

Health-related profiles of study delay in university students in the Netherlands

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Abstract: Compared with their working peers, students report more health complaints. A worse self-rated health status could hinder students to function optimally within the high demands of studying at university. On the other hand, it can be expected that worse academic functioning may have a negative influence on existing health problems or even initiate health problems. The aim of this study was to investigate associations between indicators of health and study delay in university students in the Netherlands. A group of 5,859 students was invited to complete a questionnaire, consisting of questions about general health, fatigue, psychological health, support, study-related issues, study-related problem solving, time pressure, perceived study delay and program study delay. Three study delay profiles were calculated—program delay without perceived delay (A), perceived delay without program delay (B), and perceived and program delay (C) with no study delay as reference. The response rate was 51%. Profile A was associated with unfavorable outcomes in support, study-related issues, and study-related problem solving. Profiles B and C presented unfavorable outcomes in all dimensions. Perceived study delay appeared to be a more important determinant of unfavorable outcomes than program delay. The group with perceived delay without program delay closely resembled the group with perceived and program delay. This group may be at risk for future program-study delay.

Keywords: students, student health services, academic performance, health status, the Netherlands

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INTRODUCTION

From a demographic point of view, university students are expected to be a relatively healthy subset of the general population. Not only their young age but also their high level of education is associated with a better health status. However, previous studies have pointed to the opposite direction. Compared with their working peers, university students reported—in field studies—more health

complaints, a lower quality of life, and a worse health status than their peers (1-3).

A lower quality of life and self-rated health might hinder students from functioning optimally within the high demands of studying at university. On the other hand, it can be expected that poor academic functioning could have a negative influence on existing health problems or even initiate health problems. This bidirectional relation could force

students with health complaints into a vicious circle in which the students are at risk for dropping out, independent of their academic abilities.

Detecting students at risk for dropping out in an early stage is of great value. Early detection is possible only when the determinants of this health-related drop out are known. Several studies have been conducted on the associations between health indicators and academic functioning. Such studies, however, have focused on students following a particular course only (4-9) or only on psychological indicators of health (4,10). Few studies have investigated the associations between study delay and a broad range of physical and psychological indicators of health (5,11). Yet, most researchers have operationalized academic performance as obtaining a degree. When the aim is to detect students at an early stage, study delay is a more interesting variable. Another interesting question is how the students perceive this study delay. We hypothesize that associations between indicators of health and academic performance will be more prevalent in students who perceive a study delay.

The aim of this study was to investigate the associations between indicators of health and different types of study delay, program study delay, and perceived study delay, in university students in Amsterdam, the Netherlands.

METHODS

All students who were enrolled full-time in Medicine ($n = 1,548$), Psychology ($n = 2,381$), Economics ($n = 1,489$) or Occupational Therapy ($n = 441$) at the University of Amsterdam (the Netherlands) were invited by the managers of their courses to complete an anonymous internet-based questionnaire in the second month of the academic year (October 2005). The invi-

tation to complete the questionnaire, including the address of the website, was sent to each student by regular mail and by e-mail. Two weeks after the first invitation, all students received a reminder by e-mail. The website was open for two consecutive months. The Central Committee on Research involving Human Subjects from the Netherlands declared that this study was exempt from ethical review.

Questionnaire

The questionnaire consisted of 58 items, including questions about health status, problem solving, support, time pressure, study-related problems, study delay, and personal characteristics. Some questions were adopted from existing questionnaires, whereas others were formulated by a team of experts following a detailed literature review and interviews with students and significant others.

The questionnaire consisted of the following concepts: Health status was investigated by four items on general perceived health. Two single-item questions about general health status were adopted from the SF-36 questionnaire (general health (range: 1-5) and change in health status (range: 1-5)) (12). In addition, one item about being happy in one's own skin was added (yes/no) and one item about being healthy usually (yes/no).

Fatigue was investigated using the Short Fatigue Questionnaire (SFQ). The SFQ consists of four questions, each with a range of 1 to 7, with a higher score indicating more fatigue. A total score of more than 23 (range: 4-28, Cronbach's $\alpha = 0,84$) implies extreme fatigue for a student population (13). Psychological problems were investigated using three dichotomous items directed at cognitions and emotions (sadness, belief to be able to solve psychological problems, thinking about being

Table 1: Four groups of students according to study delay

		Do you have a study delay according to your own opinion?	
		No	Yes
Do you have a study delay according to the program of your study?	No	Group 1	Group 3
	Yes	Group 2	Group 4

dead). Support was measured by contacts with professional caregivers and the wish for more social support from family and friends.

