**Title page**

# The perceived risks and benefits of quitting in smokers diagnosed with severe mental illness participating in a smoking cessation intervention: Gender differences and comparison to smokers without mental illness.

**Running title:** Perceptions of quitting smoking in psychosis

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**Abstract**

**Introduction and Aims.** This study aimed to examine the perceived risks and benefits of quitting in smokers diagnosed with psychosis, including potential gender differences and comparisons to smokers in the general population. **Design and Methods.** Data was collected from 200 people diagnosed with psychosis participating in a randomised controlled trial testing the effectiveness of a multi-component intervention for smoking cessation and cardiovascular disease risk reduction in people with severe mental illness. Results were compared to both treatment and non-treatment seeking smokers in the general population. **Results.** Male and female smokers with psychosis generally had similar perceived risks and benefits of quitting. Females rated it significantly more likely that they would experience weight gain and negative affect upon quitting than males diagnosed with psychosis. Compared to smokers in the general population also seeking smoking cessation treatment, this sample of smokers with psychosis demonstrated fewer gender differences and lower ratings of perceived risks and benefits of quitting. The pattern of risk and benefit ratings in smokers diagnosed with psychosis were similar to those of non-treatment seeking smokers in the general population. **Discussion and Conclusions.** These results increase our understanding of smoking in people with severe mental illness, and can directly inform smoking interventions to maximise successful abstinence for this group of smokers. For female smokers with psychosis, smoking cessation interventions need to address concerns regarding weight gain and negative affect. Intervention strategies aimed at enhancing beliefs about the benefits of quitting smoking for both male and female smokers with psychosis are necessary.

**Keywords:** = smoking; smoking cessation; severe mental illness; perceived risks and benefits; gender differences

*Abstract word count: 250* *Main text word count* = 3507

**Introduction**

Worldwide, the prevalence of tobacco smoking and the resultant impact on the health, well-being and lifespan of people who experience severe mental illness, such as schizophrenia and bipolar affective disorder, is significantly disproportionate to smokers in the general population. For example, in Australia, 15.1% of the general population smokes daily [1], while recent smoking rates for Australians diagnosed with psychosis are 66.6% [2]. Smokers who experience severe mental illness are more likely to die from smoking related conditions, predominantly cardiovascular disease (CVD), than from the mental illness per se [3, 4]. Further, smokers with severe mental illness die at significantly greater rates and much younger ages than people without mental illness [5, 6]. Quitting smoking will not only improve the health of people experiencing severe mental illness, it will also have important benefits on their financial situation, clinical presentation and overall quality of life.

Smokers experiencing severe mental illness want to quit [7], but find it harder, and have less success overall compared to smokers in the general population [8, 9]. We wanted to explore the beliefs that smokers diagnosed with psychosis have about the risks (e.g. craving) and benefits (e.g. improved health) of quitting smoking, research that had not previously been conducted in this population. Knowing what smokers with severe mental illness consider to be the risks and benefits of stopping smoking would enable us to further tailor smoking cessation interventions to hopefully improve the chance of successful abstinence for this group of typically challenging to treat smokers.

McKee *et al.* developed the Perceived Risks and Benefits Questionnaire (PRBQ) to assess smokers beliefs about quitting [10]. Research using the PRBQ has examined gender differences and the overall pattern of responses in people without mental illness seeking

smoking cessation treatment [10, 11] and in non-treatment seekers [12]. McKee *et al.* found female smokers seeking treatment anticipated significantly more risks (weight gain; increased negative affect; social ostracism; and decreased concentration) associated with smoking cessation than males [10]. This gender difference was replicated by Toll *et al.* who found female smokers had significantly higher perceived risk scores (increased weight and negative affect and reduced enjoyment) than males [11]. McKee *et al.* further found female smokers rated numerous benefits of quitting smoking significantly higher than males (improved health, well-being, self-esteem, finances, physical appeal and social approval) [10]. In the general population of smokers not seeking assistance with quitting, these gender differences were almost absent. Males and females in this group had similar perceived risks and benefits of quitting, except for weight gain risks, where females had significantly higher beliefs about this occurring than males [12]. Overall, the non-treatment seeking smokers in the general population had lower ratings of perceived risks and benefits of quitting compared to the treatment seeking sample in the McKee *et al.* study [10].

