare costs and other personal consequences. The ‘Triple Aim’, which looks to enhance the patient experience, improve health of the population and reduce healthcare costs has been recognised as a framework for system improvement. This has been expanded to a ‘Quadruple Aim’ to also include the goal of improving the work–life of healthcare clinicians and staff.

Most of the research around health professions concerning job satisfaction (JS) are physicians and nurses, however, less is known about JS of professions working in sport science and sports medicine (SSSM) especially from an international perspective. Sports medicine, while not a discrete profession in itself, exists within many professions who must work together to deliver care in a unique and highly visible context. Sports science professionals are similarly challenged regarding their ‘fit’ on these healthcare teams. This paper addresses JS among SSSM professionals in an international context.

Careers in the health professions can be rewarding and impactful. Health professionals are often the most highly trusted individuals and they are some of the most in demand programmes at universities and colleges. However, professional practice also comes with levels of stress and burden. Professional ‘burnout’ characterised by emotional exhaustion, cynicism and diminished sense of accomplishment from work has become prevalent among health professionals. Burnout has been shown to affect: healthcare quality and patient safety; patient satisfaction;
BACKGROUND

Theoretical Foundation

There are several widely accepted theories that contribute to JS. Bandura’s social-cognitive theory provides a agentic perspective where people are proactive regulators of their motivation and actions. This theory is based around a concept of self-efficacy where individual expectations of personal efficacy will activate coping behaviours, relative amount of work expended and willingness to sustain that work in the face of adverse experiences. Expectations of personal efficacy are based on their personal psychological state, interactions with others as well as experience of success in the work.

Based on Bandura’s work, Locke and Latham developed the goal setting theory suggesting that satisfaction results from setting specific, difficult goals and those relationship of goals to affect their work. With regards to JS, the goal setting theory identifies several intrinsic moderators, goal commitment and self-efficacy, along with extrinsic moderators such as feedback and task complexity.

The conservation of resources (COR) theory is a resource-oriented model and is based on the supposition that people strive to retain, protect and build resources and that what is threatening to them is the potential or actual loss of these valued resources. JS and professional identity can be affected because workplace stressors provide threats to these resources. They are affected by perceived role in a specific culture/context as well as the objective circumstances of their job or work.

Job satisfaction and health professionals

Recruitment and retention of health professionals have been prioritised across healthcare systems. In view of the shortage of healthcare workers in many countries, for example, Germany and Switzerland, JS in healthcare professions is an important factor impacting recruitment and retention among providers. Additionally, JS of healthcare professions can influence the quality of care in the healthcare system.

Studies have shown that some healthcare professions have a high workload and feel that their work is not very appreciated. High workloads can reduce patient safety, and low JS can be associated with increased staff turnover, more frequent absences from work and associated higher costs and poorer clinical outcomes. Due to the importance of JS on the performance of professionals and the healthcare system, JS has been assessed in several studies in different healthcare professions. Strategies are needed to improve JS and the attractiveness of job profiles in some healthcare professions.

Role clarity and role ambiguity have also found to be factors in JS. An inverse relationship exists between these factors where high role clarity leads to low role ambiguity and vice versa. Research with practising nurses found role clarity was a moderating effect on JS when combined with high social support from supervisors and peers. A study of physiotherapists in Australia found that increased JS was associated with practice ownership, salary satisfaction, established career pathways and access to mentoring and professional development. JS closely related to quality of life factors outside of work among physiotherapists. Research has stated that new physiotherapy graduates are underprepared for work and modifications to the delivery of peer support, mentoring and professional development are required.

JS in sports medicine

There is a body of literature in sports medicine regarding JS and burnout with most of this research occurring around in the USA around athletic trainers. Giacobbi found that depersonalisation, personal accomplishment and emotional exhaustion were factors in burnout. Pitney emphasised that professional responsibility requires a holistic approach consisting of a cycle of respect, rewards and rejuvenation. Terranova and Henning identified multiple workplace issues as key factors in JS for athletic trainers. These issues were also studied by Eason and colleagues in 2015. Barriers to professional commitment include cultural, structural and personal factors.

Eason, Mazeroelle and colleagues have proposed a multi-level model for JS among athletic trainers. This model identifies sociocultural, organisational and individual factors, which influence the work-life interface which in turn produces outcomes at the individual, organisational and sociocultural levels. Data suggest that female athletic trainers report greater levels of burnout than males.

These factors are consistent with the theoretical constructs presented around individual factors such as self-efficacy, goal setting and the impact of stress on resources and perceived professional role. This is especially important in sports medicine because of the wide diversity of professions that work in the field, which gets wider when examined through an international lens. The title ‘Athletic Trainer’ has been under specific scrutiny, because many feel that it does not accurately describe the breadth of their professional training and leads to role ambiguity, stereotyping and limited opportunities within the greater healthcare system.