Study-related issues were investigated with three items, including one item about satisfaction on study choice (yes/no), one item about satisfaction on the study circumstances in general (yes/no), and one item on the relationship between health complaints and studying (1-5). Study-related problem solving was investigated by four items adopted from the Social Problem Solving Inventory (14). To each item, the words 'regarding your study' were added to retrieve information on study-related problem solving. One item was excluded after a reliability analysis. The remaining three items were summed and divided by the number of items to obtain a total score for problem solving (Cronbach's $\alpha = 0.74$) (range: 1-5). In addition, confidence to obtain sufficient study marks (%), belief to have performance in own hands (yes/ no), and ability to cope well with the study (yes/no) were added. Time pressure was investigated with three items, one item about the perception of time pressure in general (yes/no), one item about time pressure related to the study (yes/no), and one item about experiencing difficulties to relax (1-5). The personal characteristics that were investigated were sex, age, and living situation.

Study delay was investigated using two items. One item focused on self-reported study delay according to the study program:

program study delay ('Do you have a study delay according to the program of your study?' yes/no). The second item focused on self-reported study delay according to the student's own perception: perceived study delay ('Do you have a study delay according to your own perception?').

Analysis

All participants were divided into the four groups presented in Table 1. The above-mentioned dimensions were compared between the four groups using one-way ANOVA and Chi-square comparisons and Bonferroni post hoc tests, with group 1 (no study delay) as reference group.

Next, logistic regression analyses were conducted to create three profiles for study delay for groups 2, 3, and 4, with group 1 as reference group. First, a backward logistic regression analysis was performed within each of the above-mentioned concepts. Next, the remaining variables of each concept were put together into one final logistic regression model using the Enter method. Nagelkerke R^2 was used as a measure for the percentage of explained variance (15). The level of statistical significance was set at $p < .05$. Statistical analyses were performed using SPSS for windows (version 12.0).

RESULTS

Of 5,859 students, 3,007 completed the questionnaire, a response rate of 51%.

Table 2: Study population characteristics

		Mean	SD
Age		21.92	4.23
		n	Percent
Sex	Male	938	31
	Female	2069	69
Living situation	Alone or with peers	1746	58
	With family	1261	42
Study course	Psychology (response: 55%)	1298	43
	Economics (response: 38%)	578	19
	Medicine (response: 56%)	859	29
	Occupational therapy (response: 62%)	272	9
Study delay	1. Not according to program, not by own perception	995	33
	2. According to program, not by own perception	435	15
	3. Not according to program, but by own perception	225	8
	4. According to program and own perception	1352	45

Occupational therapy showed the highest response (62%) and Economics the lowest response (38%). More female (69%) than male students completed the questionnaire. Two-thirds of the study population (67%) reported some kind of study delay. More students reported program study delay ($n = 1,787$) than perceived study delay ($n = 1,577$) (see table 2).

Bivariate results

The results of the bivariate analyses are presented in table 3. One in every ten students considered himself unhealthy, and 15% reported to be not happy in their own skin. The level of fatigue among the students was high, with 9% reporting extreme fatigue. One-fifth reported being too sad too often. In addition, they would like to have more support from friends and family. Almost 80% of the students reported not having professional help at

the moment. Half the students reported having too little time to study, with more than one third having too little time for themselves.

Program study delay was associated with wishing for more support from family and friends, less satisfaction about study choice, more unfavorable study circumstances, worse study-related problem solving, and too little time for oneself more often. Perceived study delay, with or without program study delay, was associated with lower general health, more fatigue, wish for more support, more negative study-related issues, worse study-related problem solving and more time pressure.

