

Towards a better understanding of medical students' mentorship needs: a self-determination theory perspective Vers une meilleure compréhension des besoins en mentorat chez les étudiants en médecine : Une approche fondée sur la théorie de l'autodétermination

Adam Neufeld,¹ Bryden Hughton,² Javeria Muhammadzai,² Meredith McKague,³ Greg Malin³

¹Department of Academic Family Medicine, Cumming School of Medicine, University of Calgary, Alberta, Canada; ²Undergraduate Medical Education, College of Medicine, University of Saskatchewan, Saskatchewan, Canada; ³Department of Academic Family Medicine, College of Medicine, University of Saskatchewan, Saskatchewan, Canada

Correspondence to: Adam Neufeld, MD, MSc; email: adam.neufeld@ucalgary.ca; Twitter: @AdamNeufeld4

Published ahead of issue: August 19, 2021; CMEJ 2021 Available at <http://www.cmej.ca>

© 2021 Neufeld, Hughton, Muhammadzai, McKague, Malin; licensee Synergies Partners

<https://doi.org/10.36834/cmej.71857>. This is an Open Journal Systems article distributed under the terms of the Creative Commons Attribution License.

<https://creativecommons.org/licenses/by-nc-nd/4.0/> which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is cited.

Abstract

Introduction: Mentorship programs are ubiquitous in medical education. However, few emphasize equal development for learners and mentors, or incorporate clinical skills, which may be important for promoting medical students' self-determination. Central to this consideration are the three basic psychological needs for autonomy, competence, and relatedness, described by Self-Determination Theory (SDT). Grounded in SDT, this study assesses the extent that meeting these needs, in a near-peer mentoring program, impacts learners' and mentors' motivation and perceived competence about learning and teaching of clinical knowledge, respectively.

Methods: Medical students from the University of Saskatchewan, who participated in its near-peer mentoring program (PULSE: Peers United in Leadership & Skills Enhancement), were invited to complete an anonymous survey. Regression was used to determine how the program's learning climate impacted learners' and mentors' psychological need satisfaction and perceived competence within their mentorship role.

Results: Learners and mentors both rated PULSE as highly needs-satisfying. In turn, this was associated with greater perceived competence about learning and teaching of the material.

Conclusions: Findings from this study suggest that mentoring programs in medical education, which support learners' basic psychological needs, may promote their motivation and perceived competence—both about learning and also teaching of clinical skills. The implications of these results are discussed from an SDT perspective, with respect to mentoring programs in medical education.

Résumé

Introduction: Les programmes de mentorat sont très répandus en éducation médicale. Ceux qui mettent l'accent sur un statut égal des apprenants et des mentors ou qui intègrent des compétences cliniques pouvant favoriser l'autodétermination des étudiants en médecine sont toutefois rares. Les trois besoins psychologiques fondamentaux décrits par la théorie de l'autodétermination (TAD), à savoir l'autonomie, la compétence et l'appartenance, sont au cœur de cette préoccupation. Fondée sur la théorie de l'autodétermination, la présente étude évalue dans quelle mesure la satisfaction de ces besoins, dans le cadre d'un programme de mentorat par les quasi-pairs, a un impact sur la motivation et la compétence perçue des apprenants et des mentors en matière d'apprentissage et d'enseignement des connaissances cliniques.

Méthodes: Les étudiants en médecine de l'Université de Saskatchewan, qui ont participé au programme de mentorat par les quasi-pairs (PULSE: Peers United in Leadership & Skills Enhancement), ont été invités à remplir de façon anonyme un sondage. Des analyses de régression ont été réalisées pour déterminer l'impact du climat d'apprentissage dans le programme sur la satisfaction des besoins psychologiques des apprenants et des mentors et sur la compétence perçue de ces derniers dans leur rôle de mentors.

Résultats: Les apprenants et les mentors ont estimé PULSE comme hautement satisfaisant pour leurs besoins. Cela a été associé à une plus grande compétence perçue en ce qui concerne l'apprentissage et l'enseignement des contenus.

Conclusions: Les résultats de cette étude suggèrent que les programmes de mentorat en éducation médicale qui soutiennent les besoins psychologiques fondamentaux des apprenants peuvent renforcer leur motivation et leur compétence perçue, à la fois pour l'apprentissage et pour l'enseignement des compétences cliniques. Les incidences de ces résultats pour les programmes de mentorat par les pairs en éducation médicale sont analysées du point de vue de la TAD.

