

Progress of Nursing Students' Motivation Regulation Profiles and Affiliations with Engagement, Burnout and Academic Performance

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This longitudinal study explored the development of Finnish undergraduate nursing students' motivation regulation profiles during two years in traditional and blended learning environments. Also, the association between the profiles and experienced study engagement, burnout and academic performance was investigated. The data were collected with a survey and included motivation regulation, study engagement, and burnout scales that were combined with students' entrance examination scores, study credits, and grade point averages. Regardless of the learning environment, a majority (62.3%) of the students showed a sustainable, highly developed motivation regulation profile over time. They reported strong study engagement, higher academic performance, and reduced susceptibility to cynicism when compared to the students with less-developed motivation regulation profiles. However, individual reciprocal transitions between motivation regulation profiles over time were found with a group of students. As such, motivation regulation is changeable and influenced by situational components in learning. This aspect should be emphasized in developing professional higher education and teaching.

Introduction

The motivation to learn is suggested to be a key for successful studying in higher education and degree completion, as well as later on in a career, in order to experience work engagement and to avoid experiencing burn-out (Boekaerts, 2016; Linnenbrink-Garcia et al., 2018). Development of motivation is grounded in students' beliefs, appraisals, and experiences about learning, and it is affected by their personal choices, goals, and the strategies employed throughout their studies (Linnenbrink-Garcia & Patall, 2016). Moreover, research has shown that motivation is not a static individual characteristic, and it can be actively steered by the students themselves. Through the self-regulation of learning, and motivation regulation especially, students can modify, adapt and direct their motivated learning and intentionally build up a motivated learning profile that supports their learning and engagement throughout their studies (Salamonson et al. 2016; Smit, de Brabander, Boekaerts, & Martens, 2017).

Self-regulated learning (SRL) refers to the learner's intentional monitoring, activating and sustaining behaviors, cognitions, motivations, and affects that are oriented toward the attainment of learning goals (Pintrich 2004; Schunk, 2014; Zimmermann, 2011). SRL skills, and motivation regulation in particular, are essential to developing nursing students' vocational competence as they prepare for their nursing careers, which require constantly developing professionalism and the completion of varying and demanding tasks (e.g., medication management, critical thinking, the provision high-quality care, the promotion of safety, working with various health technologies) (Sulosaari et al., 2015; Toode, Routasalo, Helminen, & Suominen, 2015). Furthermore, the ability to maintain and control motivation become of even greater importance since

nursing students have often been shown to suffer from a lack of motivation (Warrén, Stomberg, & Nilsson, 2010) and high levels of stress during their studies (e.g., Bartlett, Taylor, & Nelson, 2016). Motivation regulation skills are therefore essential for newly graduated registered nurses who will inevitably find their work stressful and demanding (Flinkman & Salanterä, 2015).

Although there is prior research on nursing students' overall motivation (Bronson, 2016; Khalaila, 2015; Nesje, 2015; Yardimci et al., 2017) and the SRL, including the motivation regulation of higher education students in other fields (Engelschalk, Steuer, & Dresel, 2017; McMillan, 2010; Schwinger, Steinmar, & Spinath, 2012; Smit et al., 2017; Wolters, & Benzoni, 2013), research on undergraduate health care, nursing students' motivation regulation, and their use of motivation regulation strategies is still scarce (Hoops, Yu, Wang, & Hollyer, 2016; Vanthournout, Gijbels, Coertjens, Donche, & Van Petegem, 2012; Wolters & Benzoni, 2013). Even less is known about the function of motivation regulation both among those nursing students who struggle to cope with burnout and the desire to dropout from their studies and their counterparts who are highly engaged and high achieving.

This study aims to gain better understanding of the development of nursing students' motivation regulation in two different nursing programs by applying longitudinal design. Also, association between the motivation regulation profiles and students' study engagement, burnout, and academic performance are explored.

Motivation Regulation as a Part of SRL

Motivation regulation is a crucial part of SRL and refers to students' conscious and active practice of

processing thoughts and actions systematically to try to influence their motivation levels concerning certain learning activities (Winne & Hadwin, 2012; Wolters, 2003). A high level of motivation regulation can increase students' attention to their learning processes and outcomes, choices of tasks, efforts to learn difficult tasks, and persistence in completing time-consuming tasks, such as achieving mastery of a complex skill (Zimmermann, 2011). To regulate their motivation, students can utilize different strategies such as interest enhancement, efficacy management, self-consequating, regulation of mastery goals, regulation of performance goals, environmental structuring, and regulation of value (Wolters, 2003). The five last-mentioned are explored in this study.

Self-consequating (SC). Self-consequating refers to the students use of self-provided consequences for their own behaviour (Wolters, 2003). For example students can create self-administered consequences, rewards or punishments to influence on their motivation (Wolters & Benzoni, 2013). (e.g. "After I have studied two hours, I can go for a walk.")

Regulation of mastery goals (RMG). Regulation of mastery goals refers to the students' desire to reach goals associated with mastery-related reasons (Wolters, 2003). Students can, for example, think about how to master tasks in order to improve their abilities and become more competent or knowledgeable (Wolters & Benzoni, 2013). (e.g. "I want to learn to understand this better.")