The title ‘Athletic Therapist’ has been recently adopted in Ireland and Canada.

This study assesses JS among professionals in SSSM in an international context and also explores the impact of demographic factors. It is hoped that the results of this study can enhance JS, resilience and retention among health professionals in SSSM.

METHODS

Survey development and validation

The paper is part of a larger cross-sectional study which surveyed professionals in SSSM regarding sociodemographics as well as Interprofessional Collaboration (IPC) and Interprofessional Education (IPE) in an international context. The authors of this paper developed the IPC in SSSM (IPC-SSSM) survey, which had four parts:
(1) sociodemographic information; (2) attitudes and perceptions of IPC and IPE (University of West of England IP Questionnaire—UWE-IP) 42–44; (3) Warr-Cook-Wall (WCW) JS questionnaire 45 and (4) open-ended questions. The open-ended questions are not reported in this paper, but rather a previous paper published from this research. 8 Prior to survey dissemination, the IPC-SSSM instrument was reviewed for face validity and cultural appropriateness through content analysis by 12 experts in SSSM in eight countries from the authors’ personal network: USA, Canada, Ireland, Spain, United Kingdom, Switzerland, Germany and Sweden. Especially, we asked the experts, if questions and instruments were appropriate for the topic and clear to understand as well as if some essential questions, instruments or items on the topic were missing. As a result of this validation, some minor edits were conducted to support understandability, and a definition of IPC was given at the beginning of the survey.

A modified version of the WCW scale 45,46 with a total of 10 items was used to measure JS. Different versions of this scale in various populations were used in the literature, and this makes it difficult to cite clear psychometrics of the WCW scale. However, the 10-item WCW version is a wide-used one especially when investigating populations working in healthcare. 47,48 Studies showed sufficient reliability (α=0.74 to 0.89) in a British population of the original work 45 as well as in pharmacists and general practitioners. 46 In general, it is concluded that the WCW JS scale provides a short, reliable, valid and easy to use measure of JS. 46 On this 10-item WCW scale used here, nine aspects of JS (physical working conditions, freedom of working methods, colleagues and fellow workers, recognition for work, amount of responsibility, rate of pay, opportunity to use abilities, hours of work and amount of variety in work) as well as the overall JS were assessed. The respective items were scored on a Likert scale with ratings from 1 (extremely dissatisfied) to 7 (extremely satisfied), with higher scores indicating higher satisfaction. The WCW scale has previously been used in various areas of healthcare and is considered an appropriate instrument in these areas. 19,22–24

Public and patient involvement
Since this survey focused on SSSM professionals, the public and patients were not directly involved in this study. However, the investigators have a significant amount of experience in teaching and patient care which informed the development of the project. Additionally, the peer review process for the development of the survey instrument and its dissemination brought in public perspectives.

Recruitment of participants
The investigators decided to use English as the primary language in the survey which was disseminated internationally. Subjects were invited to take part in the IPC-SSSM through: (1) email to professional organisation members where the investigators are affiliated (Swiss Society of Sports Science, German Society of Sport Science, German Sports Physicians Association, European College of Sport Science, American College of Sports Medicine, World Federation of Athletic Training and Therapy, Canadian Athletic Therapists Association and National Athletic Trainers’ Association); (2) email directly to colleagues in researchers’ professional networks and (3) through social media on Twitter, Facebook, Xing and LinkedIn electronically. Participation was voluntary and subjects could withdraw at any time. The IPC-SSSM and Recruitment Statement were administered electronically through the survey platform Qualtrics. No identifying data were recorded on survey participants. Multiple participation was controlled by recording participants’ IP addresses. All subjects self-identified as SSSM professionals and stated they were 18 years or older. As we did not control the number of survey recipients, we can not give any response rate data. We received 420 data sets worldwide. As we focused on specific regions, from initial 359 respondents, 320 complete data sets from USA (n=83), Canada (n=179) and Europe (n=58) were available (89% completion rate). After 11 weeks of acquisition, data were downloaded from Qualtrics and edited with SPSS (IBM SPSS V.27.0). The UWE-IP questionnaire was included in the survey, but its analysis is part of another paper. 8 We tried to reduce non-response error by the following strategies: short and easy to understand survey, introductory e-mail including facts and information about the survey, sufficient time frame for participation in the survey, mainly use of closed-ended questions like Likert scales and multiple-choice questions.