Multivariate models

The concept study-related problem solving explained most of the variance in all three groups (see table 4). Support and study-related problem solving were

associated

Table 3: Bivariate associations between health indicators and study delay types

Health indicators	Study delay				TOTAL
	None	Program + Perceived –	Program– Perceived+	Program+ Perceived+	
	Group 1	Group 2	Group 3	Group 4	
General Health	n=1352	n=435	n=225	n=995	
General health (1:bad – 5:good)	4.03 (.71)	4.04 (.66)	3.88 (.71)*	3.84 (.76)*	3.96 (.72)
Happy in own skin (% no)	13.39	11.49	17.78	20.70	15.86
Usually healthy (% no)	7.99	5.98	18.22*	13.27*	10.21
Change in health (% yes)	34.47	37.93	44.44*	44.32*	38.98
Fatigue					
Fatigue (4 little –28 high)	14.33 (6.04)	14.40 (5.98)	16.39 (5.48)*	16.00 (6.21)*	15.05 (6.10)
Extreme fatigue (score >23) (%)	7.47	7.36	11.56	12.56	9.44
Psychological health					
Too often too sad (% yes)	18.27	17.01	25.33*	25.73*	21.08
Belief to solve psychological problems (no)	4.22	4.60	8.00*	9.75*	6.39
Thinking: 'I'd rather be dead'	13.55	14.71	20.44*	20.50*	16.53
Support					
Wish for social support (% yes)	13.83	18.39*	24.44*	29.35*	20.42
Professional help at the moment (% no)	82.69	83.91	81.33	76.88	80.84
Study-related issues					
Satisfied about choice of study (% no)	4.07	6.44*	8.00*	9.65*	6.55
Unfavorable circumstances (% yes)	13.98	21.61*	29.33*	28.64*	21.08
Health complaints resulting from study (1=no – 5= >75%)	1.67 (.86)	1.72 (.88)	1.88 (.86)*	1.91 (.93)*	1.77 (.89)
Study-related problem solving					
Adequate problem solving (1-5)	4.17 (.59)	4.08 (.64)*	3.93 (.69)*	3.79 (.69)*	4.01 (.66)
Confidence to obtain sufficient study marks (0-100%)	86.95 (14.36)	88.81 (12.96)*	78.51 (18.16)*	77.72 (37.38)*	83.60 (24.93)
Performance in own hands (% no)	5.77	5.98	12.44	13.17*	8.75
Able to cope with the study (% no)	5.18	9.43*	22.67*	21.81*	12.60
Time pressure					
Difficult to relax (1:no – 5: yes)	2.05 (.98)	2.06 (.96)	2.25 (.96)*	2.11 (.99)*	2.09 (.98)
Little time to study (% yes)	43.79	48.28	61.33*	61.11*	51.48
Little time for oneself (% yes)	39.50	44.14*	48.00*	37.49*	40.14

* p<0.05 from group 1

Table 4: Percentage of explained variance of each concept for each of the study delay types

Explained variance (%)*	Study delay		
	Program + Perceived –	Program – Perceived +	Program + Perceived +
Concepts			
General Health	-	4.5	14.2
Fatigue	-	5.0	14.2
Psychological health	-	3.0	13.7
Support	10.4	3.5	16.4
Study related issues	10.6	5.6	16.7
Study-related problem solving	13.3	11.4	28.6
Time pressure	-	5.0	16.3

* All analyses are corrected for type of course and living situation

associated with all types of study delay. The health dimensions contributed to the explained variance in groups with perceived study delay (groups 3 and 4) only.

The results of the multivariate models are presented in table 5. Unfavorable study circumstances, inadequate problem solving capacities, a higher confidence to obtain sufficient study marks, and the inability to cope with the study were associated with program study delay (group 2). Perceived study delay without program delay (group 3) was associated with a lower confidence to obtain sufficient study marks by the end of the year, being less able to cope well with the study, and too little time to study more often. Perceived study delay in combination with program study delay (group 4) was associated with wishing more support from family and friends, not having professional help, less satisfaction with study choice, lower confidence to obtain sufficient study marks, less belief that performance was within own hands, less able to cope well with the study, too little time to study more often, and more personal time.

DISCUSSION

The main finding of this study was that study delay in university students in Amsterdam is associated with unfavorable outcomes in the concepts support, study-related issues, and study-related problem solving. In addition, perceived study delay was associated with lower general health status, more fatigue, worse psychological health, and more time pressure, as well. Students with perceived study delay but without program study delay resembled the group reporting perceived and program study delay, which might put them at risk for program study delay in the future.

