



# Improving Health to Reduce Risk of Youth Reoffending: Results of a Nurse Navigator Program for People Involved in the Youth Justice System

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## Abstract

Emerging research demonstrates that poor health is a predictor of offending and that this relationship may be mediated by other known predictors, including problems in education and family relationships. This study examines the initial results of a new program in Queensland, Australia that aims to lower the risk of reoffending among young people by providing targeted healthcare assistance. The results show that the program improved the overall health of the participants. Importantly, it also led to improvements in other domains that are known predictors of offending, despite no direct assistance being provided in those domains. Therefore, this study lends support to the research outcomes showing there may be causal links between health and known predictors of offending. This finding demonstrates that assistance in healthcare should be considered when designing programs for young people who have been involved in the justice system.

**Keywords:** Adolescent health services; criminal justice; offenders; young adults; nurse-led clinic.

## Introduction

### *Health of Young People Who Offend*

Young people involved in the youth justice system are known to experience substantially lower levels of health than the rest of the population. Non-communicable diseases such as asthma, diabetes, pneumonia and hypertension are more prevalent in this cohort (Winkelman et al., 2017), as are communicable diseases, including sexually transmitted infections (Borschmann et al., 2020; Gergelis et al., 2016; Sattler, 2017). Young people engaged with the youth justice system have higher rates of mental



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illness (Barnert et al., 2016; Casswell et al., 2012; Gergelis et al., 2016), neurological disabilities (Kincaid & Sullivan, 2019), traumatic head injuries (Borschmann et al., 2020) and foetal alcohol spectrum disorder (Bower et al., 2018; Jonsson et al., 2018) than the general youth population. They also have worse dental health (Gergelis et al., 2016). Moreover, young people involved in the justice system also have difficulties accessing healthcare, owing to a lack of knowledge of, or access to, services and when they do receive care, it tends to be inconvenient and fragmented (Barnert et al., 2020; Golzari & Kuo, 2013). In sum, this population suffers from profound health inequality.

### ***Health and Offending***

The poor health of young people involved in the youth justice system can partly be explained by common causal factors between health and offending (Caruso, 2017). Research on social determinants of health has demonstrated the powerful role of socioeconomic factors in shaping health outcomes (Braveman & Gottlieb, 2014). Similarly, criminological research has shown that socioeconomic and related social factors are also predictive of offending (Agnew, 2006).

However, recent research suggests that the relationship between health and offending is more complex than a simple correlation created by overlapping causes (Schroeder et al., 2011). First, involvement in the criminal justice system may have negative health consequences (Farrington, 1995; Vaughn et al., 2014). Second, although physical health has not always been considered an important predictor of offending (Banert et al., 2016), an emerging research base challenges this view. Stogner and Gibson's (2010) analysis of 6504 adolescents across 80 US high schools showed that those who had experienced health problems earlier in life were more likely to have offended during the prior year. Importantly, this study showed that the predictive effect of health on offending remained, even when controlling for demographic factors such as income, race, gender and age. Similarly, Thomas et al.'s (2015) study of 1325 adult prisoners in Queensland showed that health-related factors were important predictors of reincarceration. Therefore, there is a growing understanding that health and offending have a reciprocal relationship (Semenza et al., 2020).

### ***Understanding Health as a Predictor of Offending***

The relationship between social determinants of health and health outcomes is known to be mediated by other factors. For example, Braverman et al. (2011) describe how the effect of education on health is mediated by factors such as knowledge, income and social support. Similarly, it is thought that the effect of health on offending may be mediated by other predictors of offending. Link et al. (2019) examined three known predictors – family relationships, unemployment and financial problems – to explore their possible role as mediators between health and offending. They studied a cohort of 1532 adult males from 12 US states in the 15 months following release from prison, examining the health of the participants and their rate of reoffending in the study period. They also assessed the participants' family relationships, employment situations and financial problems. The study first confirmed a statistically significant association between health problems and reoffending. It was also able to demonstrate, through bootstrapping, that poor family relationships, unemployment and financial problems were mediating pathways for this association – that is, poor health led to problems in, for example, employment; and in turn, problems in employment led to reoffending.

Although understanding of this link is still developing, Jackson and Vaughn (2018) argue that there is sufficient evidence of the connection between poor health and later offending exists to justify policies aimed at addressing health inequality among young people.

