# Motivation to Study in a Family Medicine Curriculum (Year 5) at Saarland University

## Lernmotivation im Kurs Allgemeinmedizin (5. Jahr) an der Universität des Saarlandes

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### Background

A new competency-based blended-learning Family Medicine curriculum was implemented at Saarland University in 2020. Based on self-determination theory, this study aims to measure and compare the motivation of medical students to study within medical school in general and within the Family Medicine curriculum.

### Methods

This explorative study consists of two quantitative questionnaires that were given to one cohort of medical students in a time interval of two months. The first questionnaire focuses on motivation to study medicine in general and the second questionnaire focuses on students' motivation regarding the Family Medicine curriculum at Saarland University. Students' motivation was compared between both settings. Separately, sociodemographic background, self-efficacy, perceived competence and perceived autonomy were correlated to autonomous motivation to figure out specific motivators for Family Medicine education.

### Results

Out of 92 students enrolled during the winter semester 2020/21, 86 students participated in the first and 55 students participated in the second survey. Students showed higher scores of autonomous motivation for medical school in general compared to the Family Medicine curriculum (p = 0.015). For Family Medicine perceived competence showed a strong correlation with autonomous motivation (p < 0.001).

### Conclusions

Students' motivational setup towards medical school differs from their motivational setup towards the individual Family Medicine subject. Perceived competence of students appears to play an important role in fostering autonomous motivation for Family Medicine as a subject. Competency-based medical education in Family Medicine might be an option to purposefully foster perceived competence in medical students. This might align well with the changes suggested by the National Competency-Based Learning Outcome Catalogue for Medicine.

### Keywords

family medicine; self-determination theory; motivation; undergraduate medical education

### Hintergrund

2020 wurde an der Universität des Saarlandes ein neues kompetenzorientiertes blended-learning Curriculum für das 5. Studienjahr umgesetzt. Basierend auf der Self-determination Theory vergleicht diese Publikation die Studiermotivation bezogen auf das Medizinstudium und die Lernmotivation im Allgemeinmedizincurriculum der Universität des Saarlandes.

### Methoden

Diese explorative Studie basiert auf zwei quantitativen Fragebögen, die im Abstand von zwei Monaten derselben Studienkohorte gestellt wurden. Der erste Fragebogen erfasst die Motivation im Medizinstudium, der zweite Fragebogen erfasst die Motivation im Allgemeinmedizincurriculum. Die studentische Motivation wurde zwischen beiden Settings verglichen. In beiden Settings wurden der soziodemografische Hintergrund, die Selbstwirksamkeit, die empfundene Kompetenz und die empfundene Autonomie mit autonomer Motivation korreliert, um Spezifika für die allgemeinmedizinische Lehre auszuarbeiten.

### Ergebnisse

Im Wintersemester 2020/21 nahmen 92 Studierende am Allgemeinmedizincurriculum teil. Davon nahmen 86 Studierende am ersten und 55 Studierende am zweiten Fragebogen teil. Im Vergleich zum Allgemeinmedizincurriculum, zeigten Studierende höhere Werte an autonomer Motivation im Medizinstudium (p = 0,015). Für den Kurs Allgemeinmedizin zeigte sich eine starke Korrelation zwischen autonomer Motivation und empfundener Kompetenz (p < 0,001).

### Schlussfolgerungen

Die Motivation von Studierenden im Medizinstudium generell und im Kurs Allgemeinmedizin unterscheidet sich. Die empfundene Kompetenz der Studierenden scheint eine wichtige Rolle bezüglich der autonomen Motivation für den Allgemeinmedizinkurs zu spielen. Die kompetenzorientierte allgemeinmedizinische Lehre im Sinne des Nationalen Kompetenzbasierten Lernzielkatalogs Medizin könnte vorteilhaft für das Kompetenzgefühl in Medizinstudierenden und so auch für die autonome Motivation sein.