Introduction

Near-peer mentorship (NPM) programs are gaining popularity in medical education, given their many positive attributes.¹ Despite this trend, however, few have considered students' psychological needs for autonomy, competence, and relatedness, which according to Self Determination Theory (SDT), are required in the learning environment, to support optimal motivation, development, and well-being.^{2,3} While the importance of supporting these three fundamental needs is increasingly being recognized in medical education, there are few studies that focus on SDT in NPM programs (e.g., see Lewis *et al.*⁴). This gap seems quite important, given most programs tend to focus solely on medical students' need for relatedness (i.e., by simply pairing them together longitudinally), without addressing their autonomy and competence needs. Additionally, most published studies have not incorporated clinical knowledge or teaching development (i.e., for mentors), which is also an important component of the NPM interaction that we think should be explored.

Using SDT as a lens, our study addresses this gap by analyzing how a NPM program—PULSE (Peers United in Leadership & Skills Enhancement)—attempts to foster these psychological needs for learners and mentors, and in turn, their perceived competence about learning and teaching of clinical skills. PULSE is an optional, extracurricular, small group (2-4 learners and two mentors), semi-structured student initiative. It connects medical students on a weekly basis throughout the year, to support clinical skill development for Year 1 students, and mentorship and teaching opportunities for Year 2 students (see Neufeld *et al.*, 2020 for a full description). Of note, mentees and mentors receive no “pre-training” on SDT or how to approach their learning or mentoring—that is for them to realize, as they learn what works and why. PULSE's learning environment is simply designed to promote both groups' ability to satisfy their autonomy, competence, and relatedness needs (i.e., via its self-directed, stimulating, skill practice/review, and relational near-peer nature).

According to SDT, people universally require ongoing satisfaction of autonomy (the need for volition), competence (the need for efficacy), and relatedness (the need for connectedness) to thrive.³ Hence, environments that support these needs tend to encourage better engagement, performance, and well-being outcomes, than environments that hinder them.³ Additionally, they

promote perceived competence (how confident one feels about doing a particular task³), which studies have demonstrated is important for medical students.⁵ Within a mentorship context, mentee and mentor happiness and satisfaction within their mentorship roles were attributed primarily to the feeling of support for competence.⁶ Research in this area thereby highlights the value of moving beyond the typical focus of relatedness in mentorship, and why it is also important to consider the mentors' psychological needs, particularly in a NPM context, where they (and not just mentees) are also in a position of growth. For instance, mentors have different types of motives (e.g., self-focused, protégé focused, and/or relationships-focused) for wanting to provide developmental support to mentees.⁷ For these reasons, we feel that it is imperative to consider how the learning environment, in mentoring programs, might support both learners' and mentors' psychological needs for autonomy, competence, and relatedness. This is why PULSE was created.

Methods

Ethics approval

This research received approval from the University of Saskatchewan Research Ethics Board in April of 2019 (ID # 1100).

Participants & procedures

Ninety University of Saskatchewan medical students who participated in PULSE—53 first year ‘learners’ (23 male and 29 female) and 37 second year ‘mentors’ (15 male and 16 female)—were invited to complete an anonymous online survey. Just over half (16/31) of the sample's PULSE ‘mentors’ were PULSE ‘learners’ in the year prior. Surveys were sent out once, toward the end of the academic school year (i.e., in late April), after PULSE sessions had finished. Both groups completed different versions of the survey, depending on their mentorship role (see Measures). No specific recruitment methods (e.g., social media invitations) were used beyond email invitations, which were sent from an unbiased (non-author) research coordinator within the College of Medicine. Students received one reminder to consider participating. Data were collected in aggregate form to maintain confidentiality and mitigate response bias. All students provided informed consent prior to participation in the study.

Measures

Both groups of students (learners and mentors) completed the following scales, which were oriented to reflect their roles and experiences in PULSE.

Learning Climate Questionnaire (LCQ): The 6-item LCQ measures learners' perspective of the autonomy-supportiveness of their mentors, on a scale from 1 to 7 (where 1 = strongly disagree, 4 = neutral, and 7 = strongly agree). As PULSE sessions are delivered by a variety of mentors, the general version of the LCQ was used to capture students' perceptions of PULSE's learning climate with all their mentors. Scores were calculated by averaging item scores. Higher scores represent stronger perceived autonomy support. The LCQ has demonstrated strong internal consistency in previous studies.^{5,8,9}

