Quality of life in relation to future mental health problems and offending

Testing the good lives model among detained girls

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Link to publication

Quality of Life in Relation to Future Mental Health Problems and Offending: Testing the Good Lives Model Among Detained Girls

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Detained girls bear high levels of criminal behavior and mental health problems that are likely to persist into young adulthood. Research with these girls began primarily from a risk management perspective, whereas a strength-based empowering perspective may increase knowledge that could improve rehabilitation. This study examines detained girls' quality of life (QoL) in relation to future mental health problems and offending, thereby testing the strength-based good lives model of offender rehabilitation (GLM). At baseline, 95 girls (M_{age} = 16.25) completed the World Health Organization QoL instrument to assess their QoL prior to detention in the domains of physical health, psychological health, social relationships, and environment. Six months after discharge, mental health problems and offending were assessed by self-report measures. Structural equation models were conducted to test GLM's proposed (in)direct pathways from QoL (via mental health problems) toward offending. Although we could not find support for GLM's direct negative pathway from QoL to offending, our findings did provide support for GLM's indirect negative pathway via mental health problems to future offending. In addition, we found a direct positive pathway from detained girls' satisfaction with their social relationships to offending after discharge. The current findings support the potential relevance of addressing detained girls' QoL, pursuing the development of new skills, and supporting them to build constructive social contacts. Our findings, however, also show that clinicians should not only focus on strengths but that detecting and modifying mental health problems in this vulnerable group is also warranted.

Keywords: good lives model, psychopathology, young offenders, female adolescents, follow-up studies

Many detained female adolescents are involved in severe criminal behavior, such as robbery and physical violence (Lederman, Dakof, Larrea, & Li, 2004; Lenssen, Doreleijers, van Dijk, & Hartman, 2000). In addition, these girls bear high levels of mental health problems, with up to 95% having at least one psychiatric

disorder (Hamerlynck, Doreleijers, Vermeiren, Jansen, & Cohen-Kettenis, 2008; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Van Damme, Colins, & Vanderplasschen, 2014). The scant prospective research among detained girls has unambiguously shown that their mental health problems and criminal behavior persists into young adulthood (Teplin, Welty, Abram, Dulcan, & Washburn, 2012; van der Molen et al., 2013) and that many of these girls develop one or more personality disorders (Krabbendam et al., 2015). Of note, despite unfavorable circumstances, a small group of girls appear to function surprisingly well later in life (Krabbendam et al., 2015; van der Molen et al., 2013).

It is not well understood why some girls recover from mental health problems or desist from future criminal involvement whereas others do not. This could arise in part because the majority of prospective studies with detained girls has focused on risk factors associated with the persistence of mental health and adjustment problems. These studies, of course, are relevant from a risk management perspective as they help clinicians to develop and provide interventions that are mainly oriented toward solving problems and reducing risk factors. Nevertheless, research that adds the enhancement of one's quality of life (QoL) to the management of risk is

urgently warranted. Studies that apply this strength-based perspective may inform clinicians, for example, how to support offenders in building skills and developing more fulfilling and socially acceptable lifestyles, which is thought to be linked to the reduction of risk (Fisher, Morgan, Print, & Leeson, 2010; Wainwright & Nee, 2014; Wylie & Griffin, 2013). The present study was designed to fill this void by addressing detained girls' QoL in relation to future mental health problems and offending, thereby testing the strength-based good lives model of offender rehabilitation (GLM; Ward, 2002).

The GLM offers a rehabilitation framework for adult offenders. It forms a theoretical framework to explain relapse and reoffending, introducing QoL as a central concept. According to the GLM, humans want to realize a range of primary goods or basic needs (e.g., inner peace and relatedness), and achieving these needs contributes to their QoL. The GLM consists of two main assumptions: that mental health problems are obstacles that hamper the achievement of a good QoL (first GLM assumption) and that individuals who are confronted with a poor QoL may become involved in antisocial activities through either a direct or indirect pathway (second GLM assumption; Ward, 2002). The direct pathway implies that someone actively commits antisocial behaviors as an alternative strategy to reach a satisfying QoL (e.g., stealing instead of working to obtain material well-being). The indirect pathway implies that an individual's poor QoL generates a gradual accumulation of negative experiences and deteriorating circumstances that trigger a chain of mental health problems, such as depressed feelings, often followed by alcohol/drug use. Ultimately, he or she loses control of the situation and becomes involved in criminal activities (Purvis, Ward, & Willis, 2011; Ward, Mann, & Gannon, 2007).

The GLM has been applied to a broad range of offender populations (Purvis et al., 2011) yet only rarely to detained adolescents. We are aware of only one empirical study that tested the GLM in detained adolescents. Van Damme and colleagues (2015) scrutinized detained girls' QoL prior to detention and tested whether mental health problems impeded their QoL (first GLM assumption). The self-perceived QoL of these detained girls suggested

that, overall, they were quite satisfied with their life. This study revealed some clear differences between distinct domains of QoL, supporting a multidimensional conceptualization of QoL (Cummins, Lau, & Stokes, 2004; Verdugo, Schalock, Keith, & Stancliffe, 2005). Detained girls were more satisfied with particular domains (e.g., their social relationships) compared with other domains of QoL (e.g., their psychological health). Also, each domain of QoL was affected by specific mental health problems. In support of the GLM's first assumption, psychiatric disorders were negatively related to detained girls' QoL (Van Damme et al., 2015). The cross-sectional nature of this latter study (Van Damme et al., 2015) did not allow to determine whether a low QoL increased the odds of future mental health problems and offending (second GLM assumption). The few empirical studies in adult offenders testing this second GLM assumption indicated that a low QoL does put them at risk for recidivism (Bouman, Schene, & de Ruiter, 2009; Willis & Grace, 2008; Willis & Ward, 2011) and supported the existence of the abovementioned direct and indirect pathways toward offending (Purvis, 2010).