Regulation of performance goals (RPG). Regulation of performance goals comprises thinking about getting extrinsic rewards or doing better than others (Wolters, 2003). Highlighted goals can be associated, for example, with high grades or approval from others (Wolters & Benzoni, 2013). (e.g. "I want to get the highest score.")

Environmental structuring (ES). Environmental structuring consists of reducing the probability of encountering distractions during study (Wolters, 2003). It implicates, for instance, decreasing the possibility of off-task behaviour or improving the readiness for study (Wolters & Benzoni, 2013). (e.g., "I go to study in a quiet room where I can concentrate.")

Regulation of value (RV). Regulation of value comprises thinking of the meaningfulness and usefulness of the studied tasks (Wolters, 2003). Student can use strategies to highlight the value of the studied task or material in the future (Wolters & Benzoni, 2013). (e.g., "I think up situations where it would be helpful for me to know this.")

The appropriate application of motivational strategies has been associated with higher effort, achievement, and performance in students (Schwinger et al., 2012). Smit et al. (2017), for instance, found a positive relationship between the use of motivational strategies and the value students attach to schoolwork,

as well as the effort they put into it and the pleasure they get from completing it. Furthermore, prior research has indicated that motivation regulation facilitates experiences of meaningfulness, enhanced learning, and persistence in learning situations among vocational education students (Smit, de Brabander, & Martens, 2014; Støen & Utvær, 2014). Motivation regulation also supports students' autonomy and the feeling of competence in educational settings and has a positive relationship with academic and vocational meaning (Smit et al., 2014; Støen & Utvær, 2014). This study focuses on five different motivation regulation strategies: self-consequating, regulation of performance and mastery goals, environmental structuring, and regulation of value. Furthermore, affiliations with motivation regulation strategies and study engagement, burn out, and academic performance are studied.

Changes in Motivation Regulation Levels and Learning Situations

It is often assumed that once learners have a good basic understanding of the relevant strategies and possess the appropriate skills, motivated learning just takes place organically. However, research into SRL has repeatedly shown that students do not always engage in regulating their motivation in learning, even when they possess the necessary skills (Winne & Jamieson-Noel, 2002). Learners are not always able or willing to apply effective learning strategies, such as motivation regulation, when they are needed in fluctuating learning situations, and thus give up in the face of difficulty (Winne & Jamieson-Noel, 2002). Students can also confront different motivational challenges in different situations and phases of their studies, and, therefore, the level of and need for motivation regulation can vary both within and between individuals (Engelschalk et al., 2017; Järvenoja, Volet, & Järvelä, 2013; Ketonen, 2017). Hence, recent studies have highlighted that the situational perspective of the regulation of learning can help us understand SRL processes (Greeno & Engeström, 2014; Hailikari & Parpala, 2014; Järvenoja, Järvelä, & Malmberg, 2015). Learning is not a stable state but takes place in constantly changing contexts; as such, it is exposed to situational dynamics in the time and place it occurs (Järvenoja et al., 2015; Pintrich, 2004; Urdan & Schoenfelder, 2006). If learners and teachers cannot realize adaptive motivation regulation in varying situations, they may fail to maintain motivated learning and engagement (Azevedo & Cromley, 2004; Hoops et al. 2016; Urdan & Schoenfelder, 2006).

Many things can affect motivation regulation processes, engagement and well-being, including learners' individual, behavioural, or mental actions (e.g. beliefs), social situations, and the circumstances of

pedagogical and learning environments (e.g., pedagogical guidance, interaction, study community, and communication technology) (Heggen & Terum, 2013; Järvenoja et al., 2015; Pietarinen, Soini, & Pyhältö, 2014). For instance, student-centred learning environments that consider learning as a constructivist, situated and social activity have shown to support students' achievement and motivational processes (Sarja, Janhonen, Havukainen, & Vesterinen, 2018; Smit et al., 2014). Contextual and social factors - such as a well-organised learning environment, teacher collaboration, teaching approaches that promote SRL and good teacher-student relations - have been positively associated with facilitating university students' motivation and learning (Hoops et al. 2016; Kunnari, Ilomäki & Toom, 2018; McMillan 2010; Ysuke, Parpala, Pyhältö, & Lindblom-Ylänne, 2016). Similarly, well-organized learning environments have been shown to elicit qualitatively better learning activities and outcomes than those of more informal learning environments, such as workplaces (Bakkenes, Vermunt, & Wubbels, 2010; Hailikari & Parpala, 2014). In addition, student-centered learning methods, cognitive complexity, and high-quality clinical learning environments have been shown to improve nursing students' learning and motivational resources (McComb & Kirkpatrick, 2016; Yardimci et al., 2017).

The prior research verifies that how learners engage in motivation regulation can vary across the situations and contexts. Accordingly nursing students' motivation regulation profiles are likely to change during their studies.