Sociodemographic variables
Sociodemographic characteristics data (eg, gender, age, hours of work per week, type of employment and years of professional experience in SSSM) were obtained during the online survey. Three questions on self-identified profession(s); number of professions regularly interacting in their daily working routine; professional role with multiple response possibilities were included. In the first question, presented respondents with a list of professions and they were asked to select all those that best describe their professional activity. The responses to these questions regarding specific professions are listed by region in Table 1. The second question was designed to discover with which and how many professions the participants regularly interact in their daily working routine. The third question asked their professional role with multiple response possibilities, where participants were asked to choose whether they work as a clinician, an educator, a researcher, an administrator, a technician or whether they would perform several professional roles simultaneously. Additionally, questions on personal experience with IPE in one’s own education and whether personal experience with IP collaborative practice yielded a positive or a negative impact on patient/client outcomes.
The results of this survey align with the theoretical frameworks around self-efficacy, goal setting and COR. They supported the importance of interpersonal communication and teamwork (IPE) and interprofessional collaboration (IPC) in improving patient/customer outcomes and satisfaction. 

**RESULTS**

The descriptive data on overall JS regarding various sociodemographic attributes are given in Table 2 and the complete WCW JS data as well as separated for the specific region are shown in Table 3. The overall JS in the total sample was 6.1±1.0, with Europe (6.3±0.9) and USA (5.9±1.2) showing the highest and lowest values, respectively. In all respondents, the rate of pay was scored lowest (4.8±1.8; USA, 4.5±1.9; Canada, 4.8±1.8; Europe, 5.2±1.3), and the freedom of working method was scored highest (6.3±0.9). In the freedom of working method variable, the highest satisfaction was achieved in the European SSSM professionals (6.4±1.0) compared with their colleagues from USA and Canada (both 6.3±0.9). The ANOVAs detected no significant differences between the regions in any of the 10 WCW items. Although not significant due to the Bonferroni adjustment, the satisfaction on the rate of pay (F(2,317) = 3.09; p=0.047) as well as on the overall JS (F(3,316) = 3.19; p=0.042) tended to be higher in Europe compared with USA. Personal experience with IPE in own education had no significant influence on overall JS. However, a significant influence of personal experience where IPC impacted patient/client outcomes could be demonstrated (F(3,316) = 5.05; p=0.002). Here, group comparisons revealed a significant (p=0.009) higher overall JS in respondents reporting positive impacts (6.3±0.9) in their personal experience with IPC compared with those who responded mixed impacts (5.9±1.2).

A stepwise regression analysis detected that the opportunity to use abilities had the highest explanatory score of 41% (adjusted R²=0.41) on the overall JS. Up to seven variables (opportunity to use abilities, recognition for work, physical working conditions, amount of variety in work, freedom of working methods, hours of work and colleagues and fellow workers) were included in the regression analysis explaining in total 61% (adjusted R²=0.61) of overall JS variance, as shown in Table 4. Only significant beta-coefficients are reported, and collinearity analysis gave VIF between 1.00 and 1.91 as well as a tolerance from 0.52 to 1.00. The amount of responsibility, the rate of pay and the sociodemographic variables (gender, age, scope of work) were not included in the regression models, and, thus, had no further explanatory contributions to the variance on overall JS.

**DISCUSSION**

The results of this survey align with the theoretical frameworks around self-efficacy, goal setting and COR. They supported the importance of interpersonal communication and teamwork (IPE) and interprofessional collaboration (IPC) in improving patient/customer outcomes and satisfaction.
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Table 2  Overall JS (Warr-Cook-Wall scale) by participants’ sociodemographic attributes

