

## Chapter 5

# Relationships between hope and mental health among women in prison

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### Abstract

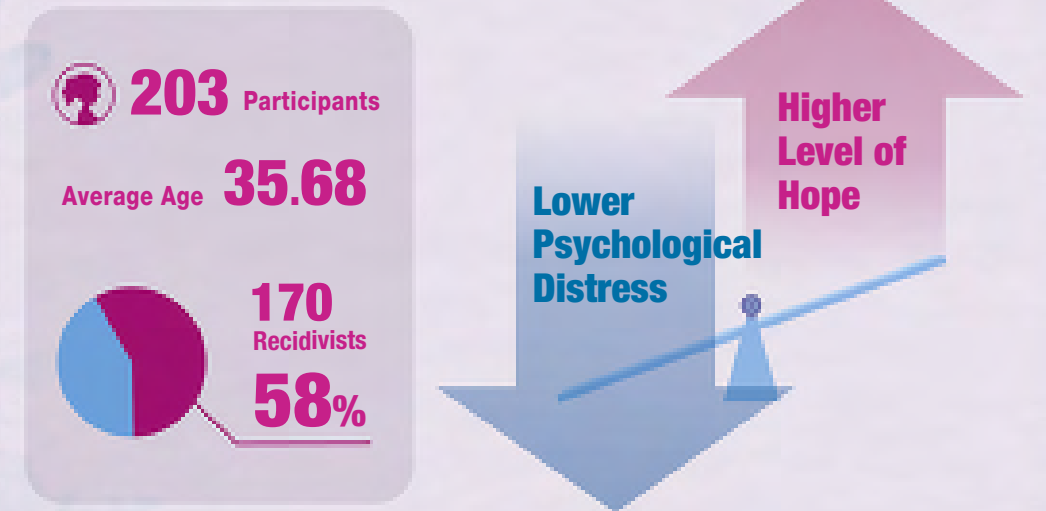
**Background:** Previous research with non-offenders has linked a higher dispositional cognition of hope to lower levels of psychological symptoms and demonstrated mediating effects of attentional biases on the relationship between hope and psychological symptoms, but this has not been explored among offenders.

**Aims:** Our aim was to investigate associations between a dispositional cognition of hope and habitual attentional processing styles and distress among women in prison. We hypothesised that higher levels of hope would be associated with more attention to positive information and less to negative information in the surroundings and, in turn, lower levels of depression, anxiety and stress symptoms in women in prison.

**Method:** In a cross-sectional study, we recruited consenting women serving a prison sentence who had been referred to psychological services. Participants completed a set of self-rating inventories individually, which scaled their levels of hope, attention to positive and negative information and symptoms of anxiety, stress and depression.



**Results:** Two hundred and three women participated. Their average age was 35.68 years (range 21–67 years). Over half were recidivists (170, 58%). Overall, the higher the level of hope they had, the lower were the ratings of their psychological symptoms. Positive attentional bias was associated with higher hope and lower psychological distress. In contrast, negative attentional bias was related to lower hope and higher psychological distress ratings. In statistical models, both attentional biases appeared to be partial mediators of the relationship between hope and psychological distress.



**Conclusions:** Our findings among women in prison were consistent with those in non-forensic populations and not previously studied among prisoners. They suggest that it would be worth evaluating interventions to modify attentional styles as they may have value in increasing hope and reducing psychological symptoms and perhaps also harmful behaviours in this vulnerable population.



## INTRODUCTION

Incarceration is typically a traumatic experience (Elisha, Idisis, & Ronel, 2012; Levenson & Willis, 2019). Qualities of the environment which may contribute to this include restrictions on movement, presence of authority figures, overcrowded environment, limited privacy and hyper-vigilance because of security concerns, potentially increasing the risk of trauma-related symptoms and hopelessness (Miller & Najavits, 2012).

Sykes (1958) summarised five categories of prison stress—deprivations of: (1) goods and services; (2) liberty; (3) heterosexual relationships; (4) autonomy and (5) security. He described these deprivations as constituting ‘pain of imprisonment’. Among them, the most frequently reported adjustment difficulty is the separation from family and friends (Zamble & Porporino, 1988). It has also been reported that female offenders are more likely to suffer from mental health problems than their male counterparts (James & Glaze, 2006). Depression, anxiety and self-harming behaviours are more prevalent among female than among male offenders (Bloom et al., 2003). Studies on women in prison indicate that they have different psychological needs from men, relating partly to their disproportionate history of emotional, physical and sexual traumas, and partly from their child-rearing re-sponsibilities (LeClair, 1990). Furthermore, the rate of suicide among female offenders is greater than among demographically comparable groups in the community, suggesting that typical incarceration experiences may not only trigger pre-existing tendencies, but also increase the use of self-destructive solutions to one's problems (McDermott, 1991). Thus, there is a need to determine corresponding protective and risk factors for women in prison in relation to the psychological stresses that they experience.