Role of Motivation Regulation in Nursing Students' Engagement and Burnout

Just as high-level self-regulative learning skills have been associated with student success, a lack of regulation has been shown to predict difficulties in studying, such as delayed graduation and the risk of dropping out (Hailikari & Parpala, 2014; Heikkilä, Lonka, Nieminen, & Niemivirta, 2012; McComb & Kirkpatrick, 2016; Vanthournout et al., 2012). For example, motivational and strategic aspects of SRL, such as appropriate self-efficacy and time management skills, are significant predictors of students' susceptibility to procrastination in academic work (Wolters, Won, & Hussain, 2017). Earlier studies of motivation regulation have shown a relationship with higher academic performance, better study engagement, and improved well-being (Boekaerts, 2011; Schwinger et al., 2012; Winne & Hadwin, 2012). On the contrary, diminished regulation skills may increase burnout symptoms, including the risk of exhaustion, especially during the first years of study (Litmanen, Loyens, Sjöblom, & Lonka, 2014).

Study-related exhaustion, cynicism, and feelings of inadequacy are all connected to the concept of study burnout (e.g., Parker & Salmela-Aro, 2011; Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). The relationship between the symptoms has been described as complex; however, exhaustion and cynicism are provably regarded as core dimensions of burnout (Bresó, Schaufeli, & Salanova, 2011; Maslach, 2003; Schaufeli & Taris, 2005). Study-related emotional exhaustion is considered a distinctive symptom of study burnout that is a result of perceived high study demands, the development of cynicism (i.e., cynical and detached attitudes toward study), and feelings of inadequacy (Salmela-Aro & Read, 2017; Schaufeli et al., 2002). Study-related exhaustion can also be described as feelings of strain, stress, and chronic fatigue, while study-related cynicism is an indifferent or distant attitude towards studying and the loss of interest and meaning in academic work (Salmela-Aro & Read, 2017).

Burnout, in the context of study, can lead to serious problems, both during the period of study and later in life (e.g., Upadyaya & Salmela-Aro, 2013). It has been pointed out that especially nursing students suffer from increased levels of stress during their studies (Bartlett et al., 2016). Nursing students experiencing study burnout has been reported as a predictor of decreased academic performance, occupational preparedness, and future clinical performance (see Pitt, Powis, Levett-Jones, & Hunter, 2012; Rudman & Gustavsson, 2012). Based on the literature review by Walker, Rossi, Anastasi, Gray-Ganter and Tennent (2016), nursing students have expressed greater feelings of satisfaction, commitment, and motivation in their studies when they have felt included and supported. As a result, the study authors recommend that authentic and engaging learning opportunities and environments should be ensured for nursing students. In addition, to aid student success, support, guidance, and information services should be provided to all students. Facilitating a social presence in online courses, providing flexible modes of learning, and assisting students' critical thinking abilities and strategies can contribute to nursing students' motivation in their studies (Walker et al., 2016).

Similar to study burnout, study engagement is also related to affective components of engagement (Upadyaya & Salmela-Aro, 2013). It is further characterized by a combination of study-related vigor, dedication, and absorption (Salmela-Aro & Upadaya, 2012; Schaufeli et al., 2002). Vigour refers to high levels energy, mental resilience, persistence and willingness to invest effort to one's work while studying. Dedication describes the sense of significance, inspiration, and involvement achieved through studying; and absorption characterizes full concentration and engrossment, or the state of being

happily and singularly focused on studying (Salanova, Llorens, & Schaufeli, 2011; Salmela-Aro & Upadaya, 2012; Schaufeli et al., 2002). It has been suggested that implementing pedagogical activities that promote students' psychological processes and motivation regulation strategies (e.g., self-efficacy, time management, and goal setting) can increase students' overall engagement and performance (Bresó et al., 2011; Wolters & Hussain, 2017). Furthermore, students' active roles in learning situations—such as interaction with peers and supervisors, team-based learning, homework and online task competition, lecture attendance, and study hours—have been referred to as pivotal factors in enhancing engagement and academic performance (Heggen & Terum, 2013; Mackintosh-Franklin, 2018).

Recent research has focused simultaneously on study-related burnout and engagement (e.g., Salmela-Aro & Upadaya, 2012; Salmela-Aro & Read, 2017). A longitudinal study completed by Tuominen-Soini and Salmela-Aro (2014) explored school-related burnout and school engagement among high school students ($n = 979$). Their study revealed four rather stable profiles over time: engaged, engaged–exhausted, cynical, and burned-out. Both engaged and engaged–exhausted students were committed, were motivated, and performed well in school, taking into account that engaged–exhausted students were more stressed and preoccupied with possible failures. Conversely, cynical and burned-out students valued school less and had lower academic achievement. The profiles seemed to be stable from adolescence to young adulthood. It was most typical for engaged students to stay in engaged groups, yet engaged–exhausted students often moved into more disengaged groups over time. The study also found a difference in students' long-term educational attainment, indicating that the engaged students had the highest educational aspirations and were more likely to attend universities and that engaged–exhausted students were more likely to attend universities of applied sciences (Tuominen-Soini & Salmela-Aro, 2014).

To conclude, motivation regulation, study engagement, and study burnout are each made up of various elements (e.g., situational and emotional dimensions) and have an impact on learning and study success, which are closely related and partly intertwined. Furthermore, motivation and emotional regulation have been referred to as inherent parts of self-regulation in collaborative learning situations (Järvenoja, Järvelä, & Malmberg, 2017). An overview of this literature reveals that an examination of nursing students' motivation regulation skills and their associations with students' study burnout, engagement, and academic achievement would increase our understanding of undergraduate nursing students' learning and unveil advantageous implementations within professional higher education.