### ***Programs to Reduce Offending by Improving Health***

Reducing youth reoffending is a major policy challenge in many countries, including Australia. Forty-one per cent of Australian young people aged 10–17 who were under youth justice supervision between 2000–01 and 2021–22 returned to sentenced supervision before the age of 18 (Australian Institute of Health and Welfare, 2021). Despite comprising just 3.2 per cent of the Australian population, Aboriginal and Torres Strait Islander young people make up 50 per cent of those in detention in Australia (Australian Institute of Health and Welfare, 2022). A major goal of youth justice departments is to develop programs to reduce the incidence of youth reoffending.

Programs that assist the mental health of people leaving the justice system have already been shown to reduce rates of reoffending (Gannon et al., 2019). Recent preliminary investigations into programs aimed at overall health have shown some promise. O'Connell et al.'s (2020) study of 400 probationers found that placing a "health navigator" in an urban probation office was associated with a rise in the proportion of individuals accessing care. Wang et al. (2019) considered the impact of providing access to a community health worker to 94 individuals who had just been released from prison, compared with a control group. They found that the group with the community health worker had lower rates of reincarceration for technical violations and spent shorter periods in correctional facilities.

### ***A Health Program in Queensland***

Under the *Navigate Your Health* program, delivered by Children's Health Queensland Hospital and Health Services, young people with high unmet health needs are allocated nurse navigators. The program was first developed in 2018 to provide health assessment, referrals and health coordination support to children subject to Child Safety orders in Queensland (Moss et al., 2021). In 2020, the program was expanded to include young people who had non-custodial Youth Justice orders – that is, people who are subject to community-based youth justice orders, such as probation orders. The program has been implemented for young people involved in the justice system in four Queensland locations: Brisbane, Logan, Ipswich and Cairns. This study focuses on the Youth Justice cohort of participants.

Healthcare navigators provide health assessments, healthcare referral coordination and prioritisation and coordination of services to address a patient's identified healthcare needs. They have been shown to improve a variety of health measures, including overall health outcomes, patient satisfaction, access to care and experiences of care (Carter et al., 2018; Freeman, 2013; McMurray & Cooper, 2017). Navigators are of particular benefit for patients with complex or chronic health conditions because those patients often have poor coordination with different healthcare providers and poor communication with those providers (Burgers et al. 2010). Navigators can improve patients' capacity for decision-making and self-management, which can lead to a positive impact beyond the period of contact with the nurse navigators (McMurray & Cooper, 2017). Nurse-led interventions in low socioeconomic and vulnerable populations have been shown to result in measurable improvements in health outcomes (Freeman, 2013; Olds et al., 1998), including for adult prisoners (Collett et al., 2022). The Nurse–Family Partnership provided nurses to low-income mothers who had experienced no previous live births (Olds et al., 1998). It led to improvements in parental care of children and in the maternal life-course, but also impacted the number of arrests and convictions in the adolescent children from those families (Olds et al., 1998).

Under the *Navigate Your Health* program, nurse navigators provide a full health assessment of the participant. This involves reviewing clinical records and collaborating with the patient and other stakeholders to identify the patient's health needs, the level of priority of these needs, required interventions to meet these needs, and timelines and responsibilities for those required interventions. Based on this assessment and collaboration, the nurse navigator then facilitates necessary appointments with appropriate providers and follows up with those providers as required. All healthcare offered is voluntary, so not all young people attended the appointments organised by the nurse navigators. The nurse navigators are registered nurses, who are required to have postgraduate qualifications and five years of direct clinical experience with children and young people. Māori and Pacific Islander participants and First Nations participants are matched with nurses from these backgrounds where possible. The overall goal of this program is to improve the health of the participants. An associated anticipated outcome contemplated by the program design is that by improving their health, the program will also lessen the risk of the participants reoffending.

### ***Current Study***

This article investigates whether participation in the *Navigate Your Health* program has led to changes in health. It also examines the effect of the program on six possible mediating factors between health and offending: housing (Bruce et al., 2014; Jusot et al., 2008; Visher et al., 2011), family relationships (Link et al., 2019), participation in learning (Case et al., 2005; Ford & Schroeder, 2010; Henry et al., 2012), engagement in employment (Link et al., 2019), cultural connectedness and connection to the community (Ferrario et al., 2001; Hansen, 2018; Magliano et al., 2005). To explore the relationship between poor health and involvement in the justice system that was identified by Link et al. (2019) and Jackson and Vaughn (2018), we also specifically examined the cohort of participants with poor initial well-being scores compared with other participants. Finally, we determined whether there was an overall reduction in the number of people with poor initial scores in all measured domains.