## Dispositional cognition of hope

Hope is a positive cognition that consists of three components: (1) goals; (2) pathway thinking that includes plausible routes to achieve goals and (3) agency thinking, which provides motivation to meet goals (Snyder et al., 1991). Snyder's (2002) hope model states that human actions are goal-directed in which people initiate and sustain actions to reach and obtain their goals.

Martin and Stermac (2010) found that individuals in correctional settings who have lower levels of hope are at greater risk for becoming involved in further offending behaviours. They conceptualised offending as choosing inappropriate pathways and having a lower sense of agency for desired outcomes. As such, hope could act as a protective construct that reduces risk of further offending. It may facilitate increased access to opportunities and support, thus allowing offenders working towards their positive goals (Moulden & Marshall, 2005). Evidence from cancer patients and physically disabled individuals also suggests that people with a more hopeful cognitive state are more likely to be resilient and less likely to be depressed or anxious (Elliott et al., 1991; Ho et al., 2010; Yuen et al., 2014). Furthermore, hopeful individuals tend to address stressful situations more actively and used fewer disengaging coping strategies, such as social withdrawal or problem avoidance (Chang, 1998).

Chang and DeSimone (2001) examined the relationship between dispositional hope and depression in greater detail via a mediational path model, and found that levels of hope had both direct and indirect effects on severity of depressive symptoms. Thus, a question arises about what additional variables may mediate between hope and distress. A candidate is attentional bias—the habitual tendency to pay attention to positive or negative stimuli in the environment (MacLeod, Mathews & Tata, 1986; MacLeod & McLaughlin, 1995).



## Attentional bias

According to mood congruence theory proposed by Macleod and his colleagues (MacLeod et al., 1986; MacLeod & McLaughlin, 1995), individuals tend to give greater cognitive weight or processing priorities to information that is consistent with their ongoing mood states. It is widely accepted that both clinically and non-clinically anxious individuals selectively attend to threat-related information in their environments (Bar-Haim et al., 2007). Similarly, depressed individuals often discharge highly dysfunctional attitudes or beliefs about themselves, which control their information processing and attention, in turn perhaps increasing negative emotions (Garland et al., 2010).

There is evidence that negative attentional bias towards threats and aggression is associated with a higher risk of offending behaviour (Brugman et al., 2016; Domes et al., 2013). Brugman et al. (2016), for example, conducted a study among 69 male offender-patients and reported that subjects with higher negative attentional bias towards threats and aggression and lower positive attentional bias for recognition of happy faces were more likely to exhibit verbal aggressive behaviours. Hence, reduction of negative attentional bias may provide a means for reducing psychological distress (Browning et al., 2012). Fewer studies have been conducted on positive attentional bias (Lau & Waters, 2017). Based on the broaden-and-build model, Wadlinger and Isaacowitz (2011) proposed that positive affect increased individuals' selective attention preferences towards positive information, and this 'protective bias' underlies an individual's ability to keep positive information active, thereby enabling individuals to enjoy better psychological well-being and experience less anxiety and depression (Levens & Gotlib, 2010).

In non-offender populations, cognitive processing styles, such as attention, have been shown to mediate the relationship between dispositional hope and psychological symptoms, including depression and anxiety (Chan et al., 2011; Yuen et al., 2014). A higher level of hope was linked to more adaptive habitual attentional bias and, in turn, fewer psychological symptoms (Lau & Waters, 2017). In a recent study with adolescents (Yeung et al., 2015), it was found that attention to positive information partially mediated the beneficial relationships of hope to subjective happiness, anxiety and depression and interpersonal difficulties. To the best of our knowledge, the potential mediational role of attentional bias on the relationship between hope and psychological distress has not previously been examined among offenders.

Our aim, therefore, was to investigate relationships between the dispositional cognition of hope and habitual attentional processing styles and psychological distress among women in prison. Specifically, our questions were:

- (1) What is the relationship between dispositional hope and psychological distress among women in prison in Hong Kong and
- (2) does attentional bias act as a mediator on any such relationship?