Profile 1: Program study delay without perceived study delay

Students reporting study delay according to the program, but not having a study delay according to their own opinion, differ from the group without any study delay in concepts support, study-related issues, and study-related problem solving. Because these students do not think they have a study delay, their study delay may be only minor. This

subscribes to our finding that this group

Table 5: Multivariate models for all three types of study delay

Study delay:	Program +		Program –		Program +	
	Perceived –		Perceived +		Perceived +	
	OR	95% CI	OR	95% CI	OR	95% CI
	lower	upper	lower	upper	lower	upper
General Health						
General health (1:good – 5: bad)					.94	.79 1.11
Change in health (yes)			1.28	.92 1.78	1.14	.92 1.42
Happy in own skin (no)					.73	.53 1.01
Usually healthy (no)			1.39	.86 2.26		
Fatigue						
Fatigue (more)			1.01	.97 1.04	1.00	.98 1.02
Psychological health						
Belief to solve psychological problems (no)					1.10	.69 1.76
Too often too sad (% yes)						
Thinking: “I’d rather be dead”			1.06	0.69 1.65	0.91	0.68 1.23
Support						
Wish for more support (yes)	1.25	.89 1.75	1.20	.79 1.81	1.85	1.42 2.42
Receiving professional help (no)					1.36	1.08 1.71
Study-related issues						
Satisfied about choice of study (no)					1.58	1.03 2.41
Unfavorable circumstances (yes)	1.40	1.02 1.94	1.33	.88 2.00	1.23	.94 1.61
Health complaints resulting from study (1=no – 5= >75%)			1.13	.93 1.37	1.08	.94 1.23
Study-related problem solving						
Problem solving (adequate)	.70	.57 .85	.77	.59 1.01	.48	.40 .57
Confidence to obtain sufficient study marks (higher)	1.02	1.01 1.03	.98	.97 .99	.99	.98 1.00
Performance in own hands (no)					1.79	1.25 2.57
Able to cope well with the study (no)	1.80	1.10 2.93	2.46	1.51 4.02	2.63	1.81 3.83
Time pressure						
Little time to study (yes)			1.56	1.11 2.20	1.73	1.38 2.15
Little time for oneself (yes)					.53	.41 .67
	R2: 13.9%		R2: 14.2%		R2: 32.9%	

OR> 1: variable associated with study delay; OR<1: associated with no study delay (reference group);

* All analyses are corrected for type of course and living situation

has more confidence to obtain sufficient study marks by the end of the academic year compared to the group without study delay. This group appears not to be worried about their study, and their perceived health is comparable with the group without study delay.

Another possibility is that these students subscribe their study delay to external factors they cannot control themselves. When they cannot control the factors that cause their program delay, they will not worry about their own performance. The unfavorable study circumstances reported by this group support this idea. This may increase the risk for additional study delay. If students use unfavorable study circumstances as an excuse for their program study delay, then they will most likely not be motivated to increase their study efforts to recover from their program delay. These students admit that they are unable to cope well with study, have inadequate problem solving capacities, but do not appear to be affected by this. These students probably have an external study locus of control. The fact that they wish more social support may therefore rather point in the direction that they hope that others may solve their problems than that they are suffering from their own inabilities. Insight into one's performance is needed to catch up with program delay, or, even more important, to avoid an increase in program study delay.

Profile 2: Perceived study delay without program study delay

Students reporting perceived study delay without program study delay form an interesting group. We hypothesized in advance that a group of students would report program delay without perceived delay, but we had not expected that students would report perceived study delay without program delay. The profile of this group

shows that this group is obviously worried about their performance, although they do not (yet) have program study delay. From table 5, we can conclude that these students closely resemble those who report perceived as well as program study delay. One could expect that worse health status alone, apart from the presence or absence of perceived study delay, may interfere with their performance, eventually leading to program study delay in the future. We therefore hypothesize that this group represents an early stage of the group with perceived and program study delay. Action is needed to prevent students from a transition from group 3 toward group 4.