The present study extended those preliminary findings to test GLM's second assumption in a sample of detained girls, focusing on QoL prior to detention in relation to mental health problems and offending 6 months after discharge (see Figure 1). We included multiple domains of QoL (i.e., physical health, psychological health, social relationships, environment), different types of mental health problems (i.e., anger−irritability, alcohol/drug use, depression−anxiety), and different types of offenses (i.e., nonviolent and violent). The first objective was to explore associations between the variables of interest, expecting girls with the lowest QoL scores to have the highest rates of mental health problems and offending after discharge. The second objective was to test the direct pathway toward offending, assuming that QoL negatively influenced the girls' offending after discharge. The third objective was to test the indirect pathway toward offending, assuming that QoL negatively influenced their offending behavior via mental health problems. On the basis of a multidimensional conceptualization of QoL, we expected that the relationships and pathways would differ according to the domain of QoL.
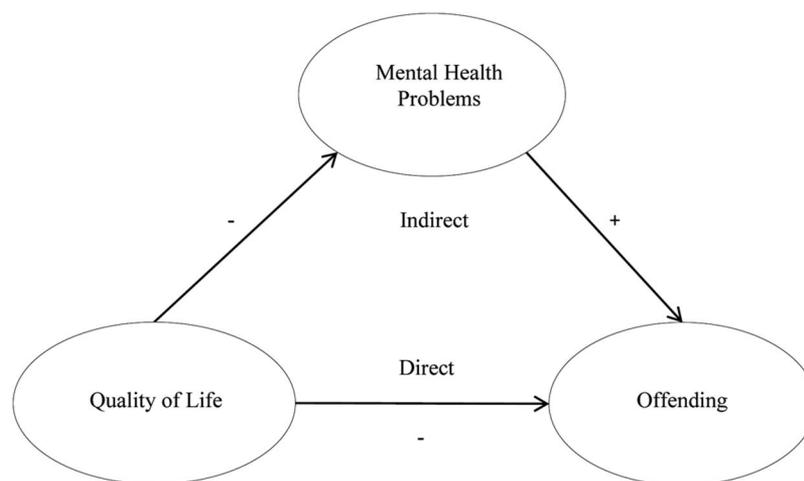

Figure 1. Hypothesized model: The good lives model of offender rehabilitation (GLM). (In)direct routes from quality of life (over mental health problems) to offending (see Purvis, 2010).

Method

Participants

The participants were 95 girls who had been placed in an all-girl youth detention center (YDC) in Flanders, Belgium. Girls are referred to this YDC by a juvenile judge when charged with a criminal offense or because of an urgent problematic educational situation (e.g., truancy, running away, aggression, or prostitution). Only girls demonstrating the most severe criminal and behavioral problems are placed in this YDC. At baseline (i.e., at the start of detention), girls were eligible to participate if the following criteria were met: (a) being adjudicated to be placed in the YDC for at least 1 month, (b) having sufficient knowledge of Dutch, and (c) having sufficient cognitive abilities to read and understand the questions. Between February 2012 and June 2014, 147 girls participated in the baseline measurement. Six months after discharge, these girls were approached to participate in the follow-up measurement. By February 2015, 136 girls were eligible to be included for follow-up assessment, as they had been discharged for 6 months. Of the 136 girls, 38 girls and/or their parents refused participation, and 3 could not be located, leaving 95 girls to be included in the present study (follow-up rate = 70%). These 95 girls were not significantly different from the girls who were not included in the present study ($n = 41$) regarding sociodemographic features and QoL scores at baseline (details available on request), with one exception: Girls included in this study ($n = 95$) had a significantly lower mean score for the QoL domain psychological health ($M = 52.05$; $SD = 20.96$) compared with the 41 girls who dropped out ($M = 60.98$; $SD = 19.52$; $t = 2.33[134]$, $p = .022$). Descriptive data ($n = 95$) regarding age, ethnic origin, past detention, time in detention, and reincarceration during the follow-up period are presented in Table 1.

Procedure

Participants were approached and assessed following a standardized protocol. Each girl received oral and written information about the aims, content, and duration of the study. The girls were assured that their information would be treated confidentially and that refusal to participate would not affect their judicial status or stay in the YDC. Written informed consent was given before starting the assessment. The girls' parents received a letter with information about the aims and practical aspects of the study and could refuse participation. The girls were assessed within the first 3 weeks of placement (baseline) and 6 months after discharge (follow-up; range: 5.39–8.64 months; $M = 6.17$; $SD = .46$). At baseline, participants were assessed in a private area in the YDC. The assessment was conducted by the first author of this article or final-year university students. Participants did not receive financial compensation at that stage of the study. At follow-up, the assessment took place outside the YDC at a time and place that were most convenient for each girl. To increase the response rate, the girls were contacted about three months after discharge, to check how they were doing and to remind them of the upcoming follow-up measurement. They received a gift voucher for participation at follow-up, as this assessment required an extra effort. This study was approved by the Institutional Review Board of the Faculty of Psychology and Educational Sciences at Ghent University and by the Board of the YDC.