Basic Need Satisfaction at Work Scale (W-BNS): This 21-item scale measures workplace need satisfaction (autonomy, competence, relatedness) on a scale from 1 to 7 (where 1 = not true at all, 4 = somewhat true, and 7 = very true). Both learners and mentors completed this scale to assess how needs-supportive they each found PULSE's learning environment and work-related experience. For both the learner and mentor groups, we calculated average satisfaction scores for the individual autonomy (ASAT), competence (CSAT), and relatedness (RSAT) subscales, as well as an aggregated or total score for basic psychological need satisfaction (BPNS), where higher scores reflect higher levels of need satisfaction. This scale has shown strong reliability.^{10,11}

Perceived Competence Scale (PCS): The 4-item Likert-type PCS assesses feelings of competence in a given task, which for our study, refers to learning (for learners) or teaching (for mentors) of clinical skills in PULSE sessions. Scores were calculated by averaging the four items, where higher scores reflect higher perceived competence (PC-L for learning and PC-T for teaching, respectively). This scale has demonstrated strong psychometric properties.^{5,12}

Statistical analyses

The software program SPSS version 24 was used for all statistical analyses. There were no outliers or surveys with insufficient data (under half of scales completed), so all participant data were analyzed. All data met the assumptions of normality and homoscedasticity, and were standardized and assessed for correlation, with negligible multicollinearity. We calculated Cronbach's alpha values for each scale, which demonstrated good reliability (above .90 for learners and between .76 to .86 for mentors). For learners, linear regressions assessed: how PULSE's learning climate (LCQ) impacted overall need satisfaction (BPNS), and in turn, how overall need satisfaction (BPNS) impacted

perceived competence in learning (PC-L). Following this, we analyzed how each of the autonomy (ASAT), competence (CSAT), and relatedness (RSAT) satisfaction subscales predicted their perceived competence in learning (PC-L), when entered as separate independent variables. Similarly for mentors, linear regressions assessed: how overall need satisfaction (BPNS) in PULSE impacted perceived competence in teaching (PC-T), followed by how each need satisfaction subscale (ASAT, CSAT, RSAT) predicted perceived competence in teaching (PC-T). R^2 effect sizes and p -values are presented, accordingly.

Results

Demographics

The response rate of the 'learners' was 36.5% (19/52), while the response rate of the 'mentors' was 41.9% (13/31). The average number of sessions 'learners' attended was 2-3 each ($M = 2.71$, $SD = 0.62$) with a range of 1-9 sessions, while the average number of sessions the 'mentors' attended was 4-5 each ($M = 4.90$, $SD = 1.36$), with a larger range of 1-13 sessions.

How the learning climate impacts motivation and perceived competence

As seen in Table 1, there were strong positive correlations between PULSE's learning climate and learners' need satisfaction and perceived competence in learning. Similarly (see Table 2), there was a strong positive correlation between how needs-satisfying mentors felt PULSE sessions were and their perceived competence about teaching. Both groups' mean scores for autonomy, competence, and relatedness supported high levels of need satisfaction.

Next, several simple regressions were run (see Statistical Analyses). As expected, PULSE's learning climate positively related to learners' overall need satisfaction ($R^2 = .39$, $p = .01$). In turn, when overall need satisfaction was entered into the regression as the independent variable, it positively related to perceived competence in learning the material ($R^2 = .32$, $p < .05$). Interestingly, none of the individual need satisfaction variables (autonomy, competence, or relatedness), alone, were significant correlates of this outcome (all p 's $> .05$).

Table 1. Correlations between PULSE's learning climate and learners' psychological need fulfilment and perceived competence in learning

| | LCQ | ASAT | CSAT | RSAT | BPNS | PC-L |
|--------|------------|------------|------------|------------|------------|------------|
| LCQ | – | | | | | |
| ASAT | .57* | – | | | | |
| CSAT | .56* | .66** | – | | | |
| RSAT | .59* | .73** | .89** | – | | |
| BPNS | .62* | .88** | .92** | .95** | – | |
| PC-L | .88** | .42 | .59* | .55* | .57* | – |
| M (SD) | 6.14 (.91) | 5.40 (.91) | 5.34 (.86) | 5.82 (.81) | 5.53 (.79) | 6.29 (.85) |

LCQ, learning climate; ASAT, autonomy satisfaction; CSAT, competence satisfaction; RSAT, relatedness satisfaction; BPNS, basic psychological need satisfaction (autonomy, competence, relatedness); PC-L, perceived competence in learning; M, mean; SD, standard deviation

* $p < .05$ and ** $p < .01$ (two-tailed)

Table 2. Correlations between mentors' psychological need fulfilment and perceived competence in teaching PULSE sessions

| | ASAT | CSAT | RSAT | BPNS | PC-T |
|--------|------------|------------|------------|------------|------------|
| ASAT | – | | | | |
| CSAT | .48 | – | | | |
| RSAT | .84** | .63* | – | | |
| BPNS | .88** | .79** | .96** | – | |
| PC-T | .46 | .55 | .60* | .62* | – |
| M (SD) | 5.47 (.56) | 5.43 (.63) | 5.44 (.89) | 5.45 (.62) | 5.62 (.56) |

ASAT, autonomy satisfaction; CSAT, competence satisfaction; RSAT, relatedness satisfaction; BPNS, basic psychological need satisfaction (autonomy, competence, relatedness); PC-T, perceived competence in teaching; M, mean; SD, standard deviation

* $p < .05$ and ** $p < .01$ (two-tailed)

In parallel, mentors' overall need satisfaction in PULSE positively related to their perceived competence about teaching the material ($R^2 = .38$, $p = .01$). Again, whereas overall need satisfaction significantly predicted this outcome, when each of the three needs subscales (for autonomy, competence, or relatedness) were entered into the regression as separate independent variables, none were significant predictors of this outcome (all p 's $> .05$).

Discussion

Using SDT as a lens, this study looked at how medical 'learners' and 'mentors' perceived their NPM experiences in PULSE, with respect to their psychological need fulfilment and corresponding feelings of competence. As we hypothesized, both groups found PULSE sessions highly supportive to their autonomy, competence, and relatedness and this corresponded with greater perceived competence about learning and teaching of clinical material. These findings support other studies within medical education, demonstrating psychological and academic benefits of NPM programs.^{13,14} Further, they reinforce the notion that while learners and mentors share and require support for the same basic psychological needs, their motives to engage in NPM program activities may indeed be different.⁷

Regardless of program structure or a medical student's stage of training (i.e., pre-clinical versus clinical), this study's findings may have broad implications for the

development, reform, and evaluation of mentoring programs in medical education. For instance, institutions that wish to foster medical students' self-directed learning, relationship formation, skills development, and well-being, may wish to design their mentoring programs in ways that maximize supports for these three basic psychological needs, as posited by SDT.

Limitation, strengths, and future directions

This study has several limitations which may guide future research. First, PULSE is the first NPM program of its kind in Canadian medical education.¹⁵ Thus, while preliminary results are encouraging and suggest benefits for satisfying students' basic needs, further research is required to extend these findings. Second, PULSE has primarily relied on self-report data, which may invite response bias. That said, we used well-established scales with good reliability, which facilitates replication. Third, this study has a relatively low sample size—presumably because data collection occurred around when the COVID-19 pandemic hit. This may have hindered survey engagement (i.e., due to email burden or less proximity to campus), as well as our ability to detect significant relationships between each individual need and learners' and mentors' perceived competence. Findings should therefore be interpreted with caution in terms of generalizability, and future studies may assess the individual contribution of each need in relation to medical students' perceived competence in clinical learning or teaching. With a larger sample size, causal

modeling could examine the inter-relationships among learning climate, needs satisfaction, and perceived competence.

Finally, it is important to acknowledge that this study assesses basic psychological need satisfaction and learning climate in clinical learning and teaching skills (and not actual skills competency). This distinction reflects our position as authors—that mentoring programs ought to complement medical students' education and not be evaluative or generate additional and burdensome pressures in any way. Other research supports that fostering medical students' needs for autonomy, competence, and relatedness is enough to optimize their engagement, academic performance, and mental health.^{16,17,18} In view of this, the ethos of PULSE and its research, which are grounded in SDT, is humanistic and person-focused (and not performance or outcomes-focused). It therefore focuses on promoting students' basic needs for optimal motivation and feelings of confidence in their developing skills—aspects that otherwise come under threat during medical school.^{10,19}

Conclusions

This study looked at how a person-focused NPM program can satisfy psychological needs for medical students. Results highlight the important relationship between the program's learning climate and its participants' corresponding perceptions of psychological need satisfaction and clinical competence—both in learning and teaching of clinical skills material. Ultimately, mentoring programs that consider their mentees' and mentors' unique motivations for participating, and that attempt to support these basic psychological needs, ought to promote their healthy development.