The current study is the first to explore the perceived risks and benefits of quitting in smokers with severe mental illness. Using data from a large randomised controlled trial (RCT) testing the effectiveness of a multi-component intervention for smoking cessation and CVD risk reduction in people diagnosed with psychosis [13, 14] we aimed to:

- Examine the perceived risks and benefits of quitting in smokers diagnosed with psychosis presenting for treatment in a smoking intervention study
- Explore potential gender differences in the perceived risks and benefits of quitting
- Compare the pattern of risks and benefits of quitting in smokers with psychosis to smokers in the general population

## Method

### *Sample*

A total of 236 smokers were recruited from Melbourne, Victoria and Sydney and Newcastle, New South Wales, Australia, to participate in a RCT testing the effectiveness of a multi-component intervention for smoking cessation and CVD risk reduction among people with psychosis [13, 14]. The RCT followed CONSORT guidelines. The inclusion criteria were: aged ≥ 18 years; diagnosis of psychosis; and smoke ≥ 15 cigarettes per day. This paper presents the data from 200 participants that had completed the PRBQ at the baseline assessment of the RCT, as 36 participants were missing all data from the PRBQ.

### *Procedure*

Potential participants were identified from community mental health services, outpatient hospital clinics, psychiatric rehabilitation services, psychology and general practitioner practices and by self-referral from the general community. The research team contacted the potential participant and a brief screening interview was conducted to ensure all inclusion criteria were met. All participants provided written informed consent and completed a comprehensive baseline assessment for the RCT [13, 14]. The study was approved by the relevant hospital and university ethics committees at each site.

### *Measures*

#### *Demographic and clinical variables*

Demographic variables were collected using the Diagnostic Interview for Psychosis (DIP) [15]. Psychiatric diagnosis was determined using the Mini International Neuropsychiatric Interview (MINI) [16] and categorised according to: Schizophrenia spectrum disorder (schizophrenia; schizoaffective disorder; schizophreniform disorder); Bipolar affective

disorder (BPAD Type 1 and 2); and Other non-organic psychotic disorder (mood disorder with psychotic features; psychotic disorder not otherwise specified).

*Smoking variables*

The number of cigarettes smoked per day was calculated using the Drug Use domain of the Opiate Treatment Index (OTI) [17]. Participants were asked when their 3 most recent days of smoking occurred and how many cigarettes they smoked on each occasion. A simple calculation then provided an average daily number of cigarettes smoked based over a 28 day period. Nicotine dependence was assessed using the Fagerstrom Test for Nicotine Dependence (FTND) [18] with higher scores indicative of greater nicotine dependence (range: 0-10). Participants were asked at what age they started smoking daily, how many times they had attempted to quit and about their longest quit attempt.

*Perceived Risks and Benefits Questionnaire (PRBQ)*

Participants completed the 39 item self-report PRBQ by responding to the stem question "Use the scale below to rate how likely each item would be if you were to stop smoking," using 1=no chance; 2=very unlikely; 3=unlikely; 4=moderate chance; 5=likely; 6=very likely; 7=certain to happen. Items were grouped into 12 scales following McKee *et al.* [10]. Perceived Risks include 1) weight gain; 2) negative affect; 3) attend/concentrate; 4) social ostracism; 5) loss of enjoyment; and 6) craving. Perceived Benefits include 1) health; 2) well-being; 3) self-esteem; 4) finances; 5) physical appeal; and 6) social approval. Individual item responses were averaged to create the 12 scale scores, and the overall Perceived Risks and Perceived Benefits scales were calculated by averaging the risk and benefit items respectively.

*Statistical analysis*

Gender differences in demographic, clinical and general smoking variables were analysed using the $\chi^2$ test of independence for categorical responses and one-way Analysis of Variance (ANOVA) for continuous variables. Gender differences on the PRBQ were examined using multivariate analysis of variance controlling for diagnosis which significantly differed according to gender (MANCOVA). Within subject differences comparing overall ratings of perceived benefits versus risks were examined using paired sample statistics. Comparison of PRBQ scores from our results to those of smokers in the general population also seeking smoking cessation treatment in the McKee *et al.* study and non-treatment seekers in the Weinberger *et al.* study were made using single sample t-tests [10, 12].

**Results**

*Demographic, clinical and smoking variables*

Of the 200 participants, 60.5% were male and 39.5% female. Table 1 presents the characteristics of this sample by gender. Generally participants were aged in their early 40's, Australian born, and despite being heavy smokers with high levels of nicotine dependence, they had made several quit attempts and had been abstinent for lengthy periods in the past. There was a significant gender difference for psychiatric diagnosis [$\chi 2$ (2,200), $P$=0.003], with more males being diagnosed with schizophrenia spectrum disorders than females, and a greater proportion of females with BPAD and other forms of psychosis.

