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Youths with chronic conditions and risky behaviors: an indirect path

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Youths with chronic conditions and risky behaviors: an indirect path

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ABSTRACT

Objective. To compare risk behaviors between youths living with a chronic condition (CC) and their healthy peers, controlling for condition severity.

Methods. Data were drawn from the baseline wave of the GenerationFRee study (students aged 15 to 24 years in post-mandatory education) during the 2014-2015 school year. The sample (N=5179) was divided into youths with CC without limitations (N=536; 10.4%), youths with limitations (N=114; 2.2%), and a control group (CG; N= 4'529; 87.4 %). Groups were compared on internalizing factors (perceived health status, vision of their future, emotional wellbeing) and externalizing behaviors (substance use, gambling, excessive internet use, disordered eating, violent and antisocial acts) controlling for potential confounders. Statistical analyses were carried out through a structural equational modeling (SEM). Results are given as unstandardized coefficients.

Results. Overall, CC youths showed an association with internalizing factors (coefficient: 0.78) but not with externalizing behaviors. In fact, the connection with externalizing behaviors was indirect via the internalizing factors (0.32). CC Youths reporting psychological issues were more likely to adopt every externalizing behavior.

Analyzing separately youths with CC limiting daily life activities and those without limitations, the results did not change substantially. However, the association with internalizing factors was much higher for those reporting limitations (2.18 vs. 0.42).

Conclusions. Our results show that the link between suffering from a CC and adopting risk behaviors is indirect through internalizing factors. Health professionals should address emotional wellbeing and perception of the future rather than focus exclusively on the effects of risk behaviors on specific diseases.

Key words: chronic condition, youths, risk behaviors, psychological adjustment

INTRODUCTION

Approximately 10% of adolescents live with a chronic illness or disability that could limit their daily activities(1, 2). In the past chronic conditions were considered to be protective against risky behaviors(3), but lately several studies have proved the contrary(4, 5). Nowadays, studies point out that adolescents living with a chronic condition may engage in risky behaviors to the same or even to a higher extent than their healthy peers(3-5). Risk behaviors such as substance use, violent or antisocial acts are all defined as externalizing problems and can potentially impact negatively both with their chronic condition and its treatment(6, 7).

Internalizing problems among youths with chronic conditions include somatic complaints, anxiety, depression and social withdrawal(8), but results reported in the literature are conflicting. Some studies indicate no difference between healthy and ill adolescents(9), while others have shown more psychosocial problems associated with chronic illness, such as anxiety(10), negative view of their future(5) , lower emotional wellbeing(11) or depression(12).

Additionally, some studies have concluded that both internalizing and externalizing problems depended on the condition(8, 13, 14) or on the severity of the condition, i.e. the impact of the illness on daily activities(15, 16).

Theoretical framework

The basis of our theoretical model was that living with a chronic condition is linked both to externalizing and internalizing factors. As mentioned above, there is evidence in the literature that youths with chronic conditions are as or even more likely to engage in risk behaviors than their healthy peers(3-5). In the same line, there is evidence that youths with chronic conditions are more likely to suffer from internalizing factors such as depression and lower emotional wellbeing(11, 12). Moreover, depressive symptoms during adolescence are also

associated with health risk behaviors(17). Around this central point there are additional factors that can influence externalizing and/or internalizing factors that need to be controlled for such as gender, age, perceived pubertal timing, socioeconomic status (SES), family structure and academic track. Gender plays a double role: males are more likely to report externalizing behaviors(5, 18) while females are more likely to report internalizing issues(15, 18, 19). Age is associated to presenting both with internalizing and externalizing factors(20). Moreover, research has shown that chronic conditions can have an effect on advancing or delaying puberty(21, 22) and that advanced puberty is a risk factor for externalizing behaviors, such as higher rates of substance use and abuse(20). SES can also play a role as it has been observed that youths with chronic conditions and lower SES report poorer emotional wellbeing(23), while both lower(24) and higher(25) SES predict risk for substance abuse, highlighting that risks are present at both ends of the economic spectrum. Non-intact families have also been linked to risky behaviors in adolescence(26). Finally, academic track can also play a role, with youths in vocational school (apprentices) being more likely to engage in risk behaviors than those in high school(27, 28).