<table>
<thead>
<tr>
<th></th>
<th>Total sample (numbers in each case (per cent values))</th>
<th>Overall JS (mean±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>143 (44.7)</td>
<td>6.2±0.9</td>
</tr>
<tr>
<td>Female</td>
<td>177 (55.3)</td>
<td>6.1±1.1</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20–29</td>
<td>112 (35.0)</td>
<td>6.0±1.0</td>
</tr>
<tr>
<td>30–39</td>
<td>109 (34.1)</td>
<td>6.1±1.1</td>
</tr>
<tr>
<td>≥40</td>
<td>99 (30.9)</td>
<td>6.3±0.9</td>
</tr>
<tr>
<td><strong>Scope of Work</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 h/week</td>
<td>30 (9.4)</td>
<td>5.7±1.2</td>
</tr>
<tr>
<td>20–42 h/week</td>
<td>157 (49.1)</td>
<td>6.3±0.9</td>
</tr>
<tr>
<td>&gt;42 h/week</td>
<td>130 (40.6)</td>
<td>6.0±1.0</td>
</tr>
<tr>
<td><strong>Professional experience in</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sport science/sports medicine</td>
<td>&lt;5</td>
<td>6.1±0.9</td>
</tr>
<tr>
<td></td>
<td>5–9</td>
<td>6.0±1.1</td>
</tr>
<tr>
<td></td>
<td>10–14</td>
<td>6.2±1.2</td>
</tr>
<tr>
<td></td>
<td>15–19</td>
<td>5.9±1.3</td>
</tr>
<tr>
<td></td>
<td>20–24</td>
<td>6.2±0.8</td>
</tr>
<tr>
<td></td>
<td>≥25</td>
<td>6.5±0.6</td>
</tr>
<tr>
<td><strong>Type of employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed by organisation</td>
<td>192 (60)</td>
<td>6.1±1.0</td>
</tr>
<tr>
<td>Self-employed</td>
<td>93 (29.1)</td>
<td>6.2±1.1</td>
</tr>
<tr>
<td>Job-seeking</td>
<td>2 (0.6)</td>
<td>5.0±1.4</td>
</tr>
<tr>
<td>Student/professional training</td>
<td>18 (5.6)</td>
<td>5.9±1.0</td>
</tr>
<tr>
<td>Other</td>
<td>15 (4.7)</td>
<td>6.4±0.7</td>
</tr>
<tr>
<td><strong>Number of self-identified</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>professions</td>
<td>1</td>
<td>6.1±1.0</td>
</tr>
<tr>
<td></td>
<td>2 or more</td>
<td>6.1±1.0</td>
</tr>
<tr>
<td><strong>Number of professions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>regularly interacting in own</td>
<td>1</td>
<td>6.1±0.9</td>
</tr>
<tr>
<td>work</td>
<td>2</td>
<td>6.1±1.0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6.1±1.0</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>6.1±1.0</td>
</tr>
<tr>
<td></td>
<td>≥7</td>
<td>6.1±1.2</td>
</tr>
<tr>
<td><strong>Personal experience with IP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>education in own education</td>
<td>Yes, in professional education (precertification)</td>
<td>6.2±1.0</td>
</tr>
<tr>
<td></td>
<td>Yes, in continuing education (postcertification)</td>
<td>6.2±0.8</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>5.9±1.0</td>
</tr>
</tbody>
</table>

Table 2  Continued

<table>
<thead>
<tr>
<th>Total sample (numbers in each case (per cent values))</th>
<th>Overall JS (mean±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, both precertification and postcertification</td>
<td>104 (32.5)</td>
</tr>
<tr>
<td><strong>Personal experience where IP collaboration impacted</strong></td>
<td></td>
</tr>
<tr>
<td>patient/client outcomes</td>
<td></td>
</tr>
<tr>
<td>Yes—positive impact</td>
<td>175 (54.7)</td>
</tr>
<tr>
<td>Yes—negative impact</td>
<td>3 (0.9)</td>
</tr>
<tr>
<td>Yes—mixed impact</td>
<td>115 (35.9)</td>
</tr>
<tr>
<td>No</td>
<td>27 (8.4)</td>
</tr>
</tbody>
</table>

IP, Interprofessional.

also reinforce that of the previous literature in the health professions and sports medicine where factors such as professional autonomy, recognition/rewards, workplace conditions and compensation can impact overall JS. They also identify differences internationally between factors that influence JS as well as the impact of working experience with interprofessional collaborative practice.

On average, in this self-selected sample, high values were detected in the overall JS of the total sample, which indicates high JS among these professionals in the field of SSSM. In other studies using the same instrument to measure JS, the overall JS of healthcare staff was lower than the values found here, for example, for practice assistants (5.8), physicians (5.5), non-physician staff (5.9), young healthcare professionals (4.9) or mental healthcare professionals (5.3).19-22-24-50Thus, it can be assumed that, on average, professional practice in the field of SSSM is associated with a high overall JS.

Regional comparisons

The results show that overall JS tended to be lowest in the USA and highest in Europe. A possible explanation could be that, on the one hand, more than half of the respondents work more than 42 hour/week in the USA compared with Canada and Europe.8 In addition, different healthcare financing systems, organisational structures of SSSM, as well as different roles, responsibilities and accreditation standards of professions in the SSSM systems may have an influence on overall JS in the examined regions.8 This may be a function of the relative role clarity for athletic trainers in the USA where some perceive that profession’s scope of training may not fully understood by other health professionals.40-51

Factor comparisons

The highest satisfaction is observed in the total sample as well as in all regions for the variable ‘freedom to choose own working methods’. It seems that the survey participants can plan and implement their working
methods independently. This resonates with the fact that, especially in comparison to nursing or biomedical professions, the satisfaction of being able to choose one’s own working methods is reported by therapeutic professions, such as physiotherapy. Independent working processes can be restricted by increasing automation and work compression, which is particularly the case in clinical hospital settings. This does not seem to be the case with the subjects studied here, as many of the survey participants are also entrusted with roles in the therapeutic field and away from the clinical setting (athletic trainers, athletic therapists or sports therapists).