Baseline Measures

Sociodemographics. At baseline, standardized information regarding age, ethnic origin, and detention history was gathered by means of a sociodemographic questionnaire, which was used in previous studies among detained adolescents (e.g., Colins, Vermeiren, Schuyten, & Broekaert, 2009). Age refers to the girls' age at baseline. Origin was operationalized by dichotomizing the girls' ethnic descent (i.e., Belgian vs. non-Belgian). The dichotomous variable "past detention" indicates whether the girl had been detained in the past. In addition, for each girl, the duration of the current detention period was calculated, expressed in months.

QoL. QoL was assessed at baseline, using the Dutch version of the WHOQOL-BREF, an abbreviated version of the WHOQOL-100 (WHOQOL GROUP, 1998). The WHOQOL-BREF has been demonstrated to be a reliable and valid self-report instrument in adults (Trompenaars, Masthoff, Van Heck, Hodiamont, & De Vries, 2005) and adolescents (Agnihotri, Awasthi, Singh, Chandra, & Thakur, 2010; Chen et al., 2006). As we were interested in the situation of the girls at the moment they entered the YDC, the reference period of the WHOQOL-BREF was changed from the "last 2 weeks" to "the 2 weeks before detention" (see also Van Damme et al., 2015). This was done to reduce the degree to which girls' QoL self-reports might be biased by conditions they experienced in detention (e.g., low self-perceived quality of social relationships because they are not allowed to have contact with their friends; Barendregt, van der Laan, Bongers, & van Nieuwenhuizen, 2012). Participants answered all items on a 5-point rating scale, ranging from 1 (*very poor*) to 5 (*very good*). The WHOQOL-BREF includes four subscales to assess QoL in the domains of physical health (7 items; $\alpha = .71$ in the current study), psychological health (6 items; $\alpha = .86$), social relationships (3 items; $\alpha = .76$), and environment (8 items; $\alpha = .84$). Subscale scores ranged from 0 to 100, with higher scores indicating a better QoL.

Follow-Up Measures

Reincarceration. This dichotomous variable indicates whether or not the girl had been reincarcerated during the follow-up period.

Mental health problems. The Dutch translation of the Massachusetts Youth Screening Instrument-Second Version (MAYSI-2; Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001) was used to assess the mental health problems of the girls at follow-up. This self-report questionnaire includes 52 *yes/no* items indicating the presence or absence of symptoms related to mental health problems in the last few months (Grisso et al., 2001). The 52 items are organized into six subscales by adding up the items of interest. To maximize the statistical power, we deliberately selected the most relevant MAYSI-2 subscales. As the GLM considers substance abuse, feelings of frustration, loneliness and distress to play an important role in the indirect pathway from QoL toward offending (Purvis et al., 2011; Ward et al., 2007), we decided to include the eight-item scale alcohol/drug use (range: 0–8; $\alpha = .84$), the nine-item scale angry–irritable (range: 0–9; $\alpha = .85$), and the nine-item scale depressed–anxious (range: 0–9; $\alpha = .81$). Each subscale has a "caution" cutoff (identifying youths who may be in need of clinical attention) and a "warning" cutoff (identifying scores displayed by the top 10% of youths in the original U.S.

sample, reflecting youth who are even more in need of clinical attention; Vincent, Grisso, Terry, & Banks, 2008).

Offending. Offending was measured at follow-up, using a self-report questionnaire (van der Laan & Blom, 2005). All items began with the standardized question, "Have you ever . . .". As we were particularly interested in the girls' offending behavior in the course of the 6 months after discharge, the reference period of the questionnaire was changed from "ever" to "the 6 months after discharge". In line with prior research involving detained girls (Colins & Andershed, 2015), two continuous variety scores were created, indicating the total number of different nonviolent or violent items the girl reported. Nonviolent offending reflects the total number of 20 different nonviolent items, of which 15 items represent property offenses (e.g., shoplifting and vandalism), two items represent insults, and three items pertain to drug dealing (range: 0–20; α = .88). The violent offending score reflects the total number of seven different violent items the girl reported (e.g., fighting and threats; range: 0–7; α = .75).

Previously detained youngsters might be reluctant to report their offending behavior after discharge. Therefore, the guarantee of confidentiality was repeated once more just before the girls started to complete the offending questionnaire. The researcher explicitly stated that none of their answers would be reported to their parents, caregivers, policemen, or others. The guarantee of confidentiality was visualized by means of an envelope, which contained all questionnaires and was closed at the end of the assessment. The assessment was conducted individually, in a separate room. In addition, youngsters filled out the questionnaires by themselves, without the researcher looking over their shoulder. The above conditions are considered to promote accurate reporting (van der Laan & Blom, 2005).

Statistical Analyses

First, we calculated correlations to explore the relationship between QoL prior to detention and mental health problems and offending after discharge. Second, we conducted structural equation modeling to examine the effect of QoL on offending (cf., GLM's direct pathway) and whether this effect is mediated by mental health problems (cf. GLM's indirect pathway toward offending). Mental health problems and offending were entered as censored variables, using a Tobit model (Tobin, 1958), as a large part of the observations were situated at the minimum or maximum value of these variables; many girls had low scores for alcohol/drug use, depressed−anxious, nonviolent and violent offending, whereas the opposite was true for angry−irritable. Weighted least squares mean and variance adjusted estimation was used to estimate the models with censored variables. To evaluate the goodness of model fit, we relied on the chi-square test of model fit, the root mean squared error of approximation (RMSEA; Steiger & Lind, 1980), and the comparative fit index (CFI; Bentler, 1990). We used a nonsignificant chi-square test of model fit, RMSEA values of < .05 and CFI values of > .90 as good fit indices (Hu & Bentler, 1999). The significance of the indirect effects was examined by means of 95% bias-corrected bootstrap confidence intervals (Fritz & MacKinnon, 2007; Geiser, 2013; Hayes & Scharkow, 2013). Confidence intervals that do not include zero indicate significant indirect effects. Because we used concurrent measures for the mediator (mental health problems) and outcome variable (offending) and because it cannot be excluded that offending has an impact on mental health problems, we also conducted additional models to check for reversed indirect effects.