The research questions of this study were:

- Did the *Navigate Your Health* program lead to changes in participants' well-being and other key predictors of offending?
- How did changes in the cohort of participants with poor well-being at the beginning of the program compare with changes in other participants?
- Did the program lead to a reduction in the number of participants experiencing problems in well-being and other key predictors of offending and was that reduction statistically significant?

## Methods

### *Data Collection and Variables*

The Department of Children, Youth Justice and Multicultural Affairs maintained a database that contained demographic characteristics and program information for all young people referred to Navigate Your Health. At the point of referral, a case worker assessed the young person's well-being (encompassing overall physical and mental health), and the six domains identified as possible pathways between health and risk of offending: housing, cultural connectedness, family relationships, participation in learning, engagement in employment and connection to community. The case worker then reassessed those domains when the young person left the program. The same case worker conducted the initial assessment and the reassessment, unless this was not possible due to staff changes. Case workers were employed by the Department of Children, Youth Justice and Multicultural Affairs, a separate organisation from Children's Health Queensland Hospital and Health Services, which employed the nurse navigators. At each assessment, the case worker applied detailed criteria to determine the young person's position on a five-point Likert scale: (1) could do a lot better; (2) could do better; (3) okay; (4) doing well; and (5) doing great. Case workers used a guide that further characterised and gave illustrative examples for the different points on the Likert scale for each domain. For example, in the domain of family relationships, "(1) could do a lot better" was characterised as "unstable" and the illustrative examples given were "no supportive relationships within family; constant conflict; volatile relationships; identified domestic violence, abuse or neglect; no access to recreation activities as a family". The criteria of "(3) okay" was characterised as "some support", and illustrative examples were "relationships within family are okay at times; challenging or rebuilding relationships with family; some opportunities to access recreation activities as a family". The criteria of "5 doing great" was characterised as "stable and supportive", and illustrative examples were "good relationships within family, supportive network of extended family; participation in recreation activities as a family".

For the purposes of this study, data were provided by the Department of Children, Youth Justice and Multicultural Affairs. Ethics approval was provided by Queensland University of Technology Human Research Ethics Committee (approval number 2021-5124-6380, 15 December 2021). This research was also approved by the Youth Justice Governance Group on 2 November 2021. Written consent to participate in the program was obtained from the young person (when they were competent to do so) and from a parent or other person with legal authority in relation to the young person. This consent included permission to collect and use the information for the purpose of evaluation of the Navigate Your Health project and research.

### *Participants*

Data were collected pre- and post-program between 1 January 2020 and 20 September 2022. During this period, 178 participants were discharged from the Navigate Your Health program and therefore have before- and after-participation records. These 178 participants represent every young person with a non-custodial order at the study sites.

Table 1 shows the demographic breakdown of the participants in the program.

**Table 1**

#### *Cohort Summary*

<b>Cohort</b>	<b>Participants</b>	<b>Age M (SD)*</b>	<b>Female (%)</b>	<b>Male (%)</b>	<b>Time spent in program M (SD)</b>
Full cohort	178	15.41 (1.36)	25.3	74.7	189.33 (117.15)
Engaged cohort**	112	15.40 (1.42)	19.6	80.4	200.65 (98.43)

\* M = mean; S = standard deviation

\*\* Engagement is attending healthcare appointments organised by the nurse navigator.

As noted, attendance at healthcare appointments organised by the nurse navigators was voluntary. Of the 178 participants, 112 (62.9 per cent) engaged in the program by attending healthcare appointments organised by the nurse navigator (Table 1). To focus on the results of the provision of nurse navigation to young people subject to Youth Justice orders, the following results and analysis consider the 112 participants who engaged. Some measures were recorded as not applicable – for example, if a person was no longer attending school and was not seeking further education, the ‘participation in learning’ domain was not scored. These data were excluded from the analysis.

**Analysis**

First, a repeated measures ANOVA was employed to test whether the change in each domain was reliable. The ANOVA test is appropriate to test change in continuous outcomes.

In order to examine the impacts of the program on participants with poor health, domain scores were then dichotomised into poor (1 or 2) or okay/good (3, 4 or 5). Outcomes were examined separately for those with initial poor well-being status and those with initial okay/good well-being status. A repeated measures ANOVA was used to test whether the change in each group was reliable.

The proportion of participants who changed status between poor and okay/good in each domain was then examined. A McNemar test was employed to determine whether this change in status in each domain was reliable. The McNemar test is the appropriate chi-square test for change in the proportion of dichotomous outcomes when measures are repeated for the same participants (Adedokun and Burgess 2012).