This item, ‘freedom to choose own working methods’, aligns with Bandura’s concepts regarding self-efficacy and Locke and Latham’s goal setting theory. The value placed on freedom to make decision-making and, in turn, role clarity aligns with recommendations in the literature regarding positive and negative influences on JS for health professionals. The influence of workplace recognition and rewards align with the goal setting theory about the need for feedback and reflection. It also reinforces previous research regarding JS and feeling appreciated in their work.

Satisfaction with the rate of pay is lowest in all regions studied, which, as expected, is in line with results from other studies in health professions. COR theory influences work–life balance, these resources can be manifested not only by salary but also in work schedule, paid time off, staff support and the physical environment where one works. Work–life balance and appropriate compensation have been shown to be a major influence on JS in the literature.

The regression analysis shows that the response items: ‘your opportunity to use abilities’, ‘the recognition you get for good work’ and ‘the physical working conditions’ have the highest impact on overall JS. They also

### Table 3: Region specific variables of the Warr-Cook-Wall (WCW) JS questionnaire

<table>
<thead>
<tr>
<th></th>
<th>Total sample (n=320)</th>
<th>USA (n=83)</th>
<th>Canada (n=179)</th>
<th>Europe (n=58)</th>
<th>F-value</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical working condition</td>
<td>6.0±1.0</td>
<td>6.0±0.9</td>
<td>6.0±1.1</td>
<td>6.2±0.8</td>
<td>0.48</td>
<td>0.617</td>
</tr>
<tr>
<td>Freedom of working method</td>
<td>6.3±0.9</td>
<td>6.3±0.9</td>
<td>6.3±0.9</td>
<td>6.4±1.0</td>
<td>0.21</td>
<td>0.807</td>
</tr>
<tr>
<td>Colleagues and fellow workers</td>
<td>6.0±1.1</td>
<td>6.0±1.0</td>
<td>6.0±1.2</td>
<td>6.0±0.9</td>
<td>0.02</td>
<td>0.978</td>
</tr>
<tr>
<td>Recognition for work</td>
<td>5.5±1.5</td>
<td>5.4±1.5</td>
<td>5.4±1.5</td>
<td>5.8±1.2</td>
<td>1.85</td>
<td>0.159</td>
</tr>
<tr>
<td>Amount of responsibility</td>
<td>6.0±1.2</td>
<td>6.0±1.3</td>
<td>6.0±1.2</td>
<td>6.0±1.1</td>
<td>0.03</td>
<td>0.974</td>
</tr>
<tr>
<td>Rate of pay</td>
<td>4.8±1.8</td>
<td>4.5±1.9</td>
<td>4.8±1.8</td>
<td>5.2±1.3</td>
<td>3.09</td>
<td>0.047</td>
</tr>
<tr>
<td>Opportunity to use abilities</td>
<td>5.9±1.2</td>
<td>5.9±1.3</td>
<td>5.9±1.2</td>
<td>5.9±1.1</td>
<td>0.03</td>
<td>0.967</td>
</tr>
<tr>
<td>Hours of work</td>
<td>5.3±1.6</td>
<td>5.2±1.7</td>
<td>5.4±1.5</td>
<td>5.3±1.6</td>
<td>0.48</td>
<td>0.621</td>
</tr>
<tr>
<td>Amount of variety in job</td>
<td>6.1±1.2</td>
<td>6.0±1.1</td>
<td>6.0±1.2</td>
<td>6.3±0.9</td>
<td>1.55</td>
<td>0.214</td>
</tr>
<tr>
<td>Overall job satisfaction</td>
<td>6.1±1.0</td>
<td>5.9±1.2</td>
<td>6.2±1.0</td>
<td>6.3±0.9</td>
<td>3.19</td>
<td>0.042</td>
</tr>
</tbody>
</table>

Data are mean±SD. The possible score for each item ranges between 1 (extremely dissatisfied) and 7 (extremely satisfied). There were no significant differences between USA, Canada and Europe in the respective items.

*Adjusted level of significance: p<0.005.