We included sociodemographic characteristics in the model to gain insight into the relationships between QoL, mental health problems, and offending, after controlling for sociodemographic covariates. The selection of sociodemographic covariates was based on prior theoretical and empirical indications that ethnic origin (Ng, Lim, Jin, & Shinfuku, 2005; Utsey, Chae, Brown, & Kelly, 2002) and detention history (Barendregt et al., 2012; van Nieuwenhuizen, Schene, & Koeter, 2002) are likely to influence QoL, while age (Najman et al., 2009; Pepler, Jiang, Craig, & Connolly, 2010), duration of detention (Cottle, Lee, & Heilbrun, 2001; Florsheim, Behling, South, Fowles, & DeWitt, 2004), and reincarceration (Cottle et al., 2001; Kingree, Phan, & Thompson, 2003) are likely to influence offending. SPSS 22 was used to examine differences between girls who were included (n = 95) and those who were not included (n = 41) in the present study, and

Table 1

Correlations [95% Confidence Intervals] Among Demographic Characteristics, Quality of Life (QoL), Mental Health Problems, and Offending

Variable	1	2	3	4	5	6
1. Age						
2. Belgian origin[a]	.06 [−.15, .26]					
3. Past detention[a]	.31 [.08, .54]	.18 [<−.00, .36]				
4. Duration current detention	−.23 [−.39, −.08]	−.25 [−.48, −.03]	−.36 [−.57, −.14]			
5. QoL physical health	.13 [−.04, .31]	−.07 [−.25, .11]	−.14 [−.33, .05]	.02 [−.22, .25]		
6. QoL psychological health	.04 [−.13, .21]	.07 [−.12, .27]	−.12 [−.33, .09]	−.06 [−.26, .16]	.67* [.57, .78]	
7. QoL social relationships	.08 [−.12, .28]	−.04 [−.23, .15]	−.02 [−.23, .20]	.09 [−.16, .35]	.55* [.41, .69]	.67* [.54, .79]
8. QoL environment	−.02 [−.22, .18]	−.02 [−.18, .14]	−.18 [−.36, <−.00]	.03 [−.16, .22]	.70* [.60, .80]	.71* [.62, .80]
9. Reincarceration[a]	−.39* [−.55, −.23]	−.07 [−.27, .14]	−.01 [−.21, .19]	.10 [−.09, .29]	−.13 [−.32, .06]	−.10 [−.29, .09]
10. Alcohol/drug use	−.10 [−.29, .10]	.08 [−.13, .29]	.14 [−.08, .35]	−.06 [−.28, .15]	−.17 [−.37, .02]	−.14 [−.33, .06]
11. Angry−irritable	−.26 [−.44, −.07]	−.01 [−.22, .20]	−.01 [−.23, .22]	.17 [−.03, .36]	−.36* [−.52, −.20]	−.40* [−.55, −.25]
12. Depressed−anxious	−.09 [−.29, .11]	−.02 [−.22, .18]	.05 [−.18, .29]	.07 [−.13, .27]	−.38* [−.55, −.21]	−.41* [−.56, −.25]
13. Nonviolent offending	−.39* [−.58, −.20]	<−.00 [−.22, .21]	.04 [−.18, .26]	.10 [−.09, .30]	−.20 [−.42, .02]	−.05 [−.25, .15]
14. Violent offending	−.38* [−.59, −.18]	.03 [−.20, .26]	.09 [−.14, .32]	.16 [−.05, .36]	−.29 [−.48, −.10]	−.30 [−.47, −.12]

[a] Values represent sample sizes and percentages, respectively, rather than means and standard deviations.
* p < .001.

to conduct descriptive analyses. The software package *Mplus* (Muthén & Muthén, 1998−2007) was used to calculate correlations between variables of interest and to test the fit of the proposed models to the data.

Results

Descriptive Information

Descriptive data regarding detained girls' QoL, mental health problems and offending, are presented in Table 1. The girls were most satisfied with their social relationships ($M = 74.91$; $SD = 21.04$) and least satisfied with their psychological health ($M = 52.05$; $SD = 20.96$). Six months after discharge, the mean score for angry−irritable was 4.73 ($SD = 2.93$; Caution zone (Cau) = 31.6%; Warning zone (War) = 23.2%), for depressed−anxious 3.40 ($SD = 2.65$; Cau = 29.5%; War = 27.4%) and for alcohol/drug use 2.51 ($SD = 2.48$; Cau = 23.3%; War = 9.5%). Six months after discharge, the mean variety score for nonviolent and violent offending was 2.42 ($SD = 3.59$) and .87 ($SD = 1.29$), respectively. The persistence of offending behavior after discharge is also reflected by the total frequency scores for both nonviolent offending (range: 0−605; $M = 40.94$, $SD = 112.42$) and violent offending (range: 0−170; $M = 9.11$; $SD = 30.08$; details available on request).