**Results**

Figure 1 presents the results of the ANOVA test showing mean participant scores in each domain before and after participation in the program. Figure 2 presents the results of the ANOVA test showing whether the change in all domain outcomes for the initial-poor well-being group and initial-okay/good well-being group was reliable. Table 2 presents the results of the McNemar test showing whether the change in status between poor and okay/good scores in each domain was reliable.

**Figure 1**

*Comparison of Pre- and Post-Participation Scores*

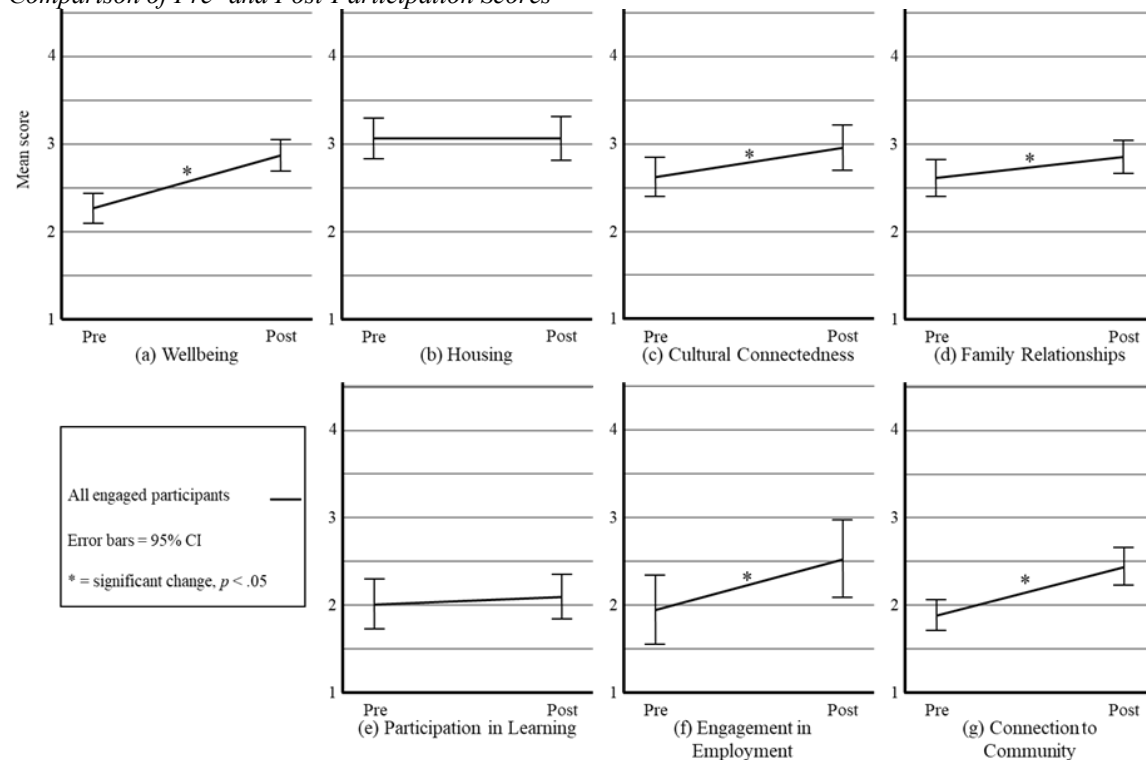


Figure 1 shows that participants had low scores in well-being and other domains at the beginning of the program. The mean initial well-being score was 2.29 (SD = 0.90) out of a maximum possible score of 5. Figure 1 also shows that program participation led to improvement in all domains except housing. The improvement reached statistical significance for well-being, cultural connectedness, family relationships, engagement in employment, and connection to community, but not in participation in learning.

**Figure 2**

*Comparison of Pre- and Post-Participation Scores: Participants with Poor Initial Well-Being vs Participants with Okay/Good Initial Well-Being*

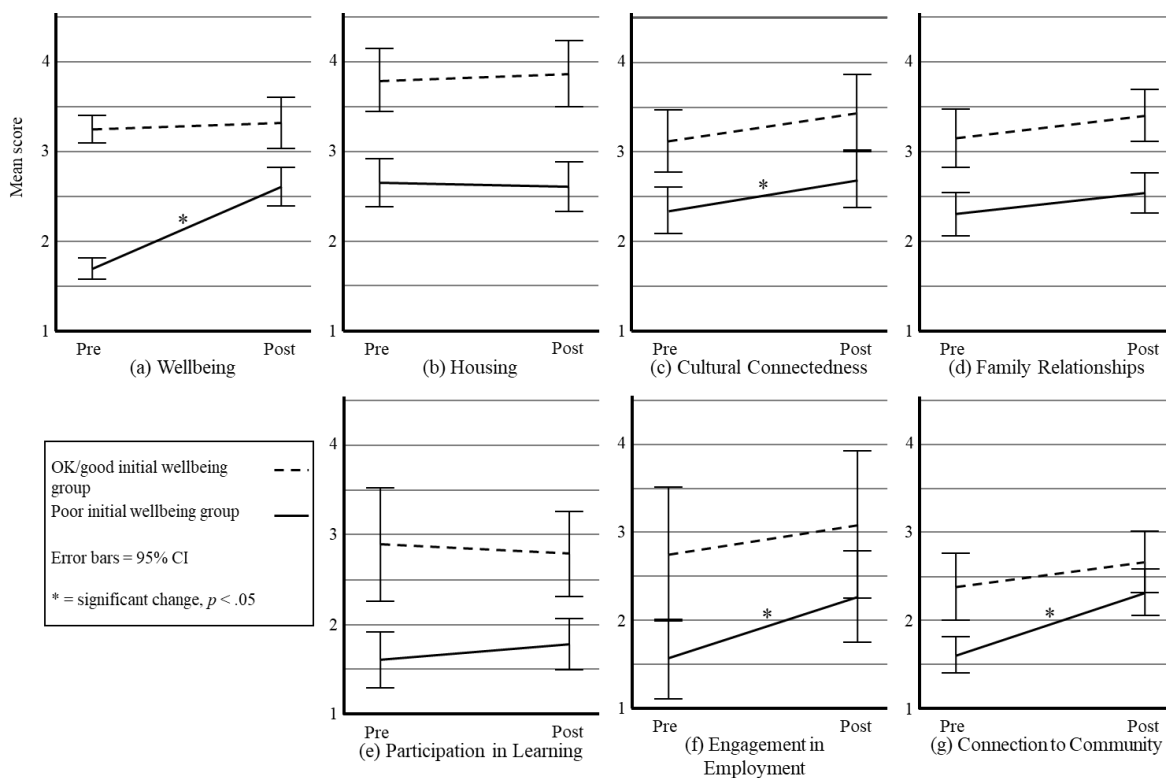


Figure 2 shows that, for most domains, the increases in mean scores for participants with poor initial well-being scores were similar to or greater than those for other participants. The improvements for the group with poor initial well-being reached statistical significance in well-being, cultural connectedness, engagement in employment, and connection to community. The largest improvement was for well-being, the mean score for people with poor initial well-being improved in that domain from 1.70 (SD = 0.46) to 2.61 (SD = 0.93).

For those with an initial well-being assessment of okay/good, there was an improvement in all domains except housing, which was steady. However, the improvement in well-being was not statistically significant. The improvement in family relationships did not reach statistical significance for either group, despite there being a statistically significant improvement in that domain for the cohort as a whole (see Figure 1). This reflects the lower numbers involved with the separated cohorts.

Table 2 shows that, following participation in the program, there was an increase in the proportion of participants with scores of okay/good in all measures and a decrease in participants with poor scores. The percentage of participants with okay/good scores in well-being improved from 37.3 per cent before the program to 64.5 per cent after. The changes in well-being and connection to community were significant ( $p < 0.01$ ). The low number in engagement in employment may be because many young people were not seeking employment, in which case that measure would be recorded as not applicable.

**Table 2***Comparison of Pre- and Post-Scores for Engaged Participants*

	<b>Outcome</b>	<b>Pre (%)</b>	<b>Post (%)</b>	<b>n</b>	<b><math>\chi^2</math></b>	<b><i>p</i></b>
<b>Well-being</b>	Okay/good	41 (37.3)	71 (64.5)	110	20.024	<.001
	Poor	69 (62.7)	39 (35.5)			
<b>Housing</b>	Okay/good	71 (65.1)	73 (67.0)	109	0.025	.875
	Poor	38 (34.9)	36 (33.0)			
<b>Cultural connectedness</b>	Okay/good	51 (56.0)	58 (63.7)	91	1.241	.265
	Poor	40 (44.0)	33 (36.3)			
<b>Family relationships</b>	Okay/good	62 (56.4)	71 (64.5)	110	1.362	.243
	Poor	48 (43.6)	39 (35.5)			
<b>Participation in learning</b>	Okay/good	26 (27.7)	32 (34.0)	94	0.962	.327
	Poor	68 (72.3)	62 (66.0)			
<b>Engagement in employment</b>	Okay/good	11 (28.9)	18 (47.4)	38	2.400	.118
	Poor	27 (71.1)	20 (52.6)			
<b>Connection to community</b>	Okay/good	22 (20.2)	49 (45.0)	109	16.488	<.001
	Poor	87 (79.8)	60 (55.0)			

## Discussion

The pre-participation levels across the domains shown in Figure 1 align with findings from other studies that young people who offend are a disadvantaged cohort (Rodriguez-Sánchez et al., 2018). In particular, these results confirm that young people who offend have high levels of health needs (Borschmann et al., 2020; Winkelman et al., 2017). The primary goal of the Navigate Your Health program is to improve the well-being of participants. Our results suggest that Navigate Your Health has achieved that goal and improved overall well-being outcomes for young people who engaged with the program. These results are consistent with the findings of other nurse navigator programs that have shown increased well-being outcomes for participants, including those with disadvantaged backgrounds (Freeman, 2013; Olds et al., 1998).

Improvements in well-being were accompanied by improvements in most of the other key predictors of reoffending measured in this study. This is an important result because, although these results were desired, it was not the core purpose of the nurse navigators to assist young people in these domains. Nurse navigators were able to work with the families to connect participants to healthcare, which may have contributed to assistance in the family relationships domain. In other domains, however, there was no assistance given. These results therefore indicate a potential cascading impact of improved health on known predictors of offending.

The results show improvement in all domains except for housing. It may be that improvements in housing would occur over a longer timeframe than the period of participation in the program; alternatively, it may be that this domain is not affected by improvements in the young people's health. This would be plausible, given that other socioeconomic factors not related to the youth's health can be assumed to determine housing status. This suggests that programs that specifically address housing problems for young people involved in the youth justice system will have particular ongoing importance.

As shown in Figure 2, the greatest improvement was in participants with poor initial well-being scores. They experienced statistically significant improvement in well-being outcomes and three other domains: cultural connectedness, engagement in employment and connection to community. The comparatively greater improvement in that group may partly reflect an

increased capacity for improvement via natural ceiling effects, especially regarding well-being. Nevertheless, the greater improvement in additional domains among this group supports the proposition that health is associated with, and may even be causally related to, these other areas (cultural connectedness, engagement in employment and connection to community). The strong improvement in those with poorer initial well-being is an encouraging outcome that warrants more sustained research.

Jackson and Vaughn (2018) argue that, to date, research into diminishing health inequalities and research into preventing crime have been inappropriately conducted in isolation, and there should be “greater alignment between health policy and criminal justice policy”, especially in relation to policies aimed at early prevention and intervention (p. 91). Our study adds weight to this argument for alignment of policy and expertise. It shows that programs directed at improving the health of people involved in the youth justice system are important, not only because this is a cohort with very poor health, but also because it may reduce the risk of reoffending.

### ***Limitations***

No control group was used in this study, so it does not have the benefit of a comparison group. This study also did not control for confounding demographic factors such as family income, socioeconomic status, gender, age or race, nor has it been able to assess reoffending rates; however, further research using ongoing data may be able to report such findings. The sample size of this study is restricted by the numbers involved in the program, which affects the statistical analysis that can be performed. As a result, interaction effects confirming that group differences in outcomes reached statistical significance were not tested. Although the effect sizes for each group are nevertheless of practical importance to inform decision-making (Graves et al., 2018), there would be benefit in carrying out further research to confirm and extend the present findings.

This study only examined well-being as a broad category. As indicated above, the connections between health and reoffending are likely to involve health-related factors, such as food, physical activity and sleep. Future research examining these factors would be beneficial.

### **Conclusions**

Further study of participants in this program, which incorporates reoffending data, will be able to indicate the effect of this program on that ultimate measure. However, by successfully lowering the number of problems in known predictors of offending, this study lends support to Jackson and Vaughn’s (2018) call for programs to reduce the risks of offending by intervening in the health of high-needs populations. In particular, it shows that assistance in healthcare may be an important part of a suite of measures aimed at reducing reoffending among young people who have been involved in the justice system.

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### **Ethics Approval**

This study received research ethics approval from QUT Office of Research Integrity, approval number 2021-5124-6380.

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