A direct comparison between group 3 and group 4 pointed out that group 3 appeared to have better problem solving capacities, but a higher percentage reported not to be healthy usually. In addition, the students with perceived study delay more often reported having too little time for themselves. Possibly, their better problem-solving capacities and spending more time on their studies may have prevented them from program study delay until now. This group is most likely balancing at the border between the presence and absence of program delay. These students will have to work hard to prevent program delay, and may therefore have the feeling that they are not doing enough. This group of students may be at risk for study delay as well. We cannot confirm any of the hypotheses mentioned above with the present dataset, but in any case, the group with perceived study delay without program delay deserves more attention.

Profile 3: Program and perceived study delay

Students with program delay, as well as perceived study delay, report the most unfavorable outcomes from all groups in all

dimensions. Significantly more students were not involved with professional help when completing the questionnaire. This response is surprising because this group fully admits to having a problem regarding their performance—they reported having a study delay according to their own opinion. In addition, they suffer from problems with their general and psychological health. Apparently, suffering from problems does not directly lead to seeking professional help. This finding is in agreement with previous studies showing that students do have health problems, when asked in an open population study (2;3), but they do not present these problems at the student health service (16).

Associations between academic performance and worse health outcomes have been reported before, as well. Several groups have found associations between a worse health status and a negative perception of the study situation (3) or worse study outcomes (17-19).

Surprisingly, fewer students in the group without any study delay reported to have too little time for themselves. This finding may be an illustration of the low problem-solving capacities in the group with study delay. These students may not relate spending time in their studies to better performance. Another explanation may be that this group, with worse health status, considers their health problems as more important. They may rank time for themselves as more important than their performance at university.

Methodological considerations

The 51% response to the questionnaire implies that the present results should be interpreted with care. Due to the subject of research, one might expect that students with health complaints or study problems would be more eager to complete the

questionnaire than would students without problems. The present findings on the prevalence of study and health problems may therefore be an overestimation of the true effects. The observation that significantly more female than male students completed the questionnaire is in agreement with the male/female distribution within the participating study courses. Another important remark is our investigation of study delay. All information was based on self-reported information about study delay. This approach was chosen to ensure the anonymity of the participants. That perceived study delay appeared to be the most important outcome measure subscribes to our choice to collect self-reported information rather than administrative information on this topic.

The information presented here will become more valuable when the questionnaire is repeated at other times. Longitudinal designs will reveal information about causes and consequences that cannot be distinguished in cross sectional survey studies. When interpreting the results, one should keep in mind that university systems vary across different countries. Such variations will have an influence on study delay, and therefore on study delay profiles.

Implications for science and practice

The results of the present study cry for action. A relatively high proportion of students reported unfavorable outcomes on several health- and study-related dimensions, although only a minority reported having professional help. Not having professional help was associated with reporting perceived and program study delay. Although we could not distinguish cause and consequence, obviously the group who needs help the most does not report having help. Why don't students seek help when they need it? Investigating the

background of this phenomenon deserves more attention from scientists, as well as from policy-makers and healthcare workers. Most universities offer many different forms of help, but just offering is not enough. More effort is needed to persuade the student to step into the student health worker's office, or the office of any other professional who is able to help the student.

In addition, perceived study delay was particularly associated with worse outcomes, more than program study delay was. The group with perceived study delay, but without program delay, should be monitored with extra care. Although this group does not have program study delay at present, such students may be at risk for program study delay in the future. Would it not be a pity if students having the capacity to complete a university study were to leave university without a degree due to health-related problems? This type of avoidable study withdrawal should be prevented, for the sake of the students' well being, as well as for the universities, which will always keep on trying to avoid low graduation rates. Health surveillance programs aiming to detect students with health problems, who may be at risk for study delay, would therefore be of great value in preventing unnecessary study delay and suffering by students.

When investigating study delay in the future, perceived study delay should be integrated into the analyses as well. The present results show that the largest contrasts within the group without any study delay can be found in students with perceived study delay. When investigating program study delay, including a group with perceived study delay, which is divided into groups with and without program study delay, would drastically diminish such contrasts, leaving important information undiscovered.

From the present results, we can conclude that study delay is associated with an unfavorable outcome in several dimensions regarding study problems and health issues. Perceived study delay is associated with worse health status and psychological health. Students with perceived study delay, but without program study delay deserve extra attention because they may be at risk for developing program delay in the future. Researchers, policymakers, universities, and healthcare professionals should think about ways to decrease the threshold for students to seek help.

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