In this study, 'psychological distress' will be operationalised as the sum of depression, anxiety and stress symptoms reported and 'hope' as the sum of agency thinking and pathway thinking reported. It was hypothesised that female offenders with higher levels of hope would habitually pay more attention to positive information and less attention to negative information in their surroundings which would, in turn, relate to less depression, anxiety and stress symptoms.

## METHODS

Ethics approval was obtained from Hong Kong Correctional Services.

### Participants and procedures

Female prisoners were recruited from Lo Wu Correctional Institution (LWCI), which houses the majority of female offenders in Hong Kong. All participants were referred by staff to the psychological unit in LWCI. There were various reasons for referrals such as interpersonal conflicts, emotional problems, adjustment issues and so on. They were all invited to participate in the study with exclusion criteria to exclude those who were illiterate, having serious behavioural disturbance and in active psychotic states. All the women had given informed consent in writing. Participants were asked to complete a psychometric test battery, consisting of a number of self-report measures and a demographic questionnaire. These were administered individually by psychological staff who were prison-employed assistants to clinical psychologists. These staff were equipped with psychological knowledge and were trained in delivering these schedules by clinical psychologists.

## Measures

**The Chinese version of the Adult Hope Scale** (Ho et al., 2010) was used to assess level of dispositional hope (Snyder et al., 1991). The 12-item self-report scale consists of four agency and four pathway items mixed with four filler items. Each participant was asked to rate the extent to which each item described her currently on an 8-point Likert scale (from 1 definitely false to 8 definitely true). The agency and pathway scores were obtained by summing the corresponding subscale items. A total hope score (hope total: range 1–64) was computed by adding together the agency and pathway scores to indicate overall dispositional hope. Higher scores indicate higher levels of dispositional hope. The internal consistencies (Cronbach's alpha) were agency 0.70, pathway 0.76 and hope total 0.81 in this study.

**The Chinese 8-item short form of the Attention to Positive and Negative Information Scale** (Chan et al., 2011) was used to measure cognitive tendencies to focus on positive and negative information (Noguchi et al., 2006). The two subscales, Attention to Positive Information subscale (API), and Attention to Negative Information subscale (ANI), measure participants' attentional bias to positive and negative information respectively. Each item is rated on a 5-point Likert scale, ranging from 1 (very untrue of me) to 5 (very true of me). Higher scores imply stronger tendencies to concentrate on corresponding positive or negative information. In this study good internal consistencies were found (API  $\alpha$  0.77; ANI  $\alpha$  0.71).

**The Chinese version of the Depression Anxiety Stress Scales** (DASS-21) was used to measure psychological distress (Lovibond & Lovibond, 1995). It contains three subscales—depression, anxiety and stress—with 7 items per subscale (Antony et al., 1998; Henry & Crawford, 2005). On a 4-point Likert scale (from 0 'did not apply to me at all' to 3 'apply to me very much or most of the time'), participants rated how frequently the statement applied to them within the last 7 days. A total DASS score was computed to indicate overall psychological distress (total score range: 0–42). The internal consistency of each subscale and the overall scale in this study were high (depression  $\alpha$  0.88, anxiety  $\alpha$  0.85, stress  $\alpha$  0.85, DASS total  $\alpha$  0.94).

## Analytic plan

Descriptive statistics were provided to give a picture of the sample. Independent samples t-tests and Pearson's correlation analyses were conducted to examine relationships between demographic variables and psychological measures. SPSS PROCESS macro was used in mediation analyses (Hayes, 2013) of the proposed model, with Hope Total as the independent variable, DASS Total as the dependent variable and positive and negative attentional biases as mediators. The procedure has recently been recommended for testing mediation as it provides higher statistical power than the causal steps approach (Baron & Kenny, 1986).

## RESULTS

### Description of the sample

The mean age of the 203 participating women was 35.7 years (standard deviation [SD] 9.8, range 21–67). The mean length of sentence was just over 54 months (M 54.34, SD 45.80; range 1–240 months). Other details, including educational level and type of offence are shown in Table 1. One hundred and seventeen (58%) of the women had had prior prison terms. Among 96 (47%) participants who reported a history of psychiatric service use before this imprisonment, 66 (32.5%) had received a formal psychiatric diagnosis from psychiatrists, including depression and anxiety disorder.

Table 2 presents the mean and standard deviation of each psychological variable by whether participants had received formal psychiatric diagnoses. Independent sample t-test analyses showed that, as a group, participants with psychiatric diagnoses reported lower positive attentional bias ( $t(201) = 2.07, p = 0.04$ , Cohen's  $d = 0.31$ ) and higher total psychological distress levels ( $t(201) = -2.30, p = 0.02, d = 0.34$ ). There were no significant differences in diagnoses between women in prison who were incarcerated for the first time and those who were incarcerated repeatedly.

### Correlations with dispositional hope

Table 3 shows the correlation matrix of reported hope, dispositional bias and mental state variables with age, education and sentence severity. Pearson's product moment analyses showed that age was positively correlated with dispositional total hope score ( $r = 0.18, p = 0.01$ ), although at a low level. Similarly, there were small but significant correlations between total hope score and positive attentional bias ( $r = 0.19, p = 0.01$ ) and, negatively, with attentional bias towards negative information ( $r = -0.27, p < 0.001$ ) scores. In other words, older female prisoners tended to have higher levels of hope, more positive attentional bias and less negative attentional bias. Statistically significant correlations were found between dispositional hope and all psychological variables in the expected directions. In summary, higher levels of hope were associated with less psychological distress, less negative attentional bias and more positive attentional bias. Finally, a strong positive relationship was also found between negative attentional bias and psychological distress ( $r = 0.55, p < 0.001$ ) and a similarly strong inverse relationship between positive attentional bias and psychological distress ( $r = -0.47, p < 0.001$ ).

Table 1

**Socio-demographic characteristics of participant women in prison in Hong Kong**

	N	%
<b>Education level</b>		
Kindergarten or below	1	0.5
Primary school	20	9.9
Secondary school	164	80.8
University	11	5.4
Postgraduates or above	3	1.5
Others	4	2.0
<b>Employment</b>		
Full time employment	52	25.6
Part-time employment	15	7.4
Unemployed	66	32.5
Incapacity to work	3	1.5
Homemaker or fulltime student	32	15.8
Retired	5	2.5
Illicit business	29	14.3
<b>Previous psychiatric/psychological services<sup>a</sup></b>	97	47.8
<b>Previous psychiatric diagnoses<sup>b</sup></b>	66	32.5
<b>Previous psychiatric medications<sup>a</sup></b>	83	40.9
<b>Previous conviction(s)<sup>a</sup></b>	117	57.6
<b>Type of primary index offence</b>		
Blackmail	2	1.0
Conspiracy to defraud	13	6.4
Deal proceed if indictable offence	3	1.5
Drug-related (e.g., possession, trafficking)	115	56.7
Fraud, induce others to commit	7	3.4
Manslaughter	2	1.0
Obtain property/service by deception	4	2.0
Robbery	2	1.0
Sexual offences	3	1.5
Theft	28	13.8
Untaxed goods	2	1.0
Use forged travel documents/instruments/statutory declarations/	3	1.5
Used ID relating to others	2	1.0
Violence-related (e.g., wounding, assault causing actual bodily harm)	3	1.5
Others	12	5.9

Note: N = 203. Participants were on average 35.7 years old (SD = 9.8) with average sentence of 54.3 months (SD = 45.8).

<sup>a</sup> Reflects the number and percentage of participants answering 'yes' to this question.

<sup>b</sup> Reflects the number and percentage of participants among those who had previous psychiatric/psychological services (n = 97) answering 'yes' to this question.

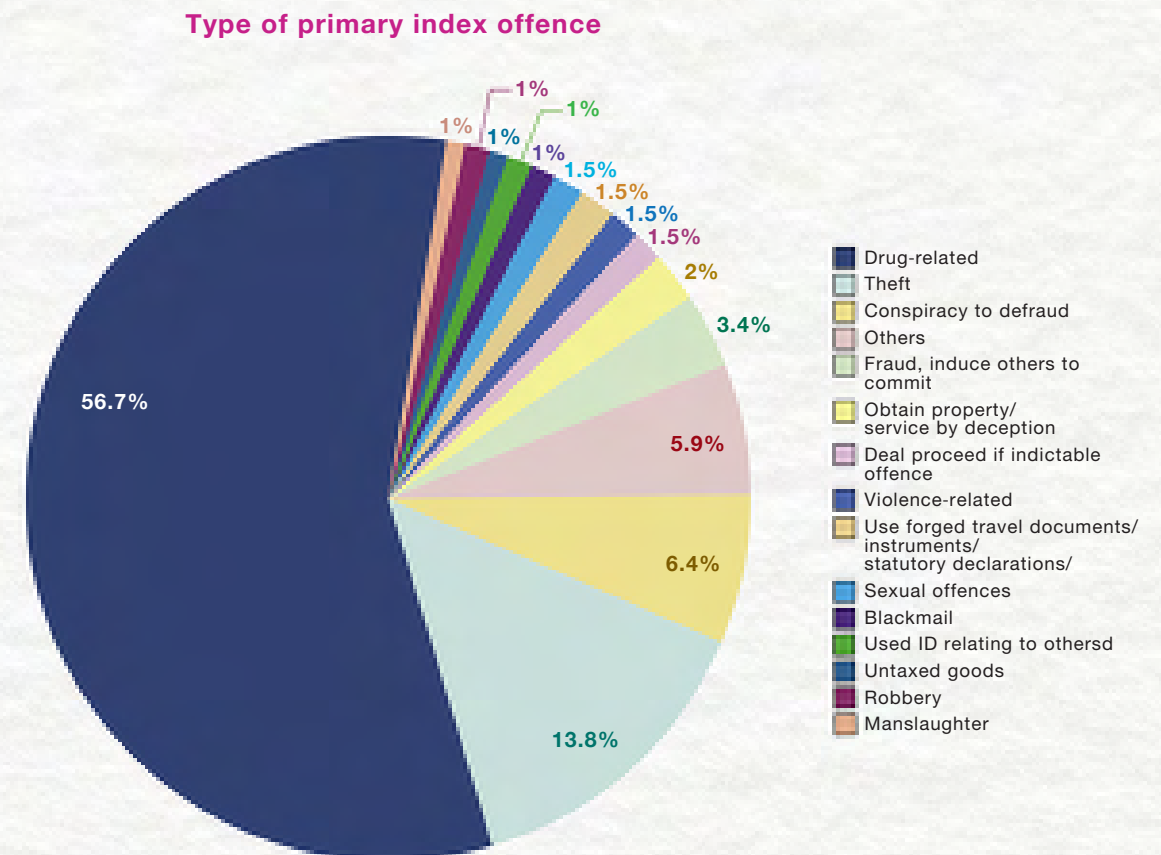
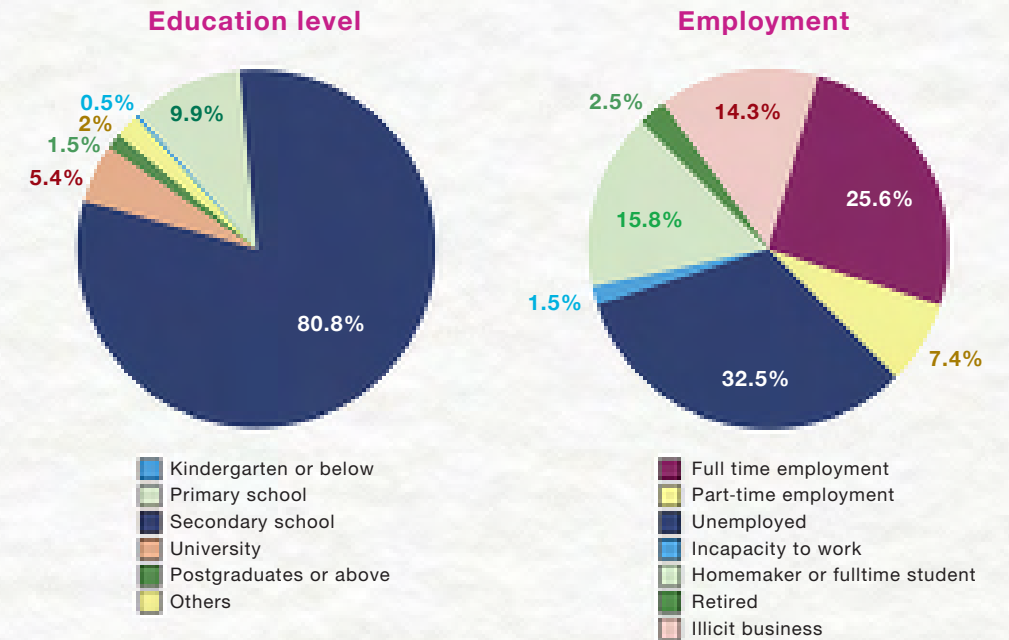


Table 2

**Relationships among measures of hope, attentional biases and psychiatric diagnoses**

	Yes (N = 66)		No (N = 137)		t value
	Mean	SD	Mean	SD	
<b>AHS</b>					
Agency	16.12	6.62	17.28	6.99	1.12
Pathway	17.65	6.69	18.69	7.37	0.97
Hope Total	33.77	12.23	35.97	13.60	1.11
<b>APNIS</b>					
API	13.17	3.18	14.13	3.09	2.07*
ANI	15.79	3.64	15.38	3.39	-0.78
<b>DASS</b>					
Depression	17.52	11.52	14.12	10.38	-2.11*
Anxiety	17.61	10.87	13.27	8.85	-3.03*
Stress	21.21	10.40	19.42	10.13	-1.17
DASS Total	56.33	29.58	46.80	26.72	-2.30*

Notes: Hope Total = Total score of the Adult Hope Scale; API = Positive Attentional Bias subscale score of the Attention to Positive and Negative Information Scale; ANI = Negative Attentional Bias subscale score of the Attention to Positive and Negative Information Scale; DASS Total = Total score of the Depression Anxiety Stress Scales.

Abbreviations: AHS, Adult Hope Scale; APNIS Attention to Positive and Negative Information; DASS, Depression Anxiety Stress Scales.

\*p < 0.05.

**Further analysis of interactions between variables associated with psychological distress**

Taking psychological distress as the dependent variable, PROCESS macro (Hayes, 2013) was used to test how the variables found to be significantly related at the binary level interacted. Hope was taken as an independent variable, positive and negative attentional biases as possible mediators while age and psychiatric diagnoses were entered as covariates. A series of simple regression analyses were performed to establish zero-order relationships between these variables. First, a significant relationship between psychological distress and dispositional hope was confirmed ( $\beta = -0.70$ , 95% CI [-0.99, -0.40] SE = 0.15,  $t = -4.62$ ,  $p < 0.001$ ). Next, significant associations were also confirmed between dispositional hope and positive attentional bias ( $\beta = 0.14$  95% CI [0.11, 0.17], SE = 0.01,  $t = 10.52$ ,  $p < 0.001$ ), and between dispositional hope and negative attentional bias ( $\beta = -0.12$ , 95% CI [-0.15, -0.09] SE = 0.02,  $t = -7.42$ ,  $p < 0.001$ ). Subsequent simple regression analyses further confirmed significant associations between psychological distress and positive attentional bias ( $\beta = -1.60$ , 95% CI [-2.75, -0.46] SE = 0.58,  $t = -2.76$ ,  $p = 0.01$ ) and between psychological distress and negative attentional bias ( $\beta = 3.01$ , CI [2.06, 3.96] SE = 0.48,  $t = 6.25$ ,  $p < 0.001$ ; Table 4).

When positive and negative attentional biases were input as mediators in multiple regression analyses, the relationship between dispositional hope and psychological distress decreased in strength but was still significant in both the former case (API:  $\beta = -0.23$ , 95% CI [-0.41, -0.07] SE = 0.09) and the latter case ( $\beta = -0.36$ , 95% CI [-0.56, -0.21] SE = 0.09). These results suggested that attentional biases partially mediated the relationship between dispositional hope and psychological distress (Figure 1).



Table 3

Correlation Matrix between demographic and psychological variables describing women in prison in Hong Kong

Variables	1	2	3	4	5	6	7
1. Age	-	-	-	-	-	-	-
2. Education	-0.27***	-	-	-	-	-	-
3. Months of sentence	-0.13	-0.17*	-	-	-	-	-
4. Hope total	0.18**	-0.05	-0.06	-	-	-	-
5. API	0.19**	-0.90	0.04	0.62***	-	-	-
6. ANI	-0.27***	0.00	0.03	-0.49***	-0.27***	-	-
7. DASS total	-0.07	0.08	-0.03	-0.61***	-0.47***	0.55***	-

Notes:

(1) Hope Total = Total score of the Adult Hope Scale; API score of the Attention to Positive and Negative Information Scale; ANI score of the Attention to Positive and Negative Information Scale; DASS Total = Total score of the Depression Anxiety Stress Scales.

(2) Subscale scores of the Adult Hope Scale and the Depression Anxiety Stress Scales are not included since only their total scores were included in the mediation analyses.

Abbreviations: API, Positive Attentional Bias subscale; ANI, Negative Attentional Bias subscale; DASS, Depression Anxiety Stress Scales.

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.



Table 4

Outcome of multiple regression analysis testing for direct effect and mediation effects

	Direct effect on DASS Total			Mediation effect: Hope on DASS total		
	β	SE	95% CI	β	SE	95% CI
HS total	-0.70***	0.15	[-0.99, -0.40]	-	-	-
API	-1.60**	0.58	[-2.75, -0.46]	-0.23**	0.09	[-0.41, -0.07]
ANI	3.01***	0.48	[2.05, 3.96]	-0.36***	0.09	[-0.56, -0.21]
$R^2 = 0.50, F(5,197) = 38.74, p < 0.001$						

Notes:

Hope Total = Total score of the Adult Hope Scale;

API score of the Attention to Positive and Negative Information Scale; ANI score of the Attention to Positive and Negative Information Scale; DASS Total = Total score of the Depression Anxiety Stress Scales.

Abbreviations: API, Positive Attentional Bias subscale; ANI, Negative Attentional Bias subscale; DASS, Depression Anxiety Stress Scales.

\*\*p < 0.01, \*\*\*p < 0.001.

## DISCUSSION

Consistent with our hypothesis, among women in prison, higher levels of hope were associated with lower levels of symptoms of depression. This is consistent with previous research among other populations (Elliott et al., 1991; Ho et al., 2010; Yuen et al., 2014) and suggests that the dispositional cognition of hope might have the potential to act as a protective factor against psychological distress in women in prison. Imprisonment is a stressful and frustrating experience, perhaps especially for women, that is likely to increase a sense of unpredictability of the future (Kraemer et al., 2009). As women in prison are vulnerable to self-harm and suicide, in turn commonly associated with negative mood states, new strategies are required that are specifically designed for them. As described by Van Wormer (2010), one of the innovative and gender-sensitive approaches is art therapy, helping women in prison to voice their trauma and to empower them through self-expression. Mak et al., (2016) have introduced a pioneer approach of combining cognitive-behavioural therapy and positive psychological intervention for reducing psychological distress and enhancing psychological well-being for women in prison. In their work, interventions to increase hope and positive mindfulness for improving attentional bias were incorporated. Riley et al. (2019) showed that the mindfulness and acceptance-based group therapy helped improving mindfulness and acceptance, and reduced depression, anxiety and somatoform symptoms among women in prison. While many other studies focused mainly on interventions for female adolescents or female substance users in prison (e.g., Roberts-Lewis et al., 2010), evidence-based treatment programmes for adult women in prison without substance misuse histories were insufficient. More effort to develop programmes specifically for women in prison is needed.

It was apparent in our study that some women were nevertheless able to retain hope for the future and that this was associated with less depression or anxiety, so one question which follows is whether it may be possible to cultivate a dispositional cognition of hope even within prison. Sustaining hope and perhaps a more positive mood state is increasingly important in Hong Kong, where the number of women admitted into penal institutions has increased from 944 in 1986 to 3,484 in 2015; this compares with a decrease from 9718–7998 over the same period for their male counterparts (Hong Kong Census and Statistics Department, 2016).

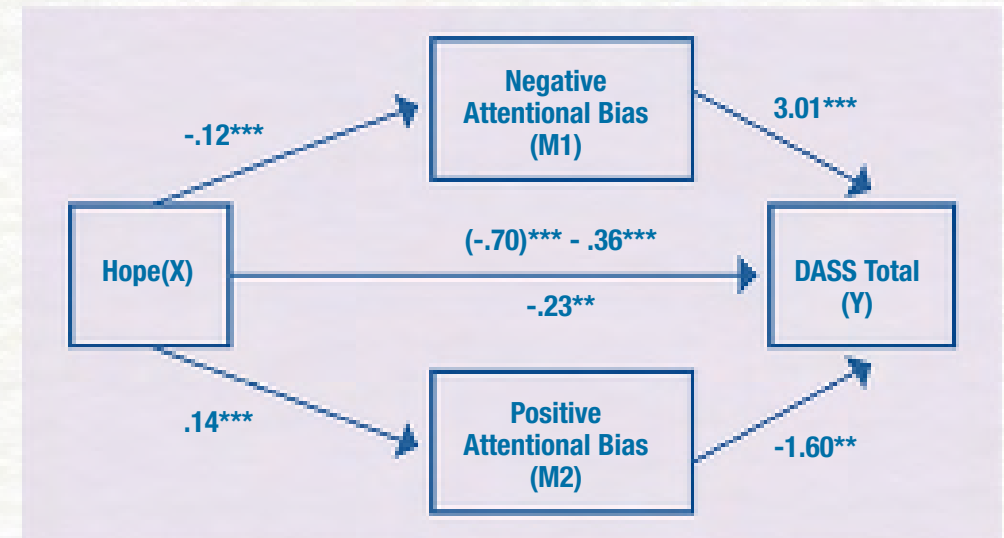


FIGURE 1

Mediation model of negative and positive attentional biases on the relationship between Hope Total and DASS Total. Values presented are unstandardized regression coefficients. Baseline coefficients was represented in parenthesis.