### Table 4: Relationships between items of job satisfaction and overall job satisfaction

<table>
<thead>
<tr>
<th>How satisfied are you with…</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
<th>Step 6</th>
<th>Step 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your opportunity to use abilities</td>
<td>0.64***</td>
<td>0.46***</td>
<td>0.42***</td>
<td>0.31***</td>
<td>0.26***</td>
<td>0.26***</td>
<td>0.27***</td>
</tr>
<tr>
<td>The recognition you get for good work</td>
<td>0.36***</td>
<td>0.29***</td>
<td>0.27***</td>
<td>0.25***</td>
<td>0.23***</td>
<td>0.20***</td>
<td></td>
</tr>
<tr>
<td>The physical working conditions</td>
<td>0.23***</td>
<td>0.20***</td>
<td>0.18***</td>
<td>0.15***</td>
<td>0.13***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The amount of variety in your job</td>
<td>0.21***</td>
<td>0.19***</td>
<td>0.20***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The freedom to choose your own method of working</td>
<td>0.16***</td>
<td>0.15***</td>
<td>0.13***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The hours of work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.13***</td>
<td>0.12***</td>
<td></td>
</tr>
</tbody>
</table>

R²: 0.41  0.51  0.56  0.58  0.60  0.61  0.59

Adjusted R²: 0.41  0.50  0.55  0.57  0.59  0.60  0.61

Results of the stepwise regression analysis including the whole sample (n=320) and adjusted beta-coefficients; *p<0.05; **p<0.01; ***p<0.001.
align with the theoretical foundation of this paper and show a greater relationship to overall JS; therefore, they need to be considered in workplace to elicit high JS rates. Another interesting result is, in contrast to other studies, that colleagues and fellow workers do not have so much influence on overall JS in this study.

**Interprofessional collaboration**

The survey results around the importance of effective collaboration with colleagues from peer professions on JS in SSSM are reiterated in open-ended responses by the participants. The IPEC domains of Interprofessional Communication and Value and Ethics for IPC are the factors mentioned most often regarding JS.52

**Limitations**

There are several limitations in this survey. The study benefited from the use of a well-known and multiple used scale evaluating JS. However, the number of respondents was too small to compute region-specific regression analyses, and more surveys are needed to focus on JS determinants in the respective regions. The number of responses to the survey may have been limited due to availability of contact information of SSSM professionals in each of the different countries, we also may not have received the most balanced mix of respondents by profession and global region. Additionally, the availability of the survey in only English may have been a barrier to the response rate internationally.

We also must consider that the majority of the respondents was interested in the topic of the survey (selection bias), and general conclusions on the results regarding staff working in SSSM should be drawn with caution. Another source of bias in this project may be that this was administered prior to the 2020 COVID-19 global pandemic which drastically impacted the work-life of all health professionals.51 53 54

**CONCLUSION**

JS and professional burnout among health professionals have been shown to impact quality and safety, patient satisfaction; turnover and reduction of work effort; healthcare costs and personal costs. In general, factors that impact JS for health professionals include professional autonomy, workplace conditions, rewards/recognition, compensation and work-life balance. However, less is known about JS of professions working in SSSM especially from an international perspective. This paper addresses JS among SSSM professionals in an international context. In this study, we found that JS has an important influence on the work and services provided by SSSM professionals, and experience with IPC can have a positive effect on JS which, in turn, can improve quality of life for clients, patients and professionals.

**Acknowledgements**

Thank you to the Canadian Athletic Therapists Association for their support in disseminating the survey to their membership.

**Contributors**

APB and GU equally contributed to the planning, conducting and reporting of the research. APB is guarantor accepting full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

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**Competing interests**

None declared.

**Patient and public involvement**

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication**

Not applicable.

**Ethics approval**

Ethical approval was obtained by the Institutional Review Board at Saint Louis University (SLU IRB #30950) and a clarification of responsibility was conducted by the Cantonal Ethics Committee of the Canton of Zurich (Basel-Nr. Req-2020-00185), stating that an authorisation from the local Ethics Committee is not required. Participants gave informed consent to participate in the study before taking part.

**Provenance and peer review**

Not commissioned; externally peer reviewed.

**Data availability statement**

Data are available upon reasonable request.

Deidentified/aggregate participant data are available upon reasonable request.

**Supplemental material**

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Interprofessional Collaboration in Sports Science and Sports Medicine

Dear participant,

Success in sports is a team effort and should be the case for success in healthcare, too. However, health care workers traditionally operate in silos without integrating other health professions in their working routine. (Breitbach, Reeves and Fletcher, 2017)

In contrast to this traditional siloed model, the interprofessional (IP) collaborative model suggests that healthcare workers should communicate and collaborate over professional boundaries. More specifically, the WHO defines IP collaboration (IPC) as follows: "when multiple health workers from different professional backgrounds work together with patients, families, carers (caregivers), and communities to deliver the highest quality of care." (WHO, 2010).

The aim of this international survey is to gain insights from professionals who work in sports science or sports medicine on IPC and education.

It takes about 15 minutes to complete the survey. The survey is conducted in the English language.

Information collected from the survey will not be identifiable. Survey data will be stored electronically on the password-protected, secure server through the Qualtrics Survey Software maintained per Saint Louis University IRB guidance. Participation is voluntary and you may choose to withdraw and not submit the survey at any time without consequences.

Thank you for taking the time to participate in this study and supporting us in our
research on IPC and education in international sports science and sports medicine.

Sincerely,
Dr. Anthony Breitbach (Doisy College of Health Sciences, Saint Louis University, St. Louis, USA)
Dr. Gert Ulrich (Careum Foundation, Department of Education Management, Zurich, Switzerland)

☐ I am at least 18 years old and agree to participate.

Which professions best describe you:
(select all that apply)

☐ Athletic Trainer
☐ Athletic Therapist
☐ Sports Therapist
☐ Physical Therapist/Physiotherapist
☐ Human Performance/Strength and Conditioning Coach
☐ Personal Trainer
☐ Sports Scientist/Exercise Physiologist
☐ Biomechanist/Biokineticist
☐ Kinesiologist/Kinesiotherapist
☐ Occupational Therapist
☐ Speech Language Pathologist
☐ Physician
☐ Physician Assistant
☐ Nurse
☐ Dietitian/Nutritionist/Biokinesiologist
☐ Massage Therapist
☐ Psychologist/Mental Trainer
☐ Other (describe):
Which best describe your professional role in sports science and sports medicine:
(select all that apply)

☐ Clinician/Practitioner
☐ Academic/Educator
☐ Researcher/Scientist
☐ Administrator/Manager
☐ Diagnostic Technician
☐ Student
☐ Other:

Which is your primary country/region of employment:

What are your primary sport(s) of your patients/clients (if no sports write NONE)

Which best describe the sport or health care organization where you are formally affiliated:
(Select all that apply)

☐ Professional/ Elite Athletes
☐ Amateur Athletes
☐ Academic/University
☐ Secondary School/Youth
☐ Recreational/Leisure sports
☐ Hospital/Health Center
☐ Specialty Clinic
Years of experience as a Sports Science/Sports Medicine professional:

Which professions do you regularly interact with as a Sports Science/Sports Medicine professional:
(Select all that apply)

☐ Athletic Trainer
☐ Athletic Therapist
☐ Sports Therapist
☐ Physical Therapist/Physiotherapist
☐ Human Performance/Strength and Conditioning Coach
☐ Personal Trainer
☐ Sports Scientist/Exercise Physiologist
☐ Biomechanist/Biokineticist
☐ Kinesiologist/Kinesiotherapist
☐ Occupational Therapist
☐ Speech Language Pathologist
☐ Physician
☐ Physician Assistant
☐ Nurse
☐ Dietitian/Nutritionist
☐ Massage Therapist
☐ Psychologist/Mental Trainer
☐ Other (describe):
Type of employment:

- ( ) Employed by organization/institution
- ( ) Self-employed/freelance
- ( ) Job-seeking
- ( ) Student/Professional Training
- ( ) Other (describe):

Mean/average working hours per week:

You identify as which gender:

- ( ) Female
- ( ) Male
- ( ) Other (describe):

Your age in years:

Communications and teamwork with other health and social care professionals:

For each of the following statements please circle the number of response that best reflects how you would feel or behave.
I feel comfortable justifying recommendations/advice face to face with more senior people.

Strongly agree  Agree  Disagree  Strongly disagree

I feel comfortable explaining an issue to people who are unfamiliar with the topic.

Strongly agree  Agree  Disagree  Strongly disagree

I have difficulty in adapting my communication style (oral and written) to particular situations and audiences.

Strongly agree  Agree  Disagree  Strongly disagree

I prefer to stay quiet when other people in a group express opinions that I don’t agree with.

Strongly agree  Agree  Disagree  Strongly disagree

I feel comfortable working in a group.

Strongly agree  Agree  Disagree  Strongly disagree

I feel uncomfortable putting forward my personal opinions in a group.

Strongly agree  Agree  Disagree  Strongly disagree

I feel uncomfortable taking the lead in a group.

Strongly agree  Agree  Disagree  Strongly disagree
I am able to become quickly involved in new teams and groups.

**Strongly agree**  [ ]  **Agree**  [ ]  **Disagree**  [ ]  **Strongly disagree**  [ ]

I am comfortable expressing my own opinions in a group, even when I know that other people don’t agree with them.

**Strongly agree**  [ ]  **Agree**  [ ]  **Disagree**  [ ]  **Strongly disagree**  [ ]

**Attitudes to learning with other health and social care professionals:**

For each of the statements below please circle the number that best reflects your opinion.

Skills in communicating with patients/clients would be improved through learning with students from other health and social care professions.

**Strongly agree**  [ ]  **Agree**  [ ]  **Neither agree or disagree**  [ ]  **Disagree**  [ ]  **Strongly disagree**  [ ]

Skills in communicating with other health and social care professionals would be improved through learning with students from other health and social care professions.