QoL in Relation to Mental Health Problems and Offending After Discharge

Table 1 also presents correlations between QoL and variables of interest. All QoL domains except one (i.e., social relationships) were significantly negatively correlated with the MAYSI-2 angry−irritable and depressed−anxious scores after discharge ($p < .001$). Yet, QoL was not significantly related to alcohol/drug use and offending behavior after discharge ($p > .001$).

Pathways to Offending

First, we fitted a mediation model with paths from QoL to mental health problems and offending, and from mental health problems to offending, while controlling for sociodemographic characteristics. This model (Model 1) is considered a parsimonious model, as latent variables were created based on the girls' scores on the different domains and types of QoL, mental health problems and offending, with the variances of the latent variables being fixed at one. The model was specified by allowing the factor loadings and paths to be freely estimated. The model provided a satisfactory fit to the data, $\chi^2(64, N = 95) = 71.7$, $p = .237$, RMSEA = .036, 90% CI [.000, .073], CFI = .959. The results supported the hypothesized mediation effect from QoL to offending via mental health problems (see Figure 2). The path from QoL to offending was not significant ($b = .04$, 95% CI [−.01, .10], $p = .139$, $\beta = .14$), whereas we found a significant direct negative effect of QoL on mental health problems ($b = −.07$, 95% CI [−.11, −.02], $p = .002$, $\beta = −.46$), and direct positive effect of mental health problems on offending ($b = 1.53$, 95% CI [.93, 2.13], $p < .001$, $\beta = .70$). In addition, the indirect negative effect of QoL via mental health problems on offending was significant ($b = −.10$, 95% CI [−.16, −.04], $p = .001$, $\beta = −.32$). The significance of this indirect effect was confirmed by the 95% bias-corrected bootstrap CI, while the reversed indirect effect appeared to be nonsignificant (see Table 2). Model 1 explained 21% and 77% of the variance in the latent variables mental health problems and offending, respectively.

Next, on the basis of our multidimensional approach of QoL, we tested the (in)direct effects of the different domains of QoL on offending. We fitted four mediation models (Models 1a-d), using the subscales of the WHOQOL-BREF as observed variables instead of the latent variable QoL. All models provided a satisfactory fit to the data: physical health (Model 1a), $\chi^2(32, N = 95) = 37.7$, $p = .225$, RMSEA = .043, 90% CI [.000, .091], CFI = .949; psychological health (Model 1b), $\chi^2(32, N = 95) = 41.6$, $p = .118$, RMSEA = .056, 90% CI [.000, .100], CFI = .914; social relationships (Model 1c), $\chi^2(32, N = 95) = 39.8$, $p = .161$, RMSEA = .051, 90% CI [.000, .096], CFI = .924; environment (Model 1d), $\chi^2(32, N = 95) = 36.1$, $p = .283$, RMSEA = .037, 90% CI [.000, .087], CFI = .962. In line with Model 1, the models for physical health (Model 1a), psychological health (Model 1b) and environment (Model 1d) indicated a significant indirect neg-

Table 1 (*continued*)

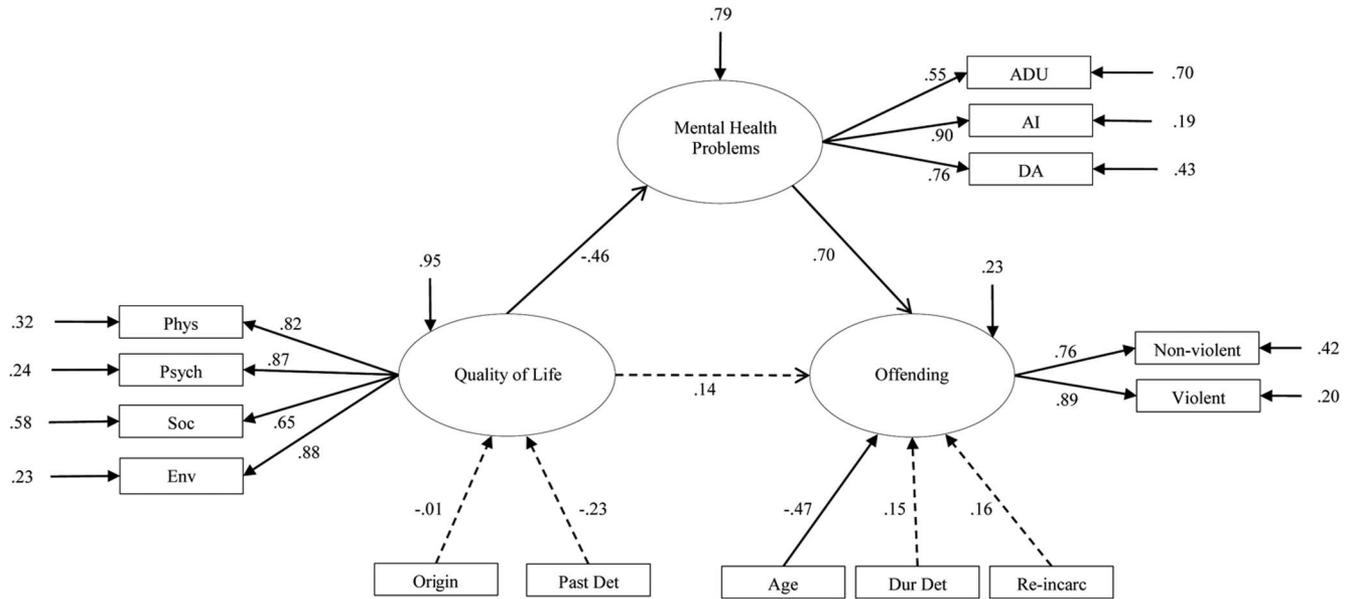|	7	8	9	10	11	12	13	14	M	SD
									16.25	1.07
									60	63.20
									23	24.20
									4.46	2.92
									62.89	15.96
									52.05	20.96
									74.91	21.04
	.60* [.46, .75]								62.94	18.40
	−.09 [−.29, .11]	−.03 [−.23, .17]							42	44.20
	−.08 [−.30, .13]	−.19 [−.39, .01]	.20 [.01, .39]						2.51	2.48
	−.27 [−.47, −.06]	−.29* [−.45, −.14]	.15 [−.04, .34]	.49* [.35, .63]					4.73	2.93
	−.23 [−.40, −.05]	−.32* [−.50, −.15]	.12 [−.08, .33]	.38* [.22, .55]	.74* [.65, .83]				3.40	2.65
	.12 [−.11, .36]	−.08 [−.28, .13]	.27 [.07, .47]	.70* [.58, .81]	.53* [.40, .67]	.39* [.21, .57]			2.42	3.59
	−.06 [−.30, .18]	−.25 [−.44, −.07]	.29 [.09, .49]	.60* [.46, .74]	.62* [.48, .76]	.38* [.18, .57]	.68* [.54, .83]	—	.87	1.29