Conflicts of Interest: None

References

- Akinla O, Hagan P, Atiomo W. A systematic review of the literature describing the outcomes of near-peer mentoring programs for first year medical students. *BMC Med Educ*. 2018; 18:98. <https://doi.org/10.1186/s12909-018-1195-1>
- Deci EL, Ryan RM. The " what " and " why " of goal pursuits: human needs and the self-determination of behavior. *Psychol Inq*. 2000;11(4):227-268. https://doi.org/10.1207/S15327965PLI1104_01
- Ryan RM, Deci EL. *Self-Determination Theory: Basic Psychological Needs in Motivation Development and Wellness*. Guilford Publishing; 2017.
- Lewis V, Martina CA, McDermott MP, et al. A randomized controlled trial of mentoring interventions for underrepresented minorities. *Acad Med*. 2016;91(7). <https://doi.org/10.1097/ACM.0000000000001056>
- Williams GC, Deci EL. Internalization of biopsychosocial values by medical students: A test of self-determination theory. *J Pers Soc Psychol*. 1996;70(4):767-779. <http://dx.doi.org/10.1037/0022-3514.70.4.767>
- Dantzer B. Supporting the self-determination of mentors and mentees in a cross-age peer mentoring program. 2018. <https://doi.org/10.14288/1.0365286>
- Janssen S, van Vuuren M, de Jong MDT. Motives to mentor: self-focused, protégé-focused, relationship-focused, organization-focused, and unfocused motives. *J Vocat Behav*. 2014;85(3). <https://doi.org/10.1016/j.jvb.2014.08.002>
- Williams GC, Saizow R, Ross L, Deci EL. Motivation underlying career choice for internal medicine and surgery. *Soc Sci Med*. 1997;45(11):1705-1713. [https://doi.org/10.1016/S0277-9536\(97\)00103-2](https://doi.org/10.1016/S0277-9536(97)00103-2)
- Black AE, Deci EL. The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Sci Educ*. 2000;84(6):740-756. [https://doi.org/10.1002/1098-237X\(200011\)84:6<740::AID-SCE4>3.0.CO;2-3](https://doi.org/10.1002/1098-237X(200011)84:6<740::AID-SCE4>3.0.CO;2-3)
- Ilardi BC, Leone D, Kasser T, Ryan RM. employee and supervisor ratings of motivation: main effects and discrepancies associated with job satisfaction and adjustment in a factory setting. *J Appl Soc Psychol*. 1993; 23: 1789-1805. <https://doi.org/10.1111/j.1559-1816.1993.tb01066.x>
- Deci EL, Ryan RM, Gagné M, Leone DR, Usunov J, Kornazheva BP. Need satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: a cross-cultural study of self-determination. *Personal Soc Psychol Bull*. 2001;27(8):930-942. <https://doi.org/10.1177/0146167201278002>
- Schultz PP, Ryan RM, Niemiec CP, Legate N, Williams GC. Mindfulness, work climate, and psychological need satisfaction in employee well-being. *Mindfulness (N Y)*. 2015; 6, 971–985. <https://doi.org/10.1007/s12671-014-0338-7>
- Blohm M, Lauter J, Branchereau S, et al. "Peer-assisted learning" (PAL) in the Skills-Lab—an inventory at the medical faculties of the Federal Republic of Germany. *GMS Z Med Ausbild*. 2015; 2015;32(1):Doc10. <https://doi.org/10.3205/zma000952>
- Andre C, Deerin J, Leykum L. Students helping students: vertical peer mentoring to enhance the medical school

- experience. *BMC Res Notes*. 2017; 10:176. <https://doi.org/10.1186/s13104-017-2498-8>
15. Neufeld A, Huschi Z, Ames A, Malin G, McKague M, Trinder K. Peers United in Leadership & Skills Enhancement (PULSE): a near peer mentoring program for medical students. *Can Med Educ J*. 2020; 11(6):e145-e148. <https://doi.org/10.36834/cmej.69920>
 16. Kusurkar RA, Croiset G. Autonomy support for autonomous motivation in medical education. *Med Educ Online*. 2015; 20:1. <https://doi.org/10.3402/meo.v20.27951>
 17. Orsini CA, Binnie VI, Tricio JA. Motivational profiles and their relationships with basic psychological needs, academic performance, study strategies, self-esteem, and vitality in dental students in Chile. *J Educ Eval Health Prof*. 2018;15:11. <https://doi.org/10.3352/jeehp.2018.15.11>
 18. Neufeld A, Malin G. How medical students' perceptions of instructor autonomy-support mediate their motivation and psychological well-being. *Med Teach*. 2020; 42:6, 650-656. <https://doi.org/10.1080/0142159X.2020.1726308>
 19. Neufeld A, Malin G. Basic Psychological Needs, more than Mindfulness and Resilience, Relate to Medical Student Stress: A Case for Shifting the Focus of Wellness Curricula. *Med Teach*. 2020; 42:12, 1401-1412. <https://doi.org/10.1080/0142159X.2020.1813876>