Addiction: Understanding its Roots and Pathways to Recovery

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24 January 2025

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Abstract

Understanding the roots of addiction is important, as the beliefs individuals hold about addiction can significantly influence the success of various treatment approaches. This study investigates whether an addict's beliefs about the causes of addiction shape their perceived ability to recover, with a focus on age as a moderating factor. Two hypotheses are explored: (1) beliefs about addiction's causes significantly influence perceived recovery ability, and (2) age moderates the relationship between these beliefs and recovery perceptions. This study focused only on a research population of self-identified addicts. Participants were recruited through a convenience sample using an online link shared via the students' social networks. A correlational research design and quantitative analysis methods were used. The results show a non-significant relationship between root cause and perceived ability to recover. Similarly, no significant association was found between root cause and age. Thes lack of significant results may be attributed to factors such as the small sample size, the correlational design, and the recruitment method. Future research should address these limitations by using a more diverse population, alternative designs, and a holistic approach that considers personal, social, and cultural aspects of addiction

Keywords: Addiction, Physiological and Psychological causes of addiction, Perceived ability to recover, Age

Addiction: Understanding Its Roots and Pathways to Recovery

Millions of individuals worldwide are estimated to suffer from addiction and its related comorbidities, which profoundly affect their quality of life and contribute to a range of mental and physical health challenges (Jutras-Aswad, 2016). The World Health Organization (2024) highlights the severity of this crisis, reporting that alcohol consumption alone is responsible for approximately 2.6 million deaths each year, accounting for 4.7% of all global fatalities. Moreover, the use of psychoactive drugs contributes to around 0.6 million deaths annually. The global human and economic impact of addictive behaviors is immense. For example, in 2016, the United States alone faced an estimated cost of over $600 billion annually due to substance misuse and substance-use disorders, driven by expenses related to crime, healthcare, and lost productivity (Hunt et al., 2024). In addressing this critical issue, understanding the beliefs individuals hold regarding addiction is important, as prior research has shown that these beliefs can significantly influence the effectiveness of various treatment methods (Luke et al., 2002). By examining these beliefs, we can enhance treatment approaches by tailoring them to the individual, improving recovery outcomes, and reducing the broader societal impact of addiction.

Addiction has been the subject of extensive debate, particularly regarding its definition and the various interpretations surrounding it. There are numerous definitions of addiction. For instance, the term 'addiction' described the act of 'surrendering' or being 'deeply committed' to someone or something, as well as the habitual practice of a behavior, which could result in both positive and negative effects (Sussman & Sussman, 2011). In contrast, the APA Dictionary of Psychology (2023) defines addiction as a condition of psychological and/or physical dependence on substances such as drugs and alcohol, as well as on various activities or behaviors, including sex, exercise, and gambling. The way addiction is defined has important consequences. A clear and testable definition of addiction not only helps researchers connect it

to related topics, such as mental health or coping mechanisms, but also informs the development of effective treatment strategies, policies, and services (Sussman & Sussman, 2011). Different definitions can lead to varied understandings of the causes and treatments for addiction, influencing how individuals with addictions are perceived and treated by society. In this paper, we will follow the definition by the APA Dictionary of Psychology, as it provides a broad view that includes both substance-related and behavioral addictions.

There exists a significant discrepancy among various schools of thought regarding the underlying causes of addiction and their implications for treatment. This difference in perspective has led to an ongoing debate about whether addiction should be primarily seen as a matter of personal choice or classified as a psychiatric disorder. Efforts to understand addiction have resulted in a contentious debate between two models. The disease model emphasizes the physiological changes associated with addiction, including alterations in the function and structure of the nervous system, while the choice model is supported by epidemiological studies, psychological research, and self-report data (Lewis, 2011). This study will explore the psychological and physiological aspects of addiction. Additionally, gaining insight into how individuals with substance use problems perceive addiction is important for multiple reasons. It can be useful for maintaining treatment integrity, to see if clients accepted the belief system taught in treatment and for matching treatments and clients (Luke et al., 2002). People with different beliefs about addiction may vary in their preferred treatment settings or programs, adherence to treatment, satisfaction with treatment, and overall outcomes. Therefore, understanding addiction beliefs helps treatment designers match programs to clients' needs, making the treatment more effective and of higher quality (Luke et al., 2002).