Aims

This study explores the variation in nursing students' motivation regulation, study burnout, and study engagement from the first to second year of study. Furthermore, it investigates their associations with academic performance (entrance examination score, grade point average [GPA] and completed credits) in traditional and blended learning (BL) environments. The longitudinal approach provides the opportunity to follow and focus the progress and changes in individuals' functioning and development over time (Bergman & Trost, 2006). Hence, this study examines development of students' motivation regulation profiles during two years. The research questions are as follows:

- (1) What kind of motivation regulation profiles, study engagement, and study burnout can be detected among second-year nursing students?
- (2) How does the motivation regulation, study engagement, and burnout associate with students' academic performance?
- (3) How do nursing students' motivation regulation profiles, study engagement and burnout progress from the first year to the second year?

Methods

In Finland nursing education is carried out in Universities of Applied Sciences (UAS) and follows the European Union's training requirements for general care nurses (Directive 2005/36/EC; Directive 2013/55/EU). The requirement for admission is a secondary general or vocational education certificate. The final student selection is based on earlier study success and the university's own entrance examination, which usually includes writing and mathematical skills tests and an aptitude test. It takes approximately three and a half years to graduate as a registered nurse (Bachelor of Health Care degree).

The nursing degree program comprises 210 European Credit Transfer and Accumulation System (ECTS) credits and can be completed either in a traditional classroom-based program or in a BL program. Blended learning combines pedagogically planned face-to-face and online activities, as well as synchronous and asynchronous activities and technologies (Galvis, 2018). It integrates the advantages of traditional classroom learning with online and offline learning and aims to enhance learning success (Cheung, Kwok, Kubota, Lee, & Tokito, 2018). In the traditional program, nursing students take part in face-to-face classroom teaching weekly; in the BL program, students attend a classroom approximately one week (4-

5 days) per month and otherwise study wherever and whenever they choose using tutors and technology-enhanced, web-based, online learning management systems. Both programs include the same amount of clinical training in practical placements (90 ECTS).

The Finnish national credit allocation and accumulation system is equivalent to the ECTS, and one year of full-time study corresponds to 60 credits (European Union, 2015). Completed courses are evaluated numerically on the scale excellent (5), good (3–4), satisfactory (1–2), and fail (0).

Data Collection

A cross-sectional and longitudinal approach were used to obtain survey data from the sample of undergraduate nursing students in UAS. The first and second survey data were collected via questionnaires by the researcher during a lecture. The first quantitative survey study was conducted at the beginning of the nurse education program (February 2016). Altogether, 90 first-year baccalaureate nursing students participated in the first study. The second quantitative survey (N=98) was carried out at the beginning of the second year (February 2017), which is halfway through the program. The online survey was sent via email to students who did not attend the lecture. The participants were informed about the study and their rights, including voluntary participation and the researcher's commitment to ensuring anonymity and confidentiality, and the fact that any decision concerning their participation would have no effect on their studies.

The students' GPAs for their completed courses, number of accomplished credit units, and entrance examination results were received from the university's administrative register. The study was approved by our institution's review board, and permission was obtained from the director of education, research, development and innovation in health care and nursing education.

Participants

Altogether, 98 second-year nursing students (83 women, 84.7%; 15 men, 15.3%) from UAS in northern Finland participated in the second quantitative survey study. The sample consisted of all the second-year baccalaureate nursing students in two separate degree program units. The response rate was 90.7%. Their ages ranged from 21 to 51 years ($M = 28.31$, $SD = 6.83$). Thirty-four of the participants studied in a BL environment, whereas 64 students studied in a traditional learning environment. A slight minority (48.0%) of the students were not working during their studies, whereas 45.9% had part-time jobs and 6.1% full-time jobs. The groups differed from

each other in terms of their employment status. In the BL group, most students were working (64.7%, $n = 22$), whereas in the traditional learning group approximately half of the students 54.7%, $n = 35$) did not work in addition to completing their studies while the other half did. The response rate of the same students participating in both the first and second survey was 87.3% ($n = 69$). All longitudinal data were analyzed using this n , whereas the cross-sectional data of $n = 98$ was used in all other analyses.

Measurement

The first and second survey contained three scales, which have been used in prior studies with different population-validated scales. The motivation regulation scale (26 items) included subscales for the regulation of performance goals (RPG; five items), self-consequating (SC; five items), regulation of value (RV; six items), environmental structuring (ES; four items), and regulation of mastery goals (RMG; six items) (Wolters & Benzon, 2013). The study engagements scale (nine items) comprises vigor (three items), dedication (three items), and absorption (three items) (Schaufeli, Bakker, & Salanova, 2006; Schaufeli et al., 2002). The study burnout scale (eight items) consists of exhaustion (five items) and cynicism (three items) (Maslach, Schaufeli, & Leiter, 2001; Salmela-Aro, Kiuru, Leskinen & Nurmi, 2009; Salmela-Aro & Näätänen, 2005). All three scales and items are presented in the Appendix.

Respondents were instructed to indicate agreement with each item using the seven-point Likert scale, ranging from strongly disagree (1) to strongly agree (7). Four demographic questions concerning respondents' gender, age, employment status, and parenthood of underage dependents were added in the survey.

Analysis

After checking the normality of the variables, exploratory factor analysis (EFA) with maximum likelihood extraction was used to probe the underlying structure of the variables of motivation regulation, study engagement, and study burnout. As for the motivation regulation scale, results suggested that a five-factor solution for the motivation regulation scale should be retained, including RPG, RMG, SC, ES and RV.

For the study engagement scale, a one-factor solution seemed most plausible, and for the study burnout scale variables, a two-factor structure of cynicism (three items) and exhaustion (five items) was supported by the analyses. To create motivation regulation clusters and to determine their number, a K-means analysis was conducted. Two- and three-cluster procedures were tested. Based on the relatively small number of respondents ($n = 98$), the two-cluster

Table 1
Cronbach's Alphas, Means, Standard Deviations, And Minimum and Maximum Values on Motivation Regulation, Study Engagement, Study Burnout and Academic Performance (N = 98)

Items/Scales	N of items	Alpha	Mean	SD	Min	Max
Motivation regulation						
Regulation of performance goals	5	.87	4.25	1.24	1.60	7.00
Self-consequating	4	.91	4.46	1.47	1.00	7.00
Regulation of value	6	.87	5.25	.99	2.17	7.00
Environmental structuring	3	.89	4.94	1.20	2.00	7.00
Regulation of mastery goals	3	.72	3.80	1.09	1.33	6.33
Study Engagement	9	.90	4.28	1.00	1.67	6.56
Study Burnout						
Exhaustion	7	.83	3.26	1.19	1.14	6.57
Cynicism	5	.88	2.25	1.19	1.00	6.20
Academic performance						
GPA	1	-	3.14	.62	.00	4.64
Credits	1	-	102.69	21.16	13.00	135.00
Entrance examination	1	-	79.62	5.78	63.0	93.0

solution was selected. Independent t-tests were used to compare groups when the dependent variables were measured at least at an interval level, and repeated measures t-tests were used to examine the differences between the first measures and second measures. Linear regression analysis was used to examine the relationships between students' motivation regulation subscale scores and GPA and between students' entrance examination scores and GPA. Because there were no differences between students' motivation regulation profiles, engagement, burnout, or academic performance based on their learning environment, both learning environment groups are processed together in the analysis. All data analyses were carried out using SPSS version 24 (2016).

Results

Second-Year Nursing Students' Motivation Regulation Profiles, Study Engagement and Study Burnout, and Associations with Academic Performance

The results indicated that second-year nursing students displayed high or moderate levels of motivation regulation, ranging from $M = 3.80$ for RMG to $M = 5.25$ for RV. They also displayed a moderate level of study engagement. In terms of study burnout, the students reported a moderate level of exhaustion but low level of cynicism (see Table 1).

Linear regression analyses indicated that, of the motivation regulation variables, only SC predicted GPA ($b = .16$, $t(97) = 3.82$, $p < .001$), explaining a significant proportion of the variance in GPA scores ($R^2 = .13$,

$F(1,96) = 14.62$, $p < .001$). Also, entrance examination score had a positive relationship with GPA ($b = .04$, $t(97) = 3.73$, $p < .001$), explaining a significant proportion of the variance in GPA scores ($R^2 = .15$, $F(1,96) = 13.89$, $p < .001$). There was no relationship between study engagement and academic performance nor between experiencing study burnout and academic performance.

Progress of Motivation Regulation Profiles, Study Engagement and Study Burnout from First Year to Second Year

One of the research questions aimed to examine the progression of motivation regulation, study engagement and study burnout over time. K-means cluster analysis, using the subscale scores of the motivation regulation scale of the first measurements' point, enabled the detection of two distinctive student profiles. The first motivation regulation profile culled from our analysis was students with a high level of motivation regulation. This was the most common profile among the nursing students, with a 66.7% ($n = 46$) sample share. As displayed in Figure 1, these students displayed high levels of RPG, RMG, SC, ES and RV. The second profile, which showed less-developed motivation regulation, displayed lower motivation regulation levels in all motivation regulation scales and represented slightly over one-third (33.3%, $n = 23$) of the nursing students in the sample.

Using our second measurement data, the same analysis again revealed two distinctive student profiles. The most common profile was still students with high levels of motivation regulation (62.3%, $n = 43$), including high levels of RPG, RMG, SC, RV and ES.