Figure 2. Model 1: Structural equation model of mediation effects of offending (standardized parameter estimates). Dashed lines indicate nonsignificant path estimates ($p > .05$); solid lines indicate significant path estimates ($p < .05$). Past Det = past Detention; Dur Det = duration of current detention; Reincarc = reincarceration; Phys = physical health; Psych = psychological health; Soc = social relationships; Env = environment; ADU = alcohol/drug use; AI = angry−irritable; DA = depressed−anxious.

ative effect of QoL on offending via mental health problems, but no direct effect of QoL on offending (details available upon request from the first author). Again, the significance of these indirect effects was confirmed by the 95% bias-corrected bootstrap confidence intervals. Here, a significant reversed indirect effect was found for the domain of physical health only (see Table 2). The model for social relationships (Model 1c) yielded somewhat different results, supporting an indirect but also a direct effect of QoL on offending (see Figure 3). We found a significant direct positive effect of QoL on offending ($b = .05$, 95% CI [.02, .08], $p = .005$, $\beta = .23$), a negative effect of QoL on mental health problems ($b = -.03$, 95% CI [$-.05$, $-.01$], $p = .008$, $\beta = -.27$), a positive effect of mental health problems on offending ($b = 1.50$, 95% CI [1.03, 1.97], $p < .001$, $\beta = .75$), and an indirect negative effect of QoL via mental health problems on offending ($b = -.04$, 95% CI [$-.07$, $-.01$], $p = .008$, $\beta = -.20$). The significance of this indirect effect was confirmed by the 95% bias-corrected bootstrap CI. The reversed indirect effect was not significant (see

Table 2). In this model, 7% of the variance in the latent variable mental health problems and 89% of the variance in the latent variable offending were explained by the variables in the model.

Discussion

This study examined detained girls' QoL prior to detention in relation to mental health problems and offending 6 months after discharge, in a sample of 95 girls from a YDC in Flanders, the Dutch speaking part of Belgium. Overall, girls with the lowest QoL scores had the highest rates of mental health problems after discharge, but were not at increased risk for future offending. Although we could not find support for a direct negative pathway from QoL to offending, our findings did provide support for the indirect pathway via mental health problems to offending. This indicates that a low QoL increases the risk of mental health problems, which in turn increases the risk on offending. In addition, our findings revealed a direct positive pathway from detained

Table 2
Indirect Effects With 95% Bias-Corrected Bootstrap Confidence Interval (CI)