Starting with the physiological perspective, both preclinical and clinical research has shown that while the manifestation of addiction and its effects vary from person to person, many of the behavioral impacts of drugs result from similar alterations in the brain across individuals

(Ferrer-Pérez et al., 2024). Research has demonstrated that genetic factors play a role in an individual's overall vulnerability to addiction, as well as in specific genes and gene groups that are linked to certain substances or types of addiction (Popescu et al., 2021). Research increasingly suggests that the dopaminergic-mesolimbic system plays a important role in the development of addiction, particularly due to its function in encoding motivation and reward (Popescu et al., 2021). The reinforcing effects of drugs primarily depend on dopamine signaling within the nucleus accumbens. Prolonged exposure to drugs results in glutamatergic neuroadaptations in dopamine pathways, especially affecting the prefrontal cortex and limbic regions, such as the amygdala and hippocampus (Volkow et al., 2019). These changes can significantly contribute to the onset of addiction in individuals who are vulnerable, as they alter the brain's reward pathways and diminish self-regulation abilities. This view of addiction as rooted in physiological changes can shape an individual's belief about its causes and, in turn, their perceived ability to recover. Believing that addiction is driven by permanent changes in the brain may lead individuals to view their condition as beyond their personal control, increasing their dependence on professional treatment or medication. As a result, recovery might be perceived as relying more on external support systems than on personal effort.

To better understand addiction, we must also consider the psychological perspective, which focuses on the cognitive and emotional factors that influence addictive behavior (Asensio et al., 2020). From this standpoint, it is important to acknowledge that early childhood experiences, social context, and environmental factors can significantly impact the neurobiology of addiction, increasing individuals' vulnerability to developing addictive behaviors (Asensio et al., 2020). The psychological perspective suggests that addiction is not based on physiological factors but is instead linked to an individual's perceived ability to recover, which is tied to their locus of control (Wicaksono & Maramis, 2023). Locus of control refers to an individual's belief in their ability to influence and manage the events in their life.

Adolescents with an internal locus of control are generally less likely to develop addictive behaviors compared to those with an external locus of control (Wicaksono & Maramis, 2023). Additionally, personality traits from the 'Big Five' model are important for assessing addiction risk, showing that a person's psychological characteristics can significantly influence their likelihood of developing addictive behaviors. (Asensio et al., 2020). Personal factors, which include these personality traits as well as cognitive processes and psychopathology, represent another category contributing to the varying risk of addiction (Shanmugam, 2017). These personal factors can influence the initiation of substance use, shape addictive behaviors, contribute to the development of related problems, affect motivation to seek treatment, and ultimately impact the dependency itself by moderating and influencing genetic expression (Shanmugam, 2017). Viewing addiction as a result from psychological factors may lead individuals to perceive it as being influenced by personal choices or circumstances, rather than external forces or physiological determinants. This perspective could align with an internal locus of control, where individuals believe they have the power to influence their own outcomes. As a result, this belief could help individuals feel more in control, motivating them to take an active role in their recovery. They may feel more confident in their ability to overcome addiction by relying on personal effort, such as developing healthier coping strategies or seeking support that aligns with their sense of autonomy.

Age

Understanding the factors that shape an individual's beliefs about addiction is essential for creating effective treatment strategies. In this context, this study focuses on age as a moderating factor. Research shows that initiating substance use at a younger age significantly increases the risk of negative consequences (Schick et al., 2020). This study begins by examining the physiological changes in the brain that occur as individuals age. As individuals age, several structural and functional changes occur in the brain. Research has shown that there