**Strongly agree**  [ ]  **Agree**  [ ]  **Neither agree or disagree**  [ ]  **Disagree**  [ ]  **Strongly disagree**  [ ]

I would have preferred to learn only with peers from my own profession.

**Strongly agree**  [ ]  **Agree**  [ ]  **Neither agree or disagree**  [ ]  **Disagree**  [ ]  **Strongly disagree**  [ ]
Learning with students from other health and social care professions is likely to facilitate subsequent working professional relationships.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

Learning with students from other health and social care professions would be more beneficial to improving my teamwork skills than learning only with my peers.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

Collaborative learning would be a positive learning experience for all health and social care students.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

Learning with students from other health and social care professions is likely to help to overcome stereotypes that are held about the different professions.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

I would have enjoyed the opportunity to learn with students from other health and social care professions.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

Learning with students from other health and social care professions is likely to improve the service for patient/client.
Interaction with other health and social care professionals:

For each of the following statements please circle the number of response that best reflects your own attitude/opinion.

Different health and social care professionals have stereotyped views of each other.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

The line of communication between all members of the health and social care professions is open.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

There is a status hierarchy in health and social care that affects relationships between professionals.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

Different health and social care professionals are biased in their views of each other.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

All members of health and social care professions have equal respect for each discipline.
It is easy to communicate openly with people from other health and social care disciplines.

Not all relationships between health and social care professionals are equal.

Health and social care professionals do not always communicate openly with one another.

Different health and social care professionals are not always cooperative with one another.

Relationships with other health and social care professionals:

For each of the following statements please circle the number of response that best reflects your own attitude/opinion.

I have an equal relationship with peers from my own professional discipline.
<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree or disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident in my relationships with my peers from my own professional discipline.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a good understanding of the roles of different health and social care professionals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident in my relationships with people from other health and social care disciplines.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am comfortable working with people from other health and social care disciplines.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel that I am respected by people from other health and social care disciplines.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I lack confidence when I work with people from other health and social care disciplines.</td>
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</table>

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I am comfortable working with people from my own professional discipline.

Strongly agree  Agree  Neither agree or disagree  Disagree  Strongly disagree

Job Satisfaction

Please indicate how dissatisfied or satisfied you are with various aspects of your job. Give your first and natural answer by working quickly, but be accurate, and answer all questions.

The physical working conditions:

Extremely satisfied  Moderately satisfied  Slightly satisfied  Neither satisfied nor dissatisfied  Slightly dissatisfied  Moderately dissatisfied  Extremely dissatisfied

The freedom to choose your own method of working:

Extremely satisfied  Moderately satisfied  Slightly satisfied  Neither satisfied nor dissatisfied  Slightly dissatisfied  Moderately dissatisfied  Extremely dissatisfied

Your colleagues and fellow workers:

Extremely satisfied  Moderately satisfied  Slightly satisfied  Neither satisfied nor dissatisfied  Slightly dissatisfied  Moderately dissatisfied  Extremely dissatisfied

The recognition you get for good work:

Extremely satisfied  Moderately satisfied  Slightly satisfied  Neither satisfied nor dissatisfied  Slightly dissatisfied  Moderately dissatisfied  Extremely dissatisfied
The amount of responsibility you are given:

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied
- Moderately dissatisfied
- Extremely dissatisfied

Your rate of pay:

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied
- Moderately dissatisfied
- Extremely dissatisfied

Your opportunity to use abilities:

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied
- Moderately dissatisfied
- Extremely dissatisfied

Your hours of work:

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied
- Moderately dissatisfied
- Extremely dissatisfied

The amount of variety in your job:

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied
- Moderately dissatisfied
- Extremely dissatisfied

Taking everything into consideration, how do you feel about your job:

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied
- Moderately dissatisfied
- Extremely dissatisfied
In your professional education/vocational training/study pre-certification/licensure or during continuing education post-certification/licensure, did you have interprofessional collaboration, where you learned in common with, from and about learners/trainees/students from other (health) professions?

- Yes, in professional education pre-certification/licensure
- Yes, in continuing education post-certification/licensure
- Yes, both in pre- and post-certification/licensure
- No

Have you had personal experiences where interprofessional collaboration has impacted patient/client outcomes?

- Yes - positive impact
- Yes - negative impact
- Yes - mixed impact
- No

The items in this survey are easy and clear to understand:

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

A regular survey of health professions working in sport science and/or medicine regarding interprofessional collaboration and learning is useful:

- Strongly agree
- Agree
- Neither agree or disagree

Disagree

Strongly disagree

In my opinion, the title of “Athletic Trainer” indicates the following professional role and responsibilities:

What else would you like to tell us?

Could we use your answers of this survey to evaluate the effectiveness of this survey?

Yes

No

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