### Schlüsselwörter

Allgemeinmedizin; Self-determination Theory; Motivation; Medizinstudium

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## Background

Due to the educational changes suggested by the National Competency-Based Learning Outcome Catalogue for Medicine (NKLM) that come into effect with the new medical licensing regulations in 2025, Family Medicine departments may soon face a large increase in teaching responsibilities in German Medical Schools. New learning activities may need to be created in a short period of time. Thinking about how to promote learning in Family Medicine will therefore be an important aspect of medical educational design in Family Medicine departments. Research has shown that motivation to study for specific subjects may not necessarily be as high as the initial voluntary wish to study Medicine as a university course [1].

The importance of fostering autonomous motivation to enhance students' learning has played a major role in recent medical education curriculum design research [2, 3]. Literature shows that autonomous motivation leads to deeper learning strategies, better performance and supports lifelong learning in students [4, 5, 6].

There are different types of motivation, as described by Ryan and Deci's Self-determination Theory (SDT) [4]. Medical education research differentiates between autonomous motivation, controlled motivation and amotivation [5]. Autonomous motivation is characterized by the development of a genuine interest to learn and develop, independent of external influences [5]. It is the most self-determined form of motivation [4]. Studying out of an internal causality is said to be the most effective way of learning [4, 7]. Students that show controlled motivation pursue an activity out of obligation or for reward and not out of an internal causality [4, 6]. Amotivational behavior in education is characterized by a lack of motivation to study, not seeing a point in learning [8, 9].

Motivation in medical education can be viewed as an independent or as a dependent variable [6, 10]. Kusurkar et al. (2011) and Orsini et al. (2016) published systematic reviews on predictors and outcomes of motivation in the light of SDT [6, 10]. Predictors of motivation can be divided

into variables that cannot be manipulated and variables that can be manipulated [10]. Variables that cannot be manipulated include sociodemographic factors (for example age, gender) as well as personality traits (for example persistence, readiness to start) [6, 10]. Variables that can potentially be manipulated include academic conditions as well as the "three innate psychological needs" as defined by SDT: autonomy, competence and relatedness [6, 11]. Accordingly, autonomous motivation can be fostered when students receive autonomy support by instructors, meaning students may plan their learning on their own within defined boundaries [10]. The experience of successful learning progress can raise a students' feeling of competence [10, 11, 12]. Closely related to competence is self-efficacy, a key construct of Social cognitive theory. Self-efficacy is the belief in one's capability to execute a task and influence its outcome as an individual [13]. It is also said to interact with and influence motivation [3]. Relatedness, the third factor of SDT, concerns the feeling of being related to others such as peers and teachers within a specific field [10].

Motivation in turn has shown to have a clear impact on learning, measurable in academic success, performance and academic engagement as

### Abbreviations

**AMS:** Academic Motivation Scale
**FMC:** Family Medicine curriculum
**LCQ:** Learning Climate Questionnaire
**MS:** Medical School
**N:** Number
**NGSE:** New General Self-Efficacy Scale
**NKLM:** National Competency-Based Learning Outcome Catalogue for Medicine (Nationaler Kompetenzbasierter Lernzielkatalog Medizin)
**PCS:** Perceived Competence Scale
**Q1:** Questionnaire 1
**Q2:** Questionnaire 2
**SD:** Standard deviation
**SDT:** Self-determination Theory
**UdS:** Saarland University (Universität des Saarlandes)
**vs.:** versus

dependent variables [6, 10]. According to Kusurkar, "enhancing autonomous motivation of students should be an integral part of the educational philosophy of a medical school if we want to produce doctors of the future" [2]. The development of "students for life" who are constantly investing in their continuing medical education should be an important aim of medical schools and their curricula [5].