is a linear negative association between age and brain volume in many cortical and deep gray matter regions (Giorgio et al., 2010). Age-related brain volume loss is linked to changes in neuronal structure, such as fewer dendritic branches, reduced spines, and decreased neurogenesis. This gradual decline in brain tissue is a characteristic aspect of normal aging, commonly referred to as brain atrophy. Consequently, cognitive function tends to decline gradually as part of the normal aging process (Giorgio et al., 2010). These age-related changes are particularly relevant in the context of addiction, as they directly affect brain regions involved in decision-making, impulse control, and reward processing, which are key areas implicated in the development and management of addiction. Age-related cognitive impairments can make it more difficult for individuals to effectively monitor themselves, reducing their ability to recognize and control the effects of their actions, such as substance use (Kuerbis et al., 2014). This challenge is even more pronounced for older adults, as substances often have a stronger impact on their cognitive abilities compared to younger people, further complicating addiction management and recovery (Kuerbis et al., 2014). These cognitive limitations can make it harder for older individuals to adapt to recovery processes or overcome addictive behaviors. In contrast, younger individuals benefit from greater neuroplasticity and relatively intact cognitive function, which may make them more adaptable to the demands of recovery. This adaptability could result in similar perceptions of recovery ability across different age groups, despite the cognitive challenges faced by older adults.

Although the physiological effects of aging, such as brain volume reduction and decreased neurogenesis, are widely known, age also has a significant impact on psychological processes that drive behavior change, especially in the context of addiction recovery. Research indicates that age can influence important psychological factors, such as motivation and self-efficacy, both of which are important for effective addiction recovery (Kuerbis et al., 2023). As individuals age, their ability to recognize the severity of their intoxication or drinking issues

may decline, which can, in turn, lower their motivation to seek recovery. Additionally, older adults often struggle with maintaining belief in their capacity to change, creating further obstacles in engaging with and sustaining long-term recovery efforts (Kuerbis et al., 2023). Other research that examines age as a factor in shaping attitudes toward addiction suggests that older individuals tend to hold more positive views on substance use, a pattern observed across different cultures and for various substances (Lytle et al., 2019).

Age also influences the perceived ability to recover from addiction. Studies suggest that age plays a significant role in shaping beliefs about addiction and its treatment. Older adults are more likely to perceive addiction as a disease, while younger individuals often view it as a matter of personal choice (Russell et al., 2011; Lytle et al., 2019). As a result, if older adults perceive addiction as a disease, they may approach recovery with different expectations, potentially believing in the need for medical or therapeutic interventions. This perspective can enhance their perceived ability to recover, as they might be more open to seeking help and following treatment protocols.

In this study, we aim to investigate whether an addict's beliefs about the causes of addiction influence their perceived ability to recover. Studying this topic can contribute to improving the treatment of individuals with addiction. As previously mentioned, there is a difference of opinion among various schools of thought regarding the causes of addiction and their implications for treatment. Understanding a person's beliefs about addiction can directly affect their perceived ability to recover, as these beliefs influence motivation and self-efficacy. These different beliefs may influence treatment preferences, therapy adherence, and recovery outcomes. Gaining more insight into these beliefs can help tailor treatments to clients' specific needs. When determining the most effective treatment methods, age is an important factor to consider. Older adults, who are more likely to see addiction as a disease, may benefit most from medical-based interventions. Meanwhile, younger individuals, who often consider addiction a

choice, might respond more positively to behavioral therapies focused on personal responsibility and empowerment. Moreover, this research could help refine and expand existing theories and models. By looking at age as a moderator, this study highlights the importance of understanding how addiction and recovery might differ across life stages, showing why treatment approaches should be tailored to fit different age groups.

To conclude, this study aims to explore the primary research question: "Do an addict's beliefs about the roots of addiction influence their perceived ability to recover? Additionally, it examines the sub-question: how age moderates this relationship. To investigate these questions, we propose two hypotheses: (1) "An individual's beliefs about the causes of addiction significantly influence their perceived ability to recover," and (2) "Age significantly moderates the relationship between beliefs about the roots of addiction and the perceived ability to recover". To explore these hypotheses, this study will use a correlational research design and quantitative analysis methods, which will help us understand how beliefs, age, and recovery outcomes are connected.

Method

Participants and Design

This study included a research population of self-identified addicts. A convenience sample was recruited via an online link distributed through the students' social network. A total of 103 individuals participated in the online study. Of these, 53 (49%) participants were excluded due to incomplete responses to the questions or statements in the questionnaire. The final sample for this study consisted of 52% female and 48% male ranging from 20 to 64 years old with a mean age of 28 (SD=10.59). 58% of the participants identify as being addicted to a substance, whereas 42% report experiencing a behavioral addiction. We used a correlational research design and quantitative analysis methods, in which an individual's

Beliefs about the Causes of Addiction was the independent variable, age was the moderating variable, and Perceived Ability to Recover was the dependent variable.