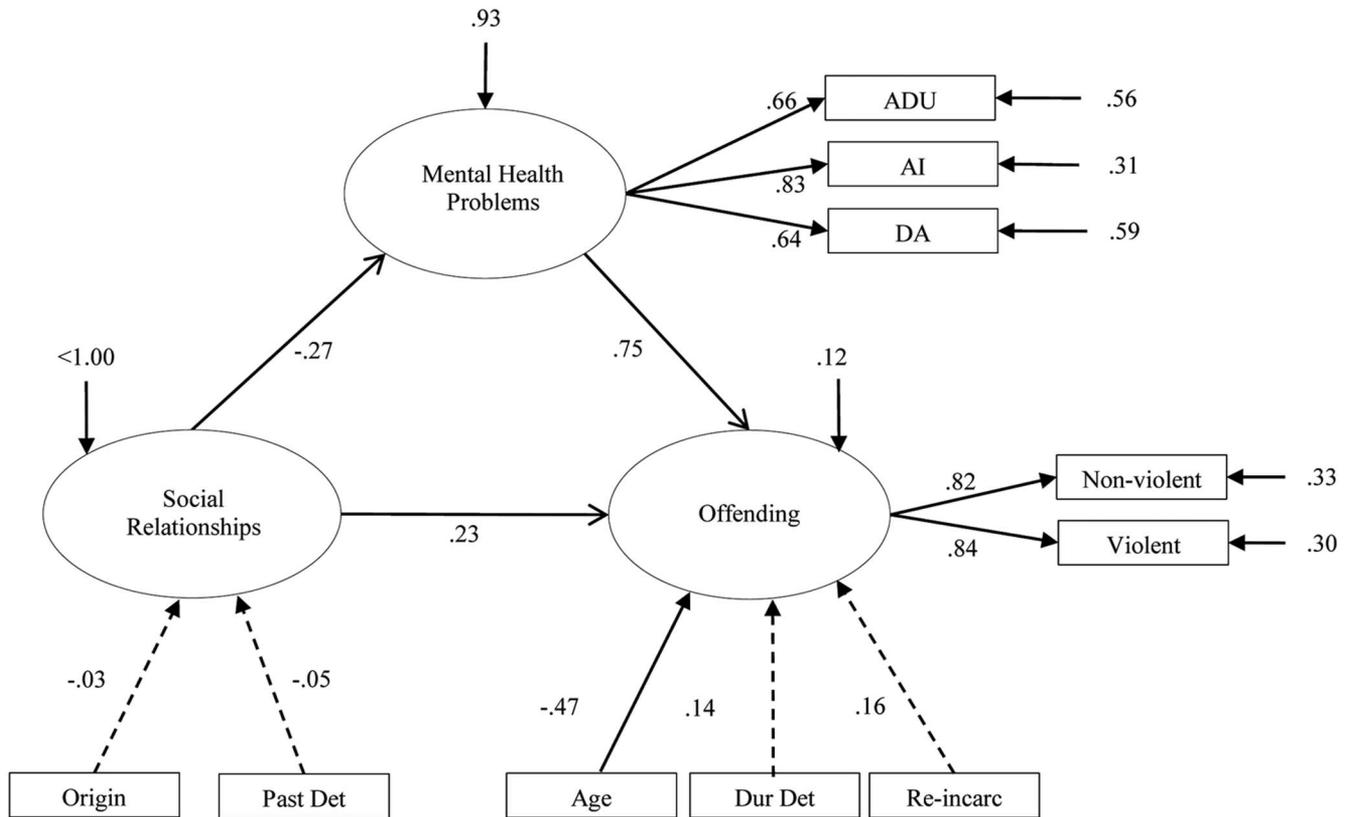| Model	Variable	Indirect Effect Mental Health as Mediator b (95% CI)	Reversed Indirect Effect Offending as Mediator b (95% CI)
1	QoL	−.10 (−.18, −.06)	−.02 (−.05, .01)
1a	QoL Physical Health	−.08 (−.17, −.03)	−.02 (−.05, <−.00)
1b	QoL Psychological Health	−.07 (−.13, −.02)	−.02 (−.05, .01)
1c	QoL Social Relationships	−.04 (−.16, <−.00)	> .00 (−.02, .02)
1d	QoL Environment	−.07 (−.14, −.02)	−.02 (−.06, >.00)

Note. QoL = Quality of life.

Figure 3. Model 1c: structural equation model of mediation effects of offending (standardized parameter estimates). Dashed lines indicate nonsignificant path estimates ($p > .05$); Solid lines indicate significant path estimates ($p < .05$). Past Det = past Detention; Dur Det = duration of current detention; Reincarc = reincarceration; Phys = physical health; Psych = psychological health; Soc = social relationships; Env = environment; ADU = alcohol/drug use; AI = angry–irritable; DA = depressed–anxious.

girls' satisfaction with their social relationships to offending after discharge. This suggests that the more girls are satisfied with their social relationships the more likely they are to reoffend.

The results of the current study clearly support the presence of an indirect route to offending, as previously found among adult offenders (Purvis, 2010). A low QoL placed detained girls at risk for mental health problems, which placed them at risk for offending subsequently. Detained girls' QoL and mental health problems, together with the selected sociodemographic variables, could explain the vast majority of the variance in offending after discharge (i.e., 77%). Moreover, the indirect pathway from detained girls' QoL to offending was found for the overall latent QoL variable, as well as for each domain of QoL separately. Only exceptionally (i.e., for the QoL domain of physical health) a reversed indirect effect was revealed, which suggests that mental health problems are more likely to result in offending than vice versa, when considering the indirect GLM route. The prominent appearance of an indirect route from QoL via mental health problems to offending among detained girls yields some interesting insights pertaining to the rehabilitation of this particularly vulnerable group. Recent studies in samples of juvenile offenders have recommended a strength-based empowering approach, over a more traditional, problem-oriented one (Thakker, Ward, & Tidmarsh,

2006; Wainwright & Nee, 2014; Wylie & Griffin, 2013). For example, starting off by exploring the youngsters' own perception of QoL, instead of immediately focusing on specific problems, has been shown to be a less threatening and more motivating approach (Fisher et al., 2010). The current findings acknowledge the potential relevance of addressing one's QoL. However, they strongly point to a pivotal role of mental health problems in the pathways toward offending, a finding that argues against an exclusive focus on strengths and empowerment. Put differently, and regardless of the importance of a strength-based approach, our findings suggest the need for appropriate methods for detecting and modifying mental health problems in this vulnerable group (Teplin et al., 2002; Van Damme et al., 2014; Wasserman, McReynolds, Ko, Katz, & Carpenter, 2005).

The results of the current study did not support a direct negative effect of detained girls' QoL on offending. This contrasts with the scant empirical research among adult offenders suggesting that a low QoL is a risk factor for recidivism (Bouman et al., 2009; Willis & Grace, 2008; Willis & Ward, 2011). The lack of a direct negative effect in our sample might be because the GLM is developed as a rehabilitation framework for adult, not adolescent, offenders (Ward, 2002). Although offending among adults might be primarily guided by their own unmet needs and a poor QoL,

offending among adolescents might also be susceptible to external influences, such as affiliation with deviant peers (Lederman et al., 2004). Another explanation is that the basic needs of adolescents are generally served by their surroundings, and that these needs therefore may not be the most prominent force guiding one's behavior. Yet, when entering adulthood and becoming more and more financially and socially responsible to fulfill their own basic needs, some adolescents may eventually become actively involved in criminality to reach a satisfying QoL. A strength-based empowering approach might pursue the development of new skills and abilities, thereby providing adolescents with desirable and socially acceptable means to obtain a good QoL before they reach adulthood (Wylie & Griffin, 2013). However, the highly structured and almost artificial nature of detention forms a major challenge, as it restricts the youngsters' autonomy and hampers the possibility to develop and practice new skills (Anthony et al., 2010; Barendregt et al., 2012).