\*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

Our results also showed that the relationship between hope and psychological distress was partially mediated by attentional biases to negative and positive information. The mediation effects of negative and positive attentional biases between hope and psychological distress extend current knowledge by further elaborating the underlying mechanisms of dispositional hope in preventing psychological distress. In other words, **hopeful thinking may shape attention away from negativity and towards positivity, in turn limiting negative affective states.** Higher levels of dispositional hope indicated more goal-directed thinking, encouraging pursuit of goals. Evidence-based hope interventions have been developed for other populations, such as people facing genetic colon cancer screening (Ho et al., 2012). Our results provide theoretical support for developing similar interventions to increase levels of hope among women in prison, in part in the hope of reducing their psychological distress.



Furthermore, in providing evidence that **the more negative the attentional bias is associated, the greater is the psychological distress, and, conversely, the more positive the attentional bias is associated, the lower is the psychological distress reported**, our findings suggest the likelihood of downward spirals of negativity and upward spirals of positivity found in previous studies with other groups of people (Disner et al., 2011; Garland et al., 2010; Kellough et al., 2008). Through biased cognitive processes of emotionally salient information, a self-perpetuating and vicious cycle of negative emotions is maintained, or the converse. Through cognitive processes such as broadening attention and positive reappraisal, it may be possible to break this and trigger a virtuous circle of positive emotions and decreased stress is maintained. Thus, apart from interventions targeting increasing dispositional hope, interventions which help to decrease negative attentional bias and increase positive attentional bias may be beneficial for female offenders (Bar-Haim, 2010). **Clinicians in women's prisons may consider hope interventions, as well as attentional bias training.**

Although other sample characteristic analyses were not the main purpose of this study, identification of demographic risk factors may help clinical psychologists screen offenders who are at higher risk of psychological distress and tailor interventions. Briefly, several demographic and criminogenic factors were found to be related to psychological distress in our sample of women in prison. Significant correlations were identified between age and dispositional hope as well as attentional biases. One plausible explanation is that younger prisoners have not yet developed an ability to cope mentally with and adjust to the sense of confinement in prison and related experiences. A study with young women in South Africa showed that hope is also significantly correlated with school grade, alcohol use and family support variables (Abler et al., 2017). Their findings showed that young females with higher school grades, less alcohol use and more family support attain higher levels of hope. Although it may be premature to generalise these findings to an offender population, they shed light on other variables to be considered. To identify more risk and protective factors during the screening stage for women in prison is worth considering. Early identification of individuals who feel little hope, followed by relevant intervention, could be life-saving.

## Limitations

Our study has several limitations. The main one is that it was cross-sectional, so although we may infer pathways from our statistical analyses, we cannot attribute cause and effect. Nevertheless, there is now strong evidence that this is a model worthy of further testing by longitudinal and intervention studies. The possibility of attentional biases as moderating variables may be worth exploring more fully. Second, we investigated only sentenced women in prison, so questions about any relationships between hope, attentional biases and mental state remain about women awaiting trial in prison, women in the criminal justice system who are not imprisoned and all male offenders. It seems likely that the model would hold for these other groups as it holds in situations where chronic stress is of an entirely different kind—like living with cancer, but more circumstance-specific research is needed. Thirdly, our sample included only women who had been referred to psychological services, thus perhaps biased towards distress and negative attentional styles. More could be learned by a more fully representative sample with respect to mental state.

## Clinical implications

Hope interventions, which provide skills in goal setting, finding ways and taking steps to achieve goals while maintaining motivation, and attentional training—to increase awareness of positives in the environment, could be developed to assist women in prison in managing their negative ruminations and worries about the challenges and difficulties they face. In doing so, anxiety and depression may be reduced to an extent that would improve the safety of this very vulnerable group who have exceptionally high self-harm rates in prison.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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