Table 1 about here

*Gender differences on the PRBQ*

Multivariate analysis of variance examining mean differences in perceived risks and benefits of smoking cessation, controlling for psychiatric diagnosis, revealed a significant effect of

gender [F(12,186)=2.72, *P*=0.002]. Female smokers with psychosis reported significantly greater perceived risks of quitting (*m*=4.53) than males (*m*=4.17). The comparison of individual scale means according to gender is presented in Table 2. There were very few gender differences on the PRBQ scales among our sample of smokers with psychosis. Female smokers did report significantly stronger beliefs in terms of weight gain and negative affect risks of quitting smoking than males. Specifically, within the negative affect scale, females were significantly more concerned than males about being more irritable (female *m*=5.23; male *m*=4.43) and less calm (female *m*=5.14; male *m*=4.15) upon quitting. Further, females had significantly higher belief ratings about the benefits of smoking cessation on their self-esteem than males.

Within subject differences revealed that females perceived significantly more benefits of quitting smoking than risks, t(78)=-9.62, *P*<0.001). Males also rated the perceived benefits of smoking cessation significantly greater than the perceived risks, t(120)=-14.29, *P*<0.001).

Table 2 about here

*Comparison to treatment seeking smokers in the general population*

Table 3 shows the comparison of PRBQ ratings from our sample of smokers with psychosis to those of smokers without mental illness in the general population also seeking smoking cessation treatment in the McKee *et al.* study [10]. Both females and males in our study had significantly lower belief ratings on all, but one, of the perceived risk and benefit scales of the PRBQ than smokers from the general population. Female smokers from our study rated their beliefs about the perceived risk of experiencing negative affect upon quitting similarly to the female smokers in the McKee *et al.* study (*P*=0.73) [10].

Table 3 about here

*Comparison to non-treatment seeking smokers in the general population*

Table 4 shows the comparison of our sample of smokers with psychosis to the sample from the Weinberger *et al.* study exploring PRBQ responses in smokers from the general population not seeking smoking cessation treatment [12]. It was not possible to make a gender comparison, as the Weinberger *et al.* study only presented results for their sample overall [12]. Our smokers with psychosis rated their beliefs about the perceived risks and benefits of quitting smoking very similarly to those of non-treatment seeking smokers in the general population. Our smokers were significantly more concerned about experiencing negative affect and less concerned about the loss of enjoyment after quitting than the smokers from the Weinberger *et al.* study [12]. Further, our sample rated the general well-being, self-esteem and physical appeal benefits of smoking cessation significantly higher than the general population sample.

Table 4 about here

**Discussion**

The present study is the first to use the PRBQ in people with mental illness, and the findings offer important insights, particularly given the limited research in this group of smokers. For female smokers with psychosis, smoking cessation interventions need to target issues related to weight and negative affect. Intervention strategies aimed at enhancing beliefs about the benefits of quitting smoking for both male and female smokers with psychosis are necessary.

We found few gender differences in the beliefs that males and females with psychosis anticipated as risks and benefits of quitting smoking. Females with psychosis more strongly endorsed overall perceived risks of smoking cessation. Additionally, the expectation of increased self-esteem after quitting smoking, and concerns about weight gain and negative affect were beliefs more strongly endorsed by the female smokers in our study. In keeping with the current findings, we previously found few gender differences in the characteristics and outcomes of smokers diagnosed with psychosis, and that females were significantly more likely than males to report they smoked to prevent weight gain [19]. Perhaps contrary to the beliefs of many health professionals, carers and even patients, both the males and females in the current study rate the benefits of quitting significantly higher than the risks. The expectation that smokers with psychosis will endure many negative experiences (e.g. increased stress, poor concentration, social exclusion) when trying to quit, is a powerful barrier to being routinely offered appropriate smoking cessation treatments. It seems that smokers with psychosis are possibly not as concerned about these potential risks of quitting.

When the current results are compared to those from smokers in the general population also seeking treatment for smoking cessation, there are two main differences. Firstly there is a lack of gender differences. In the general population, female smokers motivated to quit anticipate significantly more negative outcomes [10, 11] and are significantly more likely to acknowledge the benefits associated with quitting than males [10]. The current study generally failed to replicate this pattern of results in smokers with psychosis. The only findings consistent with research in the general population were that female smokers with psychosis have significantly higher overall risk perceptions associated with quitting than males, specifically in terms of weight gain and negative affect, and significantly anticipated improved self-esteem as a benefit of smoking cessation. As in our previous research, the

current sample of smokers with psychosis did not demonstrate other gender differences in general smoking variables (e.g. nicotine dependence; cigarettes per day), that are typically seen in smokers without mental illness [19]. The current study provides further evidence that smokers with psychosis are a more homogeneous group than male and female smokers in the general population.

The reasons for the lack of gender differences between our sample and smokers in the general population are unclear, but perhaps as we have previously postulated, the higher rates of smoking and nicotine dependence among smokers with severe mental illness may serve to override the effects of gender [19]. Another possibility relates to differing psychosocial roles and level of functioning among people with, and without, severe mental illness. Compared to the general population, fewer people experiencing severe mental illness engage in traditional gender roles that may typically influence a smoker's perceptions about quitting, e.g. as main caregiver of children or ill family members [20]. Additionally, people who experience severe mental illness often lack structured activities in their everyday lives [21]. Together, these factors may translate to a lack of gender differences in smoking behaviors. Another contributing factor to the link between smoking, gender and mental illness may involve neurobiological mechanisms. For example, estrogen exerts an effect on nicotine-evoked dopamine release, which may explain the gender differences in response to nicotine and smoking behavior evident in the general population of smokers [22]. However, people with psychosis are often hypoestrogenic which may in some way influence the homogeneity in smoking variables seen in our sample of smokers with severe mental illness [23].

The second key difference is that smokers diagnosed with psychosis in the current study are less concerned about the perceived risks of quitting than smokers in the general

population. While it is ideal to have low risk perception ratings, as prior research in the general population has found perceived risks to be negatively related to quit motivation and treatment outcome, this finding in the current study sample seems counterintuitive [10, 11]. Smokers with severe mental illness have higher rates of smoking and nicotine dependence, and together with the additional barriers to smoking cessation they face, they will consequently experience more of these risks and generally have greater difficulty quitting than the general population. Despite increasing knowledge and awareness of the health effects of smoking, anti-smoking campaigns were less effective for people with psychosis, who tended to detach their smoking behavior from its consequences [24]. The current sample of smokers with psychosis may have been aware of, but did not fully acknowledge, the potential risks associated with quitting. Furthermore, this sample of smokers with severe mental illness did not rate the benefits of quitting as highly as smokers in the general population. It could be possible that the low levels of confidence and self-efficacy in relation to quitting among smokers with psychosis may serve to dampen the expectation of positive outcomes upon quitting [25]. Further, it is possible that information delivered about the benefits of quitting via education, media and other influences may not have the same impact on smokers with psychosis, potentially as a consequence of the cognitive impairments they experience as part of the mental illness.

The belief ratings that smokers with severe mental illness in the current study have about the risks and benefits they may experience upon quitting, appear to lie between those of smokers in the general population wanting assistance with quitting and those not seeking treatment. When compared to smokers in the general population not seeking assistance with quitting, our smokers with severe mental illness did not have significantly different ratings on the majority of the PRBQ scales. There were a few differences though, with our sample being

more likely to anticipate improvements in their general well-being, self-esteem and physical appeal, and being more concerned about experiencing negative affect, yet less concerned about the loss of enjoyment upon quitting than smokers in the general population not seeking treatment [12]. This pattern of findings is reassuring, as the beliefs that smokers with mental illness have about the risks and perceptions of quitting are not entirely different from those of smokers in the general population, which further increases our understanding of smoking in this population and can inform relevant treatment options.

Evidence based smoking cessation interventions designed for smokers in the general population should routinely be offered to smokers with severe mental illness and such interventions need to be more intensive and longer term. Smoking cessation treatments can be further tailored for smokers with severe mental illness based on the findings from the current study. Interventions need to address the specific risk perceptions that female smokers with mental illness anticipate when quitting such as weight gain and negative affect (e.g. irritability, feeling less calm). These variables are significant barriers to quitting and are related to lower motivation and poorer outcomes in terms of smoking abstinence and relapse in female smokers in the general population [10, 26, 11]. Acknowledging and addressing weight concerns is important, and providing additional treatment related to healthy eating and exercise will be helpful, such as the multi-component intervention delivered to smokers with psychosis [13, 14]. Further, it is important to assist female smokers with strategies to manage negative affect they may experience during a quit attempt. It would be ideal for both male and female smokers with severe mental illness to have stronger beliefs regarding the benefits of quitting, as perceived benefits are positively related to quit motivation and treatment outcome in smokers in the general population [10]. Appropriate education about the benefits of smoking cessation should be delivered to all smokers with severe mental illness at every

possible opportunity, and motivational interviewing techniques can be utilised to further enhance these beliefs.

A limitation of the current study relates to the ability to generalise these findings to all smokers with severe mental illness. This study was conducted with a sample of smokers with psychosis in the community, in a non-acute phase of the illness, who had expressed some interest in quitting, and were participating in a multi-component study for smoking cessation and CVD risk reduction. Therefore, these results are not completely representative of all smokers with psychosis. Future research replicating this study in other samples of smokers with severe mental illness is required to further explore the pattern of results, lack of gender differences and comparisons to smokers in the general population. The relationship between the perceived risks and benefits of quitting and pre-treatment motivation and treatment outcomes need to be explored in this population of smokers. It would also be interesting to examine the pattern of risks and benefits of quitting in a sample of smokers with severe mental illness not seeking treatment for smoking cessation.

*Conclusion*

The results of the current study make an important contribution to understanding the similarities and differences in the perceived risks and benefits of quitting among smokers with severe mental illness and those in the general population. The male and female smokers with severe mental illness in this study who were seeking smoking cessation treatment generally had similar perceptions of the risks and benefits associated with quitting. Further, the perception ratings of the risks and benefits associated with quitting in smokers with severe mental illness sit somewhere between those of smokers in the general population wanting assistance with quitting and those not seeking treatment. The results of the present study

provide three important suggestions to target in smoking cessation interventions with people experiencing mental illness that will hopefully increase their chances of successful abstinence; the need to address concerns regarding weight gain and negative affect upon quitting for females; and the need to strengthen the benefits of quitting for all smokers with mental illness.

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**Table 1.** *Characteristics of baseline sample by gender*

| Variable | Total<br>n=200 | Female<br>n=79 | Male<br>n=121 |
|---|---|---|---|
| Age (m, SD) | 41.38 (11.10) | 42.67 (9.93) | 40.53 (11.76) |
| Race (% Australian born) | 83.0 | 83.5 | 83.3 |
| Years school education (m, SD) | 11.30 (2.21) | 11.33 (2.49) | 11.28 (2.02) |
| Cigarettes per day (m, SD) | 28.11 (14.88) | 26.75 (11.65) | 29.00 (16.64) |
| Age daily smoking (m, SD) | 18.11 (5.42) | 18.54 (5.84) | 17.82 (5.12) |
| FTND score (m, SD) | 6.96 (1.83) | 7.08 (1.73) | 6.89 (1.89) |
| Lifetime quit attempts (m, SD) | 6.02 (12.92) | 5.73 (8.90) | 6.22 (15.13) |
| Length (weeks) longest quit attempt (m, SD) | 262.67 (553.30) | 334.48 (726.96) | 215.39 (396.62) |
| Psychiatric diagnosis (n, %)** | | | |
| Schizophrenia spectrum disorder | 115 (57.5) | 34 (43.0) | 81 (66.9) |
| Bipolar affective disorder | 46 (23.0) | 26 (32.9) | 20 (16.5) |
| Other non-organic psychotic disorder | 39 (19.5) | 19 (24.1) | 20 (16.5) |

**significant gender difference in psychiatric diagnosis at $P<0.01$

**Table 2.** *Mean (SE) scale scores of PRBQ by gender*

| Scale | Total<br>n=200 | Female<br>n=79 | **Male**<br>**n=121** |
|---|---|---|---|
| Perceived risk | 4.31 (0.08) | 4.53 (0.13)* | 4.17 (0.10) |
| Weight gain | 4.46 (0.10) | 4.70 (0.16)* | 4.30 (0.13) |
| Negative affect | 4.63 (0.11) | 5.11 (0.16)*** | 4.33 (0.13) |
| Attend/concentrate | 3.52 (0.11) | 3.78 (0.20) | 3.34 (0.13) |
| Social ostracism | 3.55 (0.12) | 3.63 (0.19) | 3.50 (0.15) |
| Loss of enjoyment | 4.53 (0.13) | 4.53 (0.19) | 4.53 (0.17) |
| Craving | 5.54 (0.11) | 5.65 (0.18) | 5.47 (0.14) |
| Perceived benefit | 6.02 (0.07) | 6.18 (0.11) | 5.91 (0.08) |
| Health | 6.01 (0.08) | 6.08 (0.14) | 5.97 (0.10) |
| Well-being | 5.97 (0.08) | 6.16 (0.13) | 5.86 (0.10) |
| Self-esteem | 6.06 (0.08) | 6.29 (0.13)* | 5.91 (0.10) |
| Finances | 6.32 (0.07) | 6.46 (0.12) | 6.22 (0.10) |
| Physical appeal | 6.31 (0.08) | 6.37 (0.14) | 6.26 (0.10) |
| Social approval | 5.74 (0.09) | 5.99 (0.14) | 5.57 (0.12) |