Procedure

The study was approved by the Ethical Committee of the Faculty of Behavioural and Social Sciences at the University of Groningen (EC-BSS). The students recruited participants from their social networks (e.g., friends, family, and colleagues). They approached individuals to participate in a 7-minute online study, which consisted of a questionnaire available on the online platform Qualtrics. After receiving the invitation for participation, participants gave informed consent to participate in the online study. The questionnaire consisted of 41 items. The first seven questions covered demographics such as age, gender, type and duration of addiction, and socioeconomic background. The remaining statements were measured on a 5-point Likert scale, where a score of 1 indicates 'Strongly Disagree' and a score of 5 indicates 'Strongly Agree. Participants were offered the chance to receive a debriefing afterward. Participation in the study was entirely voluntary, and participants could choose to withdraw from the study at any time. The questionnaire items were selected from existing scales, with some adapted to a first-person perspective or revised to use the general term “addiction” instead of specific types, to suit the purpose of our study (Buckingham et al., 2013; Beck, 1988; DePierre et al., 2013; Luke et al., 2002; Schaler, 1997).

Measures

Root Cause

The Root Cause of Addiction refers to participants’ beliefs about the underlying factors driving addictive behavior, which is either physiological changes (disease model) or Psychological (choice model). Root cause was measured using 10 statements, including 5 physiological and 5 psychological. An example statement for the physiological aspect of addiction is: *“Addiction is a disease”* (Schaler, 1997) (α= .91). An example statement for the

psychological aspect of addiction is: "*I am personally responsible for my addiction"* (Luke et al., 2002) (α=.62-.64).

Perceived Ability to Recover

The Perceived Ability to Recover refers to an individual's belief in their capacity to overcome addiction and achieve long-term recovery, influenced by their understanding of addiction's causes and their confidence in treatment methods. Perceived ability to recover was measured using 10 statements. Example statements are: *"I think I can achieve recovery*" (Buckingham et al., 2013) (α= .82) and *"I might as well give up recovery attempts because I can't make things better for myself"* (Beck et al., 1974) (α= .93).

Age

Among the various moderators examined in this study, age is the primary focus of this paper. Age was measured by asking participants to report their age in years. The responses were analyzed as a continuous variable. Age was included as a moderator because it might affect beliefs about addiction and recovery, influencing how these factors impact perceived recovery ability.

Results

Preliminary Analyses

After data collection, the assumptions for linear regression were evaluated. It was confirmed that the assumptions of residual normality, linearity, and homoscedasticity were met. This evaluation was conducted by analyzing residual plots, predicted value plots, QQ-plots, and histograms. A visual inspection of the P-P plot shows that residuals are normally distributed, as they follow a straight line (Figure 1 in the Appendix). A visual inspection of the scatterplot suggests that residuals are equally distributed as they seem to be spread out randomly, which indicates homoscedasticity (Figure 2 in the Appendix). Moreover, no outliers

were observed, and there is no evidence of multicollinearity, as the VIF values were below 5 (VIF = 1.02).

Table 1 shows the descriptive statistics and correlations between the variables, including root cause, perceived ability to recover and age. The analysis shows that all correlations are non-significant, indicating that while some variables were positively or negatively correlated with each other, these relationships were weak and not statistically meaningful.

Table 1

Descriptive Statistics of Dependent, Mediator, and Independent Variables, and Correlations Between Variables

Variable	*N*	*M(SD)*	1	2	3	4
1. Root Cause - Physiological	50	2.83 (0.51)				
2. Root Cause - Psychological	50	3.36 (0.60)	-.133*** (p =0.357)			
3. Perceived Ability to Recover	50	3.63 (0.56)	-.168*** (p =0.242)	.130*** (p =0.379)		
4. Age	50	28.16 (10.59)	.095*** (p =0.512)	.054*** (p =0.708)	-.042*** (p =0.772)	