Using a non-categorical approach(29), the aim of our study was to compare youths living with a chronic condition and their healthy peers in their association with internalizing and externalizing factors, controlling for the severity of the condition represented by the limitations in daily life activities. We hypothesized that (1) youths with chronic conditions would present similar or even higher rates of externalizing and internalizing factors than their healthy peers, and that (2) these associations would depend on the severity of the disease. Thus, youths with limiting chronic conditions would differ both from those without limitations and those without chronic conditions by reporting more internalizing issues but less externalizing behaviors because of their poorer health status.

METHOD

Data were drawn from the baseline wave of the GenerationFRee study (www.generationfree.ch) during the 2014-2015 school year. The survey included students aged 15 to 24 years from the eleven post-mandatory schools (six vocational and five high-schools) of the canton of Fribourg. In Switzerland, after mandatory education (age 15), about one third of youths follow high school and two thirds vocational school (apprentices enrolled in companies for professional training with classes 1 or 2 days per week). All students were invited to participate in a web-based self-administered anonymous questionnaire (completed in the schools' computer science room) that aimed to assess their lifestyle. A total of 5'834 questionnaires were filled online. Of those, 5'179 (89%) were valid and 655 (11%) were eliminated because they were not properly completed (n=244), subjects did not want to participate (n=200) or were not in the target age group (n=211). The Ethics Committee of the canton of Vaud approved the study protocol.

Following Denny et al.(16) who supported the fact that the severity of the condition has a negative impact on internalizing and externalizing problems, and to test our hypotheses, we divided the sample into three groups based on the answers to the question "Do you have a chronic condition (disease or disability which lasts for more than a year and needs regular care, e.g. asthma, diabetes, scoliosis) and if yes, does it limit your daily life activities ?". The group without limitations ("Yes I have a chronic condition but it does not limit my daily activities") included 536 subjects (10.4%) while the one with limitations ("Yes I have a chronic condition and it limits my daily activities") included 114 (2.2%). Finally, the control group comprised 4'529 youths (87.4 %) who answered negatively to the question. The distribution of the conditions according to the 10^{th} version of the International Classification of Diseases (ICD-10) can be found in Table 1. As some disease groups included small

numbers of participants, we decided to use a non-categorical approach as described by Stein and Jessop(30) and supported by Perrin et al.(29).

Internalizing factors

We used three variables: perceived health status, emotional wellbeing and vision of their future. Perceived health status had five possible answers dichotomized into good (excellent, very good, good) and poor (fair, poor) health. For emotional wellbeing we used the WHO-5 index(31). This index includes 5 items referred to the last two weeks (e.g., "I have felt active and vigorous") scored from 0 (at no time) to 5 (all of the time) for a total score ranging from 0 to 25, with a score under 13 being considered as poor emotional wellbeing. To measure vision of their future, we used the Bern subjective wellbeing questionnaire for adolescents(32) that includes 6 items (e.g., "I am happy with my life") scored from 1 (completely untrue) to 6 (absolutely true) for a total score ranging from 6 to 36. Higher scores indicate a better vision of the future.

Externalizing behaviors

We included 9 externalizing behaviors. Substance use included current tobacco smoking (yes/no), alcohol misuse (at least one episode of drunkenness in the past 30 days), cannabis use and use of other illegal drugs (at least once in the past 30 days for both). We also analyzed violent (at least one of the following in the past 12 months: carrying a weapon, using a weapon in a fight, snatching with violence, attacking an adult) and antisocial (at least one of the following in the past 12 months: vandalism, stealing, setting fire to something, selling drugs including cannabis) acts. We used the short form of the Young's Internet Addiction Test (IAT)(33) to measure excessive internet use. The scale ranges from 0 to 60 points, with those reporting a score above 30 being considered at risk. We measured disordered eating trough the SCOFF questionnaire(34) that includes 5 dichotomous questions (e.g., "would you say food dominates your life?"). Two or more positive questions indicate risk of disordered

eating. Finally, we assessed gambling with the South Oaks Gambling Screen Revised for Adolescents (SOGS-RA)(35). It comprises 12 questions (e.g., "Have you ever gambled more than you had planned to?"), with a score of 2 or over being considered as at risk.

Confounding factors

We controlled for the potential confounding factors described in the theoretical model: age, gender, perceived onset of puberty (advanced, on time, delayed compared to their peers), academic track (student/apprentice), family structure (parents together/other) and perceived SES. To assess SES we used the question from the European School Survey Project on Alcohol and other Drugs (ESPAD)(24): "Compared to the financial situation of other families in Switzerland, would you say that your family is…" with 7 possible answers ranging from very below to very above average and trichotomized into above average, average and below average.

Statistical analysis

For the bivariate analysis, we used the Ch-square test for categorical variables and ANOVA for continuous ones. Subsequently we used the structural equation model (SEM) framework to operationalize our theoretical framework(36). We utilized two latent variables to represent the internalizing and externalizing factors, with three manifest (observed) variables associated to the internalizing factor and nine manifest variables associated to the externalizing factor. To allow the latent variables to be identifiable, the coefficient for one of the manifest variables had to be fixed to one for each latent variable (perceived health status for the internalizing factors and current tobacco smoking for the externalizing ones). We estimated three different SEM. In the first one, we compared all youths with a chronic condition to the healthy controls. In the two other models, only youths with a non-limiting chronic condition (model 2) or youths with a limiting chronic condition (model 3) were compared to their healthy peers. We ran these additional models to check whether the severity of the condition

had an impact on the results. Since our observed variables are mainly categorical, the SEM models were estimated using a maximum likelihood procedure. The main difference with standard SEM applied to continuous variables is that the traditional measures of fit such as the Root Mean Square Error of Approximation (RMSEA) or the Comparative Fit Index (CFI) are not available, so we had to rely mostly on the tests of the coefficient themselves (p-values) to judge the quality of each model. Results are given as unstandardized coefficients. We used Stata 14 (StataCorp, College Station, Texas) for all computations.

RESULTS

The bivariate analysis comparing the three groups can be found in table 2.

Model 1: Healthy vs. chronic conditions (Figure 1)

Internalizing variables

Overall, youths with chronic conditions were more likely to report internalizing factors (coefficient: .78). Using perceived health status' coefficient as the fixed reference, the coefficient between youth with chronic conditions and latent intrinsic variables showed that they were significantly more likely to report poor emotional wellbeing (-1.64) and a negative vision of their future (-2.04).

Externalizing variables

There was no direct association between suffering from a chronic condition and externalizing factors. In fact, there was an indirect connection via internalizing ones (.32). Thus, we could observe that youths with chronic conditions reporting psychological issues were more likely to adopt every externalizing behavior. All risk behaviors were significant.

Socio-demographic variables

Males reported more externalizing behaviors and less internalizing issues than females while age had a direct association with both groups of variables. Concerning SES, those above

average reported more risky behaviors and better wellbeing while those below average reported having more internalizing factors but no direct link with externalizing ones. Youths in non-intact families reported both more externalizing and internalizing factors.

We observed a larger proportion of youths with chronic conditions reporting advanced or delayed puberty. Moreover, advanced puberty was associated with both risky and internalizing behaviors, while delayed puberty only appeared to rise internalizing ones. Youths in apprenticeship were more likely to adopt risk behaviors than those in high school, independently of their health status.

Model 2: Healthy vs. non-limiting conditions (Figure 2)

When analyzing only youths with non-limiting chronic conditions the results were almost unchanged with three exceptions: the coefficient linking to internalizing factors was lower (.42), and the link with disordered eating was no longer significant, as well as the link between age and internalizing issues.

Model 3: Healthy vs. limiting conditions (Figure 3)

The results for youths with limiting chronic conditions were very similar to those for the complete sample, except that there was no association with delayed puberty and age had no influence. However, the coefficient linking limiting chronic conditions to internalizing factors was more robust (2.18), over 5 times the one found for non-limiting youths, indicating a poorer psychological wellbeing when the condition limits daily activities.

DISCUSSION

Our results confirm our first hypothesis showing an association between suffering from a chronic condition and engaging in risky behaviors. However, the association is indirect and transits through internalizing factors, suggesting that youths reporting psychological distress in addition to their chronic condition would be more prone to adopt risky behaviors. As

youths with chronic conditions reported poorer emotional wellbeing and a more negative vision of their future than healthy controls, the mediation through psychological distress would explain why, contrary to our second hypothesis, the association with externalizing behaviors remains stable independently of the limiting effect of the condition.

Living with a chronic condition might alter youths' perception about their future, making it compromised by the uncertain evolution of the illness and the possible appearance of limitations in daily life activities. Perception of future seems to be their number one concern, even to a higher degree than their emotional wellbeing.

Youths with depressive symptoms are more likely to get into risky behaviors, such as smoking, drinking and using illicit substances(37). In our case, it might be accentuated by the psychological repercussion of the chronic condition that makes youths more susceptible to peer influence in experimenting risk behaviors in order to feel as normal as their healthy peers(4). On the other hand, their uncertain/compromised future might play a major role in risk seeking. Research on the influence of future perception on risky behaviors is scarce, but Stoddard et al.(38) observed that higher levels of future orientation and hope were associated with less violent behaviors during adolescence. It could be hypothesized that youths with chronic conditions and a negative perception of their future might be less concerned about the consequences of risk taking behaviors as they might feel that they have nothing to lose.

Our analyses confirm previous research regarding the other analyzed variables. First, we noticed gender differences similar to other studies(5, 15): females reported more internalizing and less externalizing issues than males. Courtenay(18) proposed a possible explanation for gender differences, with females tending to show and report more depressive symptoms, while males tend more to act out and underreport their psychological problems as part of their growing masculinity. Our results confirm the association between suffering from a chronic condition and advanced or delayed puberty described in the literature(21, 22). However, only

advanced puberty is associated with externalizing behaviors. Deppen et al(39) also found that subjectively early maturing girls were more likely to engage in risk behaviors than their peers. In this sense, Patton et al.(20) reported that the difference was that early maturers have more time to adopt risky behaviors than those with delayed pubertal onset. Moreover, our analysis reported that offset pubertal timing is associated with higher internalizing issues, in concordance with previous research(40-42). We hypothesize that offset puberty might reinforce their feeling of being different from their healthy peers and thus affect their psychological wellbeing. In line with other studies(20, 43), we also observed an increase of both extrinsic and intrinsic factors with age. Additionally, our findings indicate that chronic conditions are not linked to school track but confirm that apprentices are more likely to adopt risk behaviors than youths in high-school(27, 28). As found in the literature, higher SES seems to be associated to increased risky behaviors(25, 44), while lower SES is associated to a less promising future. A longitudinal study observed that adolescents with low parental SES would have lower self-esteem and more distress symptoms, an effect that would continue into early adulthood(45). In line with Levin(26), we observed that youths in non-intact families adopt more risky behaviors, and that it influences psychological issues.

Our study strengthens and clarifies the link between chronic conditions and risk behaviors by adding the indirect path through internalizing factors with an innovative statistical approach (SEM) and using a large school-based sample. However, limitations need to be addressed. First, the study was cross-sectional allowing no definitive conclusion about causality. Second, the fact that data are self-reported opens to possible response or social desirability biases, although anonymous self-administered questionnaires are known to reduce this effect(46). Third, the number of youths with limiting chronic conditions was relatively low (n=114), restraining the statistical power of the study. Nevertheless, the prevalence of youths with chronic conditions in our sample (12.6%) is consistent with previous Swiss studies(2, 4).

Fourth, we used a non-categorical approach as most condition groups in the study included small numbers of participants. However, as almost half of the chronic conditions (46%; Table 1) were diseases of the respiratory system (mainly asthma), we ran a post-hoc analysis of the model excluding respiratory conditions to assess its influence and the results remained the same (data not shown). Finally, we did not have access to youths suffering from severe chronic conditions that impede them to attend school, or those who attend special schools. Therefore, our data only include those with milder health conditions who, nevertheless, represent the majority of these youths.

In conclusion, living with a chronic condition is not a protective factor against risky behaviors. Health professionals should screen and give counseling and prevention messages regarding health risk behaviors to these youths, as they would do with their healthy peers. Prevention screening for health risk behaviors takes time, and screening psychological issues is often neglected when the adolescent does not appear depressed(47). Nevertheless, exploring their psychological wellbeing could be a marker to identify youths at risk. Health professionals should avoid focusing only on the effects of risk behaviors on specific diseases, and address more generally wellbeing and perception of future. The literature indicates that envisioning a positive future is critical to foster resilience in at-risk youth and thus reduce risk behaviors(48). Therefore, our findings highlight the need for these youths, especially those with limiting conditions, to have a life plan including educational and vocational goals instead of reducing it to a plan centered on their condition.

Table 1: Distribution of the conditions (N=650) according to the International Classification of Diseases (ICD)-10 groups

ICD-10 Group	**N**	
I Certain infectious and parasitic diseases	9	1,4%
II Neoplasms	3	0,5%
III Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	21	3,2%
IV Endocrine, nutritional and metabolic diseases	35	5,4%
V Mental and behavioural disorders	26	4,0%
VI Diseases of the nervous system	20	3,1%
VIII Diseases of the ear and mastoid process	2	0,3%
IX Diseases of the circulatory system	14	2,2%
X Diseases of the respiratory system	299	46,0%
XI Diseases of the digestive system	29	4,5%
XII Diseases of the skin and subcutaneous tissue	22	3,4%
XIII Diseases of the musculoskeletal system and connective tissue	124	19,1%
XIV Diseases of the genitourinary system	7	1,1%
XVII Congenital malformations, deformations and chromosomal abnormalities	4	0,6%
XVIII Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	5	0,8%
Non-specified	30	4,6%

Table 2: Bivariate analysis comparing the three study groups

Variables		Control group (N=4529)	Chronic disease without limitation (N=536)	Chronic disease with limitation (N=114)	P
Gender (female)		46.16%	52.57%	58.92%	0.004
Age (mean±SD)		18.27±0.033	18.33±0.22	18.60±0.22	0.13
Academic track (student)		41.31%	40.42%	44.52%	0.77
Parents living together		69.67%	69.79%	57.39%	0.046
Socio-economic status	Above	39.91%	34.13%	35.10%	<0.001
	Average	52.79%	52.81%	43.53%	
	Below	9.30%	13.06%	21.37%	
Pubertal timing	Advanced	28.81%	35.64%	44.83%	<0.001
	On time	56.27%	45.90%	37.80%	
	Delayed	14.92%	18.46%	17.37%	
Internalizing factors					
Perceived health status (poor)		2.64%	10.52 %	43.08 %	<0.001
Emotional wellbeing (poor)		18.82%	27.31 %	49.64 %	<0.001
View of the future (mean±SD)		27.77±0.09	26.96±0.26	23.27±0.80	<0.001
Externalizing factors					
Current tobacco smoking		37.30%	38.19%	43.83%	0.43
Alcohol misuse (last 30 days)		41.80%	38.84%	44.21%	0.44
Cannabis use (last 30 days)		18.60%	23.00%	23.60%	0.08
Illegal drugs' use (last 30 days)		2.90%	2.58%	7.85%	0.02
Violent behavior (last 12 months)		10.66%	12.80%	22.78%	<0.001
Antisocial behavior (last 12 months)		18.51%	17.91%	23.81%	0.46
At risk for disordered eating		19.08%	24.34%	41.38%	<0.001
At risk/problematic gambling		4.89%	4.71%	7.14%	0.64
Excessive Internet use		8.84%	9.45%	20.12%	<0.001

Figure 1. Model 1: Healthy vs. chronic conditions (only coefficients significant at the 95% level are given).

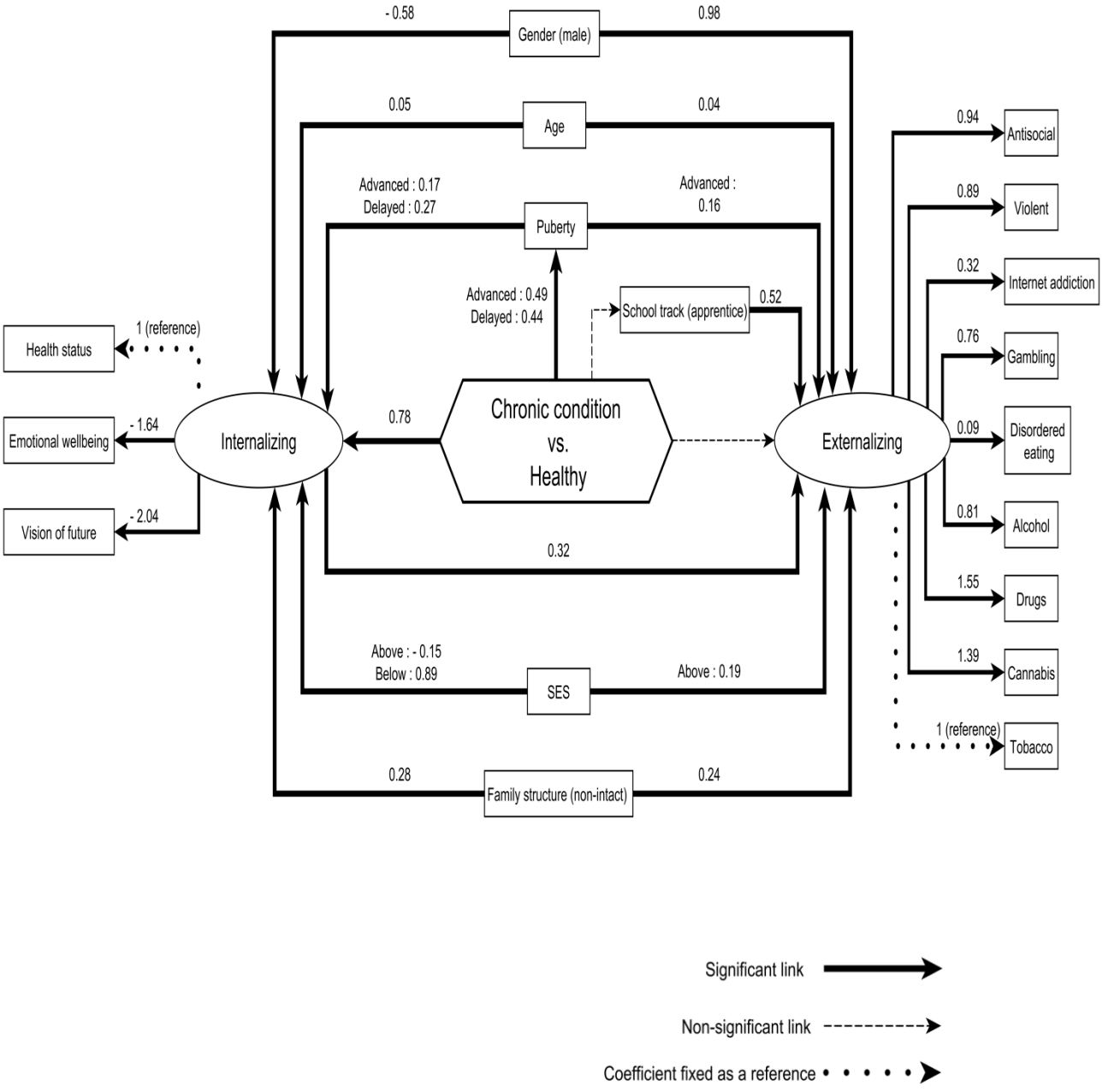


Figure 2. Model 2: Severity of chronic conditions: healthy vs. non-limiting conditions (only coefficients significant at the 95% level are given)

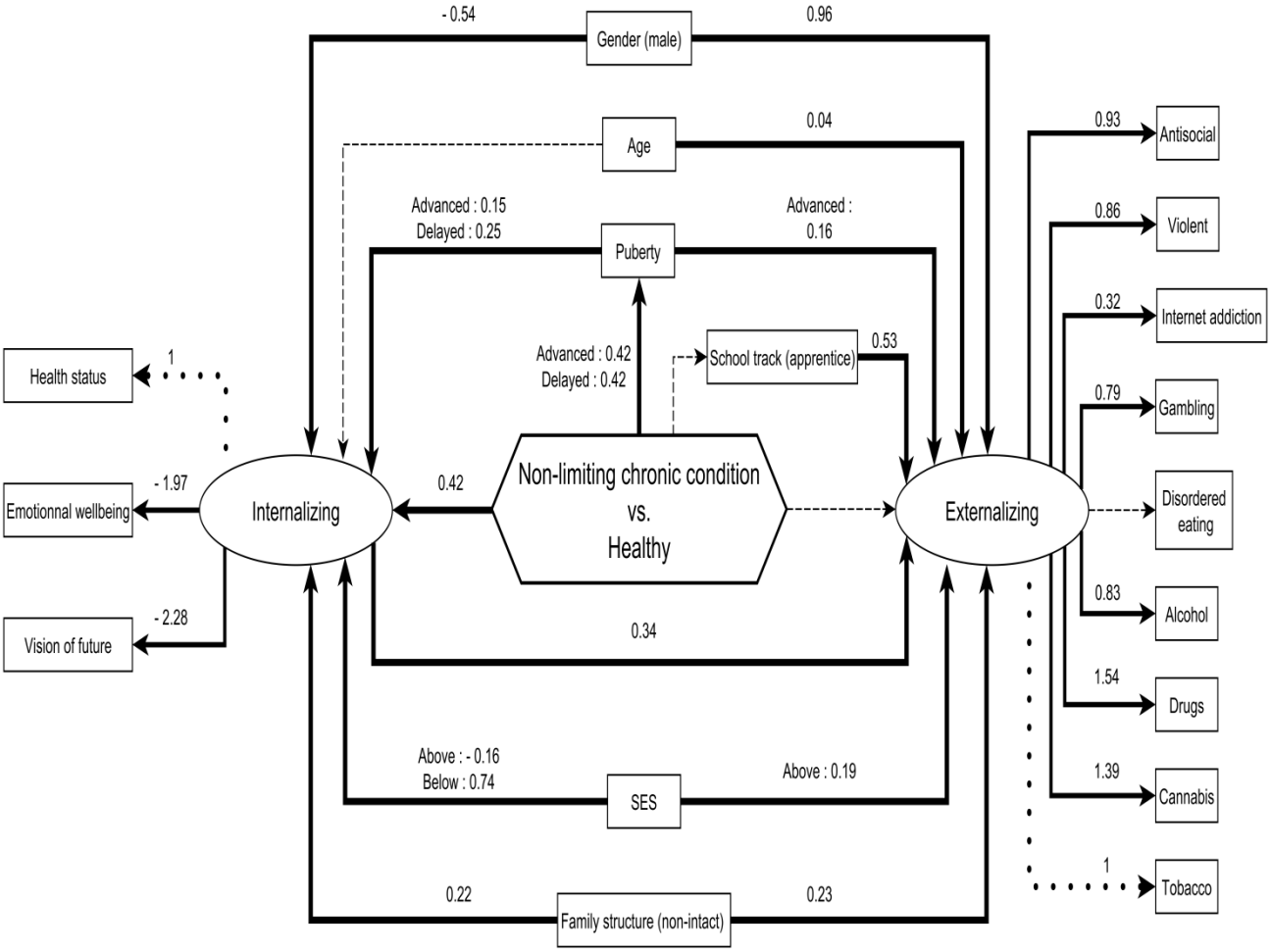
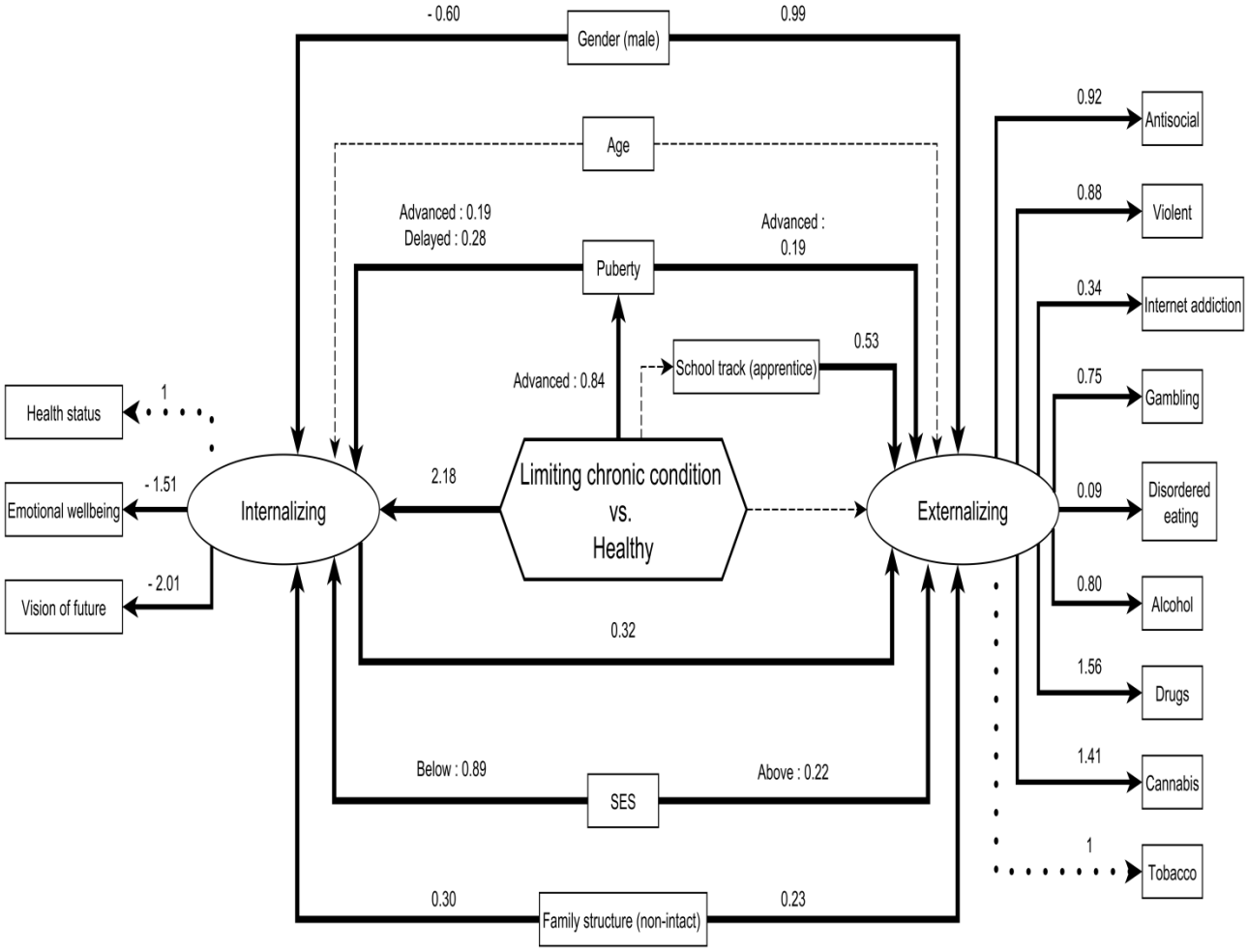


Figure 3. Model 3: Severity of chronic conditions: healthy vs. limiting conditions (only coefficients significant at the 95% level are given)



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