*$P<0.05$

**$P<0.01$

***$P\leq0.001$

**Table 3.** *Comparison of PRBQ by gender in smokers with psychosis and a general population sample*

| Scale | Female | | Male | |
|---|---|---|---|---|
| | Current study n=79 | General population[a] n=273 | Current study n=121 | General population[a] n=300 |
| Perceived risk (m, SE) | 4.53 (0.13) | 5.11 (0.06)*** | 4.17 (0.10) | 4.76 (0.05)*** |
| Weight gain | 4.70 (0.16) | 5.60 (0.08)*** | 4.30 (0.13) | 4.77 (0.08)** |
| Negative affect | 5.11 (0.16) | 5.05 (0.08) | 4.33 (0.13) | 4.72 (0.08)** |
| Attend/concentrate | 3.78 (0.20) | 4.29 (0.08)* | 3.34 (0.13) | 4.01 (0.08)*** |
| Social ostracism | 3.63 (0.19) | 4.69 (0.09)*** | 3.50 (0.15) | 4.29 (0.08)*** |
| Loss of enjoyment | 4.53 (0.19) | 5.49 (0.09)*** | 4.53 (0.17) | 5.35 (0.09)*** |
| Craving | 5.65 (0.18) | 6.08 (0.07)* | 5.47 (0.14) | 6.01 (0.07)*** |
| Perceived benefit (m, SE) | 6.18 (0.11) | 6.62 (0.03)*** | 5.91 (0.08) | 6.47 (0.03)*** |
| Health | 6.08 (0.14) | 6.77 (0.04)*** | 5.97 (0.10) | 6.64 (0.03)*** |
| Well-being | 6.16 (0.13) | 6.56 (0.04)** | 5.86 (0.10) | 6.42 (0.04)*** |
| Self-esteem | 6.29 (0.13) | 6.65 (0.04)** | 5.91 (0.10) | 6.43 (0.04)*** |
| Finances | 6.46 (0.12) | 6.77 (0.04)** | 6.22 (0.10) | 6.58 (0.04)*** |
| Physical appeal | 6.37 (0.14) | 6.87 (0.03)*** | 6.26 (0.10) | 6.76 (0.03)*** |
| Social approval | 5.99 (0.14) | 6.51 (0.04)*** | 5.57 (0.12) | 6.36 (0.04)*** |

[a]Comparison sample of smokers in the general population from McKee et al. (2005)

*$P<0.05$

**$P<0.01$

***$P\leq0.001$

**Table 4.** *Comparison of PRBQ in smokers with psychosis and a non-treatment seeking sample from the general population*

| Scale | Current study n=200 | General population[a] n=188 |
|---|---|---|
| Perceived risk (m, SE) | 4.31 (0.08) | 4.2 |
| Weight gain | 4.46 (0.10) | 4.4 |
| Negative affect | 4.63 (0.11) ** | 4.3 |
| Attend/concentrate | 3.52 (0.11) | 3.4 |
| Social ostracism | 3.55 (0.12) | 3.7 |
| Loss of enjoyment | 4.53 (0.13) | 4.8* |
| Craving | 5.54 (0.11) | 5.4 |
| Perceived benefit (m, SE) | 6.02 (0.07) | n/a |
| Health | 6.01 (0.08) | 5.9 |
| Well-being | 5.97 (0.08) *** | 5.5 |
| Self-esteem | 6.06 (0.08) *** | 5.4 |
| Finances | 6.32 (0.07) | 6.2 |
| Physical appeal | 6.31 (0.08) *** | 5.5 |
| Social approval | 5.74 (0.09) | 5.6 |

[a]Comparison sample of smokers in the general population from Weinberger et al. (2010)

*$P<0.05$

**$P<0.01$

***$P\leq0.001$