Figure 1.
The first measurement motivation regulation profiles

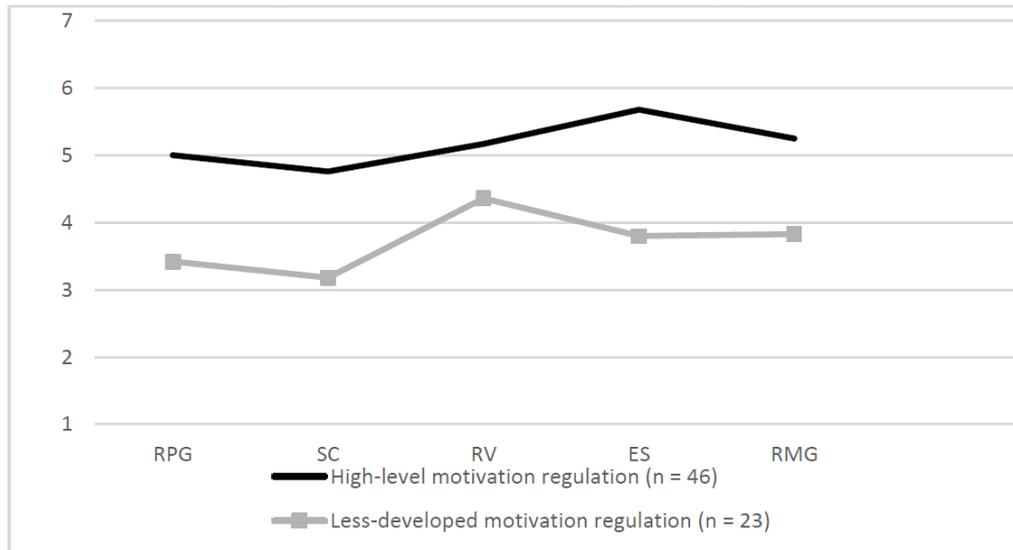
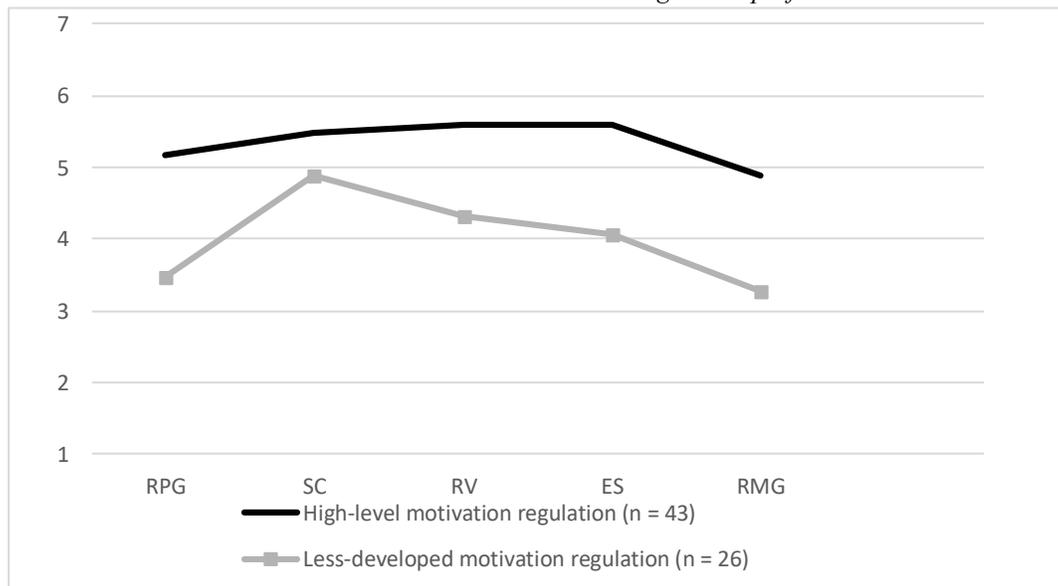


Figure 2.
The second measurement motivation regulation profiles



The second profile was, similarly, the less-developed motivation regulation profile, representing slightly over one-third (37.7%, $n = 26$) of the nursing students in the sample. The less-developed motivation regulation profile holders showed moderate levels of RPG, RMG, SC and ES and a slightly lower level of RV (see Figure 2). The profiles, thus, seem to be rather stable over time.

As Table 2 indicates, there were some differences between the first measurement and second

measurement in terms of RV, RMG, study engagement, and cynicism. Also, small differences were observed in SC and exhaustion between the two measurements. The students' reported RV increased, as did SC, exhaustion and cynicism (see Table 2). Conversely, the reported RMG and study engagement decreased over time. No meaningful changes were detected in students' responses concerning the strategic use of ES.

The profile of second-year nursing students with high levels of motivation regulation ($n = 43$, $M = 4.56$,

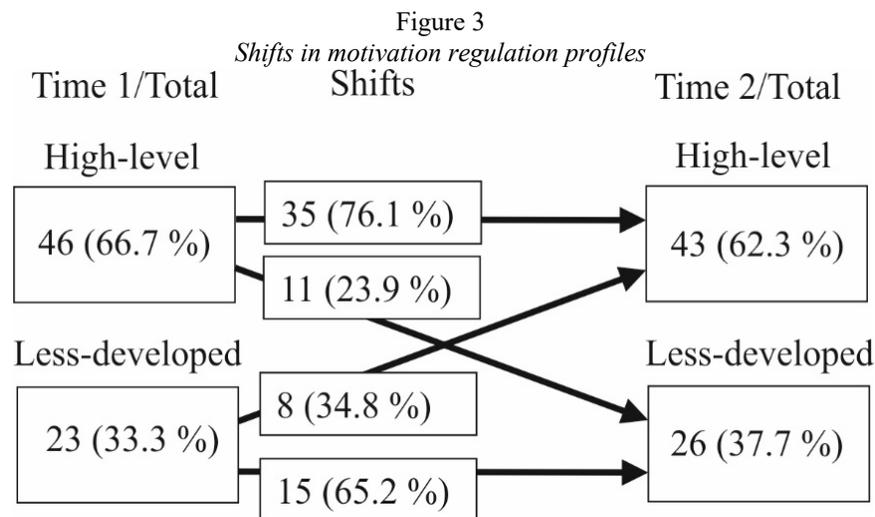
SD = .91) displayed higher levels ($t(96) = -3.60, p = .001$) of study engagement than did the less-developed profile ($n = 26, M = 3.86, SD = 1.00$). There were also differences in cynicism ($t(69.15) = 2.72, p = .008$) and GPA ($t(74) = -2.28, p = .026$) between the two profiles: students with high-level motivation regulation skills displayed less cynicism ($M = 1.98, SD = 1.04$) and had a higher GPA ($M = 3.27, SD = .56$) than students with less-developed motivation regulation skills ($M = 2.65, SD = 1.30$ and $M = 2.98, SD .47$, respectively).

Shifts within both profiles over time were also analyzed, and four types of motivation regulation

progression paths were detected. As Figure 3 indicates, shifting from less-developed motivation regulation to high-level motivation regulation from the time of the first measurement to the time of the second was more typical than the opposite: approximately one-third of those with less-developed motivation regulation at measurement time one had shifted to a high level at time two. Only approximately one-quarter of those with high-level motivation regulation had shifted to the less-developed level at time two. We found no statistically significant differences between those who had shifted profile and those who had not.

Table 2
Means Scores of MR, Study Engagement, Study Burnout Scale Scores Over Times 1 and 2

	First Measurement (n = 69)		Second Measurement (n = 69)		t	p
	M	SD	M	SD		
Motivation Regulation						
Regulation of performance goals	4.48	1.22	4.30	1.25	1.38	.172
Self-consequating	4.23	1.35	4.50	1.43	-2.01	.048
Regulation of value	4.90	1.05	5.31	.94	-3.70	<.001
Environmental structuring	5.05	1.40	5.05	1.24	-0.03	.973
Regulation of mastery goals	4.77	1.24	3.87	1.05	5.93	<.001
Study Engagement	5.92	1.35	4.35	1.03	15.98	<.001
Study Burnout						
Exhaustion	2.99	1.22	3.28	1.25	-2.45	.017
Cynicism	1.70	.88	2.30	1.27	-4.97	<.001



Discussion

This longitudinal study focused on investigating the progress of undergraduate nursing students' reported use of different motivation regulation strategies, engagement, and risk of suffering from burnout. The affiliations of these strategies with academic performance were also studied. First, the results indicated that a majority of the students displayed high or moderate levels of motivation regulation and moderate levels of study engagement in both the first and second year of their studies. In terms of their risk to suffer from study burnout, the results showed that while the second-year students experienced moderate levels of exhaustion, most of the students still reported only low levels of cynicism. The findings are in line with earlier studies, which indicated that highly engaged and motivated students can simultaneously experience feelings of exhaustion (Salmela-Aro & Read, 2017; Tuominen-Soini & Salmela-Aro, 2014). Accordingly, the present study highlights that educators should continue to support students even when they display a relatively high level of motivation and engagement since they are still susceptible to feelings of study-related exhaustion and stress (Tuominen-Soini & Salmela-Aro, 2014). The fact that this longitudinal study revealed at both measurement points two distinctive motivation regulation profiles strengthens the idea that students are not homogeneous group but instead possess different levels of motivational regulation throughout their studies (Engelschalk et al., 2017; Ketonen, 2017; Mäenpää, Pyhältö, Järvenoja & Peltonen, 2018; Schwinger et al., 2012).

Second, this study found a relationship between an overall high level of motivation regulation and academic performance (GPA). This is in line with studies that have indicated that the appropriate use of motivational strategies results in higher levels of achievement (Schwinger et al., 2012; Smit 2017). Differing from earlier studies (Schwinger et al., 2012; Smit, 2017), this study revealed a relationship between higher levels of motivation regulation in terms of SC and higher academic performance. This finding demonstrates an even greater positive impact of persistent self-talk, such as promising oneself a reward for completing the assigned work or reaching the set goal (McMillan, 2010; Wolters & Benzon, 2013). In addition, and parallel to earlier studies, a higher entrance examination grade was shown to be a predictor of higher academic performance in nursing students (Wolkowitz & Kelley, 2010).

Third, the longitudinal approach demonstrated some changes in students' individual motivation regulation profiles, meaning the profiles are not permanent. Four different profile paths were uncovered:

two stable profiles consisting of students staying either in the high or less-developed motivation regulation profile over time and two changing profiles consisting of students who shifted either from the high-level motivation regulation profile to less-developed level or vice versa. With respect to the original profile groups, there were more students shifting from the less-developed motivation regulation profile to the higher-level motivation profile over time. This result is in line with the idea that individuals' levels of motivation regulation should not be regarded as a stable state; instead, students with different motivational approaches can modify their use of motivation regulation strategies to fit the situational challenges they encounter during their course of study (Järvenoja et al., 2015). This leads to the question of whether certain aspects of individuals' SRL skills, and in situational contexts, can be uncovered to specifically influence motivation regulation. What contributes and maintains successful motivation regulation despite varying situations and competing motivational challenges? Considering that there were reciprocal changes in the profiles, it is important to proceed by exploring the factors that strengthen or weaken motivation regulation. It would help to understand how students' motivation regulation and commitment to learning can be scaffolded and, also, to widen the research approach in essential situational contexts (Greeno & Engeström, 2014; Järvenoja et al. 2015).

The current study was carried out at one university of applied sciences in northern Finland with a relatively small sample of participants from a single discipline and cultural context. The response rate of the cohort was quite high, and longitudinal results test the stability of the results reported in this study. However, the longitudinal design created four different types of motivation regulation profiles, and as a result, the number of students within each profile or the number of profile shifters is not that high. As such, because of the sample size and analytical approach used, the results should be considered with caution, particularly in terms of making generalizations. Bearing this limitation in mind, the current study did reveal that students can engage in different types of learning paths in terms of their motivation regulation. While a good number of students successfully maintained high engagement and motivation regulation between the two measurement points, there were groups of students who remained at low levels of motivation or who experienced something that caused their commitment and motivation regulation to dwindle. In the future, there is a need for additional studies that implement multiple methods and approaches in studying undergraduate nursing students' motivation regulation in action, in order to gain a deeper understanding of the causes of the levels of

engagement and motivation regulation, both high and low. Further research using interpretive qualitative approaches could provide more insight into the individual and situational factors that contribute to nursing students' motivation regulation. As motivation regulation research in professional higher education for nurses is still scarce, this study offers a less frequently examined addition to the empirical research on motivation regulation.

In endeavouring to support students' learning, it is also necessary to consider that educators can help their students maintain and bolster their motivational regulation strategies, such as by tailoring their learning environment structures, providing assistance with goal setting and applying support and peer interaction techniques (Hoops et al. 2016; Schunk 2014; Urdan & Schoenfelder, 2006). Receiving social and motivational support both during their studies and in their transition from nursing study to nursing practice will also help ensure more nurses choose to stay in the profession (Bartlett et al., 2015; Flinkman & Salanterä, 2015). Without a supportive learning environment and attention paid to the enhancement of their motivational regulation skills, students can feel overloaded and find it difficult to engage in studies or successfully meet the scholarly and practical demands of the course (Bronson, 2016; Khalaila, 2015; Nesje, 2015).

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Appendix

Motivation regulation scale and items (Wolters & Benzon, 2013).

Scale	Items
Regulation of value	<p>I think up situations where it would be helpful for me to know the material or skills.</p> <p>I try to make the material seem more useful by relating it to what I want to do in my life.</p> <p>I make an effort to relate what we're learning to my personal interests.</p> <p>I try to connect the material with something I like doing or find interesting.</p> <p>I tell myself that it is important to learn the material because I will need it later in life.</p> <p>I try to make myself see how knowing the material is personally relevant.</p>
Regulation of performance goals	<p>I remind myself about how important it is to get good grades.</p> <p>I think about how my grade will be affected if I don't do my reading or studying.</p> <p>I remind myself how important it is to do well on the tests and assignments in this course.</p> <p>I convince myself to keep working by thinking about getting good grades.</p> <p>I tell myself that I need to keep studying to do well in this course.</p>
Self-consequating	<p>I promise myself some kind of a reward if I get my readings or studying done.</p> <p>I make a deal with myself that if I get a certain amount of the work done I can do something fun afterwards.</p> <p>I tell myself I can do something I like later if right now I do the work I have to get done.</p> <p>I set a goal for how much I need to study and promise myself a reward if I reach that goal.</p> <p>I promise myself I can do something I want later if I finish the assigned work now.</p>
Environmental structuring	<p>I try to get rid of any distractions that are around me.</p> <p>I make sure I have as few distractions as possible.</p> <p>I change my surroundings so that it is easy to concentrate on the work.</p> <p>I try to study at a time when I can be more focused.</p>
Regulation of mastery goals	<p>I persuade myself to keep at it just to see how much I can learn.</p> <p>I tell myself that I should keep working just to learn as much as I can.</p> <p>I challenge myself to complete the work and learn as much as possible.</p> <p>I convince myself to work hard just for the sake of learning.</p> <p>I tell myself that I should study just to learn as much as I can.</p> <p>I eat or drink something to make myself more awake and prepared to work.</p>

Study engagement scale and items (Schaufeli, Bakker, & Salanova, 2006; Schaufeli, Martinez, Pinto, Salanova & Bakker, 2002).

Scale	Items
Vigor	In my studies, I feel like I am bursting with energy. In my studies, I feel strong and vigorous. When I get up in the morning, I feel like going to study.
Dedication	I find studying full of meaning and purpose. I am enthusiastic about my studies. Studying inspires me.
Absorption	Time flies when I am studying. When I am studying, I forget everything else around me. I am immersed in my studying.

Study burnout scale and items (Maslach, Schaufeli, & Leiter, 2001; Salmela-Aro, Kiuru, Leskinen & Nurmi, 2009; Salmela-Aro & Nätänen, 2005).

Scale	Items
Exhaustion	I feel overwhelmed by my schoolwork. I often sleep badly because of matters related to my schoolwork. I feel totally exhausted. I brood over matters related to my schoolwork a lot during my free time. The pressure of my schoolwork causes me problems in my close relationships with others.
Cynicism	I feel a lack of motivation in my schoolwork and often think of giving up. I feel that I am losing interest in my schoolwork. I'm continually wondering whether my schoolwork has any meaning.