In October 2020 a new Family Medicine curriculum (FMC) was implemented at Saarland University (UdS) for year five students. The overarching learning objective is to acquire all needed competencies to independently manage a patient in a Family Medicine practice, while always being on the lookout for potentially dangerous conditions (red flags). The focus of the curriculum lies on learning competencies, as proposed by the NKLM. Students learn the cognitive content of three typical Family Medicine-associated symptoms: abdominal pain, febrile infection, and back pain based on self-directed learning. Students study each of the three theoretical blocks with a variety of digital media, provided via a central course landing page (https://amuh.amboss.com/amuh.html). At the end of each block students actively practice Family Medicine patient management (decision-making-process) in simulation seminars.

This study tries to describe and assess the distribution of motivation within a compulsory year five FMC and Medical School (MS) as a whole. For each entity, correlations between previously in literature described predictors of autonomous motivation are assessed and compared. This might help to figure out specific motivators for Family Medicine education.

## Methods

### Participants and setting

Study participants were medical students in their fifth academic year at UdS in winter semester 2020/21 (N = 92). Students had to consent to study participation and personal data storage at the beginning of the semester (October 2020) via an online questionnaire to be included. Stu-

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| | Q1 | Q2 |
|---|---|---|
| **Time** | Beginning of the semester | End of the semester |
| **Objective** | Motivation in MS | Motivation in the FMC |
| **Number of participants** | N = 86 (93.5 %) | N = 55 (59.8 %) |
| **Tools** | Sociodemographic data AMS PCS NGSE | AMS PCS LCQ |

AMS= Academic motivation scale, PCS= Perceived Competence scale,
NGSE= New General Self-Efficacy Scale, LCQ= Learning Climate Questionnaire

**Table 1** Study design and tools used in the questionnaires

dents' last returned version was counted. If items of a category were not answered fully, participants were excluded from this category. Ethics approval was obtained by Saarland medical association ethics committee on 25.09.2020 (Bu 234/20).

## Study design and data collection

This is an explorative, quantitative study including two questionnaires (Q1, Q2).

Q1 and Q2 were given to the entire cohort at two consecutive moments with an interval of two months. Q1 and Q2 investigate medical students' autonomous and controlled motivation as well as amotivation towards MS (Q1) and the FMC (Q2). The questionnaires were available online on the FMC's homepage. Q1 was available from 11.10. to 10.11.2020 during the course registration period and recorded motivation, perceived competence for learning, and self-efficacy of medical students regarding MS in general. Q2 was available at the middle/end of the FMC from 01.12.2020 to 16.01.2021 and recorded motivation, perceived competence for learning and perceived autonomy regarding the FMC at UdS. The Q1-Q2 setup allowed students to answer questions on one setting (MS vs. FMC) at a time, while avoiding conceptual overlap. After assigning results of Q1 and Q2, data was anonymized.

Previously validated questionnaire tools were translated into German and adapted to the setting (Q1: MS, Q2: FMC). All scales contained a seven-point Likert scale (1 = does not correspond at all, 7 = corresponds exactly). The tools used were:

The Academic Motivation Scale (AMS) uses 28-items to assess seven subscales of motivation (four items for each subscale): The seven subscales were assessed by adding up students' scores on each of the four subscale-associated items. Autonomous motivation consists of the subcategories: intrinsic motivation to know, toward accomplishment and to experience stimulation as well as extrinsic motivation-identified (four subscales) [8, 10]. Controlled motivation consists of extrinsic-introjected and extrinsic-external regulation (two subscales) [8, 10]. Amotivation consists of one correspondent/corresponding subscale. Students' scores of autonomous and controlled motivation were calculated by averaging students' scores of the respective subscales. The higher the score, the more autonomously or controlled motivated or else amotivated is a student.

The Perceived Competence Scale (PCS) uses four items to measure students' perception of learning competence [14].

The New General Self-Efficacy Scale (NGSE) consists of eight items to measure student's self-efficacy [15]. The original five-point Likert Scale was expanded to a seven-point Likert Scale to maintain uniformity within the questionnaires.

The Learning Climate Questionnaire (LCQ) uses six items to measure students' perception of autonomy support [14]. A students' score (1–7) on the PCS, NGSE and LCQ was calculated by averaging his or her responses. The higher the mean score, the higher the students' perceived competence, self-efficacy, or perceived autonomy.

Additionally, Q1 collected sociodemographic data namely age, gender, children, study delay, previous professional vocational training, working besides the degree, intended specialty training and preferred learning style.

Q1 and Q2 had a very similar setup (table 1). In Q1 self-efficacy (NGSE) was investigated instead of perceived autonomy (LCQ). The LCQ is typically used for specific learning settings, like a single class or subject, whereas NGSE tends to evaluate longer time frames, like in a medical curriculum [14].

Based on previous publications on predictor-outcome relations, correlations of sociodemographic data, perceived competence, autonomy, self-efficacy and autonomous motivation were compared between MS and the FMC.

## Data analysis

Analyses were performed using Jamovi (Version 1.6) and JASP (Version 0.14.1), power analysis was conducted using jpower. Internal consistency was analysed using Cronbach's α. Descriptive analyses included mean, median and standard deviation (SD). For all analyzed continuous variables, Shapiro-Wilk test was conducted to test the assumption of normality. Results of the PCS, LCQ, NGSE and the age of study participants were correlated with autonomous motivation in MS and the FMC. Pearson's correlation was used if the assumptions for parametric tests were met, Spearman's correlation was used for non-parametric variables. Independent Samples T-Test, or for non-parametric variables Mann-Whitney U-Test, were used to correlate autonomous motivation with dichotomous categorial variables like gender, children or intended specialty training (analyzed as Family Medicine vs. something else). Learning style as a categorial variable was correlated with autonomous motiva-

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tion using Kruskal Wallis test. For the analyses of motivational setup in MS compared to the FMC, a Paired Samples T-Test or for non-parametric variables Wilcoxon-Rank test was used. The paired Samples T-Test only included study participants that filled in both questionnaires, Q1 and Q2 (N = 55). In all analyses, the threshold for significance was $p \leq 0.05$.

## Results

Power analysis showed that a sample size of N = 44 is needed to significantly compare students' motivation in MS with students' motivation in the FMC by using a Paired Samples T-Test. The data showed high levels of internal consistency ratings (Cronbach's α) with all values well above 0.75. N = 92 medical students were enrolled in the FMC, N = 86 students (93.5 %) answered Q1. 39.5 % were male and 60.5 % were female. Their mean age was 26.2 ± SD 4.54 years. 14.1 % (N = 12) named Family Medicine as their first choice of specialization in Q1. N=55 students completed Q2 (59.8 %).

## Motivation in medical school and the Family Medicine curriculum

Perceived competence for learning and perceived self-efficacy correlated with higher levels of autonomous motivation to study medicine in general (rho = 0.476; p < 0.001, rho = 0.553; p < 0.001). No sociodemographic factor significantly correlated with autonomous motivation in MS in year five.

Autonomous motivation to study within the FMC correlated with perceived competence for learning and perceived autonomy (rho = 0.695; p < 0.001, rho = 0.628, p < 0.001). Sociodemographic factors did not correlate significantly with autonomous motivation in the FMC. Descriptively, students who named Family Medicine as their first choice of specialization showed higher mean levels of autonomous motivation within the FMC compared to students who want to specialize in something else (21.2 ± 2.89 vs. 19.43 ± 4.65). There was no significant statistical difference (U = 175; p = 0.316).

## Comparison of motivational setup between medical school in general and the Family Medicine curriculum

The overall motivational setup differed between MS in general and the FMC (table 2). Higher scores of autonomous motivation (W = 922; p = 0.015) and controlled motivation (t = 2.80; p = 0.007) and lower scores of amotivation (W = 247; p = 0.011) were found for MS compared to the motivational setup in the FMC.

## Discussion

## Perceived competence and motivational set up of medical students

Within this study cohort, sociodemographic background could not explain differences in motivation within the FMC. Correlation coefficients of the results reveal that especially perceived competence and autonomous motivation correlate in the FMC.

Autonomous motivation was significantly higher in MS compared to the FMC. Amotivation scores were significantly higher in the FMC compared to MS.

## Scales and correlations in the context of literature

Another evaluation method of the AMS is the summation of the respective subscales, as done by Sobral (2004) [16]. Averaging the arithmetic mean to comparable scale levels, leads to visually more comparable scores (uniform range: 4–28) within the categories: autonomous motivation, controlled motivation and amotivation. Using equal scale levels did not affect correlation results or statistical significance.

In a review, Orsini et al. (2016) describe correlations of autonomous motivation with sociodemographic factors such as age, gender and personality traits in health professions education [6]. This study could not find significant correlations between autonomous motivation and sociodemographic factors. This may be due to the fact that Family Medicine conveys medical competencies that are relevant for several different medical professions.

According to SDT, perceived competence is a major determinant for autonomous motivation [11]. When applied to curriculum design, Family Medicine curricula may foster autonomous motivation when focusing on competency-based education. For Family Medicine departments, this might be a helpful advice during the coming curriculum redesign process suggested by the NKLM.

| | N | Mean | Median | SD | Shapiro-Wilk | Paired Samples T-Test/ Wilcoxon rank |
|---|---|---|---|---|---|---|
| Autonomous Motivation(MS) | 54 | 21.40 | 21.50 | 3.22 | p<0.001 | W=922; p=0.015 |
| Autonomous Motivation (FMC) | 54 | 19.75 | 20.25 | 4.41 | | |
| Controlled Motivation(MS) | 54 | 15.06 | 15.00 | 5.27 | p=0.963 | t=2.80; p=0.007 |
| Controlled Motivation (FMC) | 54 | 13.15 | 13.50 | 4.18 | | |
| Amotivation (MS) | 55 | 6.53 | 4.00 | 4.05 | p=0.022 | W=247; p=0.011 |
| Amotivation (FMC) | 55 | 8.44 | 8.00 | 4.28 | | |

N = Number, SD = Standard deviation.

**Table 2** Motivational set up in medical school in general (MS) and the Family Medicine Curriculum (FMC).

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Kusurkar et al. (2011) stated that the choice of a specialty within medicine is also influenced by motivation [10]. Future studies need to investigate whether increasing motivation of students might be an additional approach from Family Medicine departments to secure future Family physician supply in Germany.

Kollewe et al. (2018) suggest a distinction between students' motivation to study medicine in general and the motivation to learn in MS [1]. The differences in students' motivational setup have not been investigated for a FMC before. Family Medicine departments need to be aware that they may be confronted with more amotivated study behavior than they may wish for, when being asked to take over more compulsory curriculum parts.

## Limitations

Data of motivation in MS and motivation within the FMC must be looked at in the view of the current worldwide pandemic, with restrictions affecting university teaching, academic conditions and probably motivation of students. Lower response rates of Q2 may have led to an attrition bias since especially amotivated students within the FMC might not have participated in Q2. The tools used in the questionnaires were validated in English. During translation the items were adapted to the study settings. Internal consistency results were comparable to the original English versions. We note that the presented correlations are not to be understood as proven causalities. Motivational results refer to the FMC at UdS and do not generally refer to Family Medicine as a discipline.

## Conclusions

This study shows that motivation of medical students in a FMC differs from motivation in MS in general at a German MS. Different motivational setups can be found within students, indicating that motivation is an alterable construct. Further studies may need to clarify whether differences in students' motivational set up mainly result out of students' interest in Family Medicine as a subject or the curriculum design. Perceived competence appears to play an important role for fostering motivation in a FMC. With the suggested increase in teaching responsibility for Family Medicine in the coming years, larger studies over different semesters may be needed to ensure a sound transitioning process to a competency-based FMC.

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