The present study found a direct positive effect of detained girls' satisfaction with their social relationships on offending after discharge. Although this finding does not dovetail with prior work in adult offenders (Bouman et al., 2009; Willis & Grace, 2008; Willis & Ward, 2011), it indicates that the more girls are satisfied with their social relationships the more likely they are to reoffend. The exclusive direct impact of the social domain of QoL (compared with the other domains) on girls' offending supports a multidimensional conceptualization of QoL, and converges with the GLM assertion that individuals attach different priorities to the different domains of QoL (Ward & Gannon, 2006). The particular importance of the social domain fits within the developmental period of adolescence, when peers become increasingly important and influential (Berk, 2006). The finding that detained girls' satisfaction, not dissatisfaction, with their social relationships increases the risk of offending after discharge coincides with the idea that antisocial minors often feel popular among peers and surrounded by close friends (Vermeiren, Bogaerts, Ruchkin, Deboutte, & Schwab-Stone, 2004). More specifically, detained girls often affiliate with deviant peers (Lederman et al., 2004), which fosters further engagement in criminal activities (Melde & Esbensen, 2013).

The above findings regarding the social domain of QoL yield implications for both research and practice. In line with prior work (Wainwright & Nee, 2014; Whitehead, Ward, & Collie, 2007; Willis, Prescott, & Yates, 2013), we suggest that future research regarding the GLM should pay particular attention to negative peer group affiliation and gang membership as inappropriate ways of satisfying detained minors' primary goods of relatedness and community/group involvement. In this respect, a qualitative (instead of quantitative) research approach seems useful: for example, asking youngsters about the priority they assigned to different primary goods at the time of offending, and how they operationalized different primary goods at that time (Barnett & Wood, 2008; Chu, Koh, Zeng, & Teoh, 2015). We suggest treatment to support youngsters in building, strengthening, and extending constructive, instead of destructive, social contacts, by offering peer-helping programs, such as EQUIP. In the EQUIP program detained juveniles help each other to decrease self-serving cognitive distortions and to strengthen their moral and social skills (Brugman & Bink, 2011).

This study has several strengths, including the longitudinal design and the use of an understudied but highly relevant population to test the GLM. Nevertheless, the results should be inter-

preted in the context of some limitations. First, the girls included in this study had a significantly lower mean score for the QoL domain of psychological health than the girls who dropped out. This may have contributed to the clear presence of the GLM's indirect route from QoL over mental health problems to offending and the lack of the GLM's direct negative route from QoL to offending in the current sample. To further evaluate the indicated pivotal role of mental health problems in pathways to offending future studies are warranted to examine if these findings can be replicated in other samples of detained girls.

Second, all data were gathered by means of self-report methods. Self-report has been shown to provide valid information about both mental health problems (Colins, Vermeiren, Schuyten, Broekaert, & Soyez, 2008) and offending (Enzmann & Podana, 2010), and has been deemed necessary for tracing adolescents' QoL. However, measurement bias cannot be excluded. Among detained youngsters, over- or underreporting is likely to occur. For example, it may occur due to reluctance to disclose information that (allegedly) may be used against them, due to difficulties to accurately recall (the frequency of) certain feelings, thoughts or behaviors, or due to features of the youngsters themselves (e.g., a depressed mood). With regard to the measurement of mental health problems, other informants, such as parents, are rarely available when working with detained youth. Therefore, alternative sources, such as clinical ratings or observational information of detention personnel, are urgently needed. Regarding offending, we suggest further research to complement self-report with official records of recidivism.

Third, because of time constraints, the current study had a follow-up assessment at 6 months after discharge. By that time, only some of the girls had reached adulthood. Longitudinal studies with a longer follow-up period are needed to explore to what extent the GLM, which was originally developed as a rehabilitation framework for adult offenders, pertains to adult females who were detained during adolescence.

Fourth, we did not have precise information on the length of time of the girls' reincarceration during the follow-up period. Future longitudinal studies should take into account that reincarceration influences the time in the community and the opportunity of recidivism.

Fifth, the small sample size forced us to construct latent variables, so as to include only a strict selection of variables, and to specify only a strict selection of pathways. As a consequence, we tested only the direct and indirect pathways referring to the GLM's second main assumption (see Figure 1) and did not test a wide range of alternative causal pathways (i.e., we, for example, did not take into account the influence of baseline mental health problems on detained girls' QoL). Although it may be difficult, future longitudinal research in a larger sample of detained girls is needed to test an integral model, considering all variables at all time points, to better understand the temporal order and possible bidirectional pathways between QoL, mental health problems and offending.

Finally, the small sample size also forced us to fit four separate mediation models to test the (in)direct effects of the different domains of QoL on offending. Future research is needed to test whether our findings can be replicated in a larger sample of detained girls, testing only one model, which includes the different domains of QoL simultaneously. This may have important theo-

retical implications, yielding more insight in the multidimensional nature of QoL and the specificity and importance of each domain of QoL in explaining detained girls' mental health problems and offending after discharge.

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