Note: Range Likert scales = 1-5; ***p XX

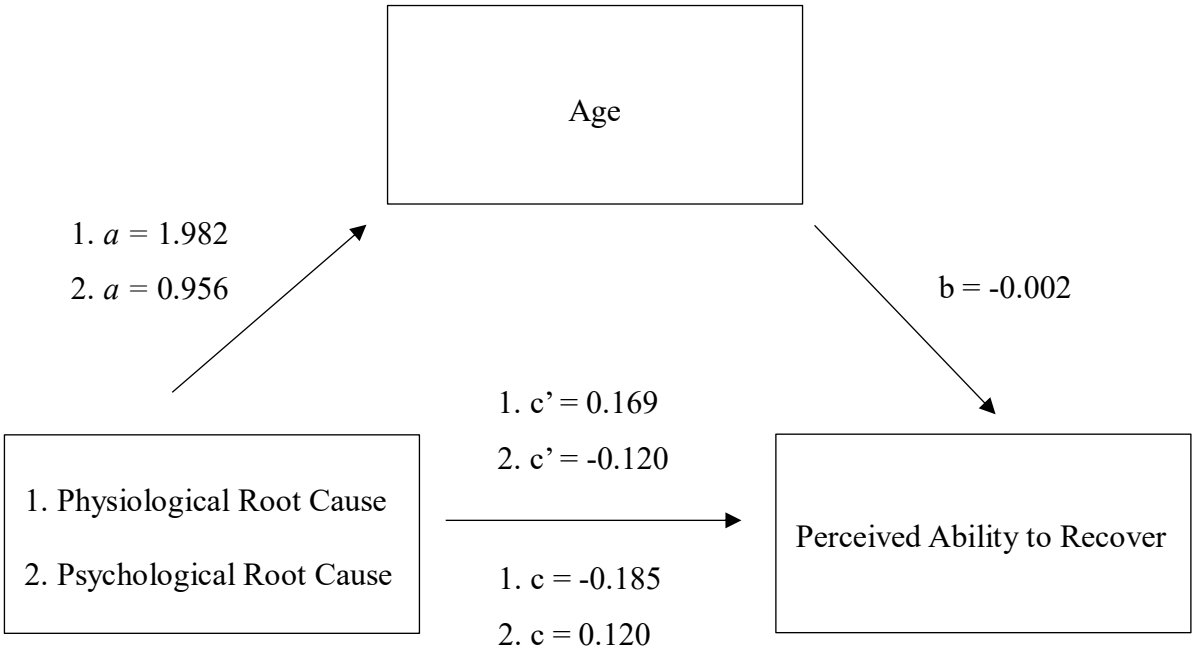
Main Analyses

Two simple linear regressions were performed: one with Physiological Root Cause Belief and one with Psychological Root Cause Belief as the independent variable, both with Perceived Ability to Recover as the dependent variable. Contrary to the first hypothesis, we found that Physiological Root Cause did not show a significant relationship with perceived ability to recover, $R^2 = .028$, $F\ (1,48) = 0.242$, $b = -0.185$, $p < .24$. Additionally, the results show a non-significant effect for Psychological Root Cause on Perceived Ability to Recover, $R^2 = .017$, $F\ (1,48) = 0.819$, $b = 0.120$, $p < .37$.

Two multiple regression analyses were conducted to examine the moderating effect of Age: one with Physiological Root Cause Belief and one with Psychological Root Cause Belief as the independent variable, both with Perceived Ability to Recover as the dependent variable. The values used in the analyses were standardized. Contrary to our second hypotheses, we found that the interaction effect between Physiological and Age on Perceived Ability to Recover was not significant, B= .169, *SE* = 0.098, t = 1.731, *p* = .09. Additionally, the results show that the interaction effect between Psychological and Age on Perceived Ability to Recover was also not significant B= -.120, *SE* = 0.072, t = -1.676, *p* = .101. This indicates that Age did not moderate the relationship between beliefs about the causes of addiction and perceived ability to recover.

Figure 1

*Unstandardized regression coefficients for the relationship between root cause and perceived ability to recover through age: p<.05**



Discussion

In this study, we aimed to investigate whether an addict's beliefs about the root causes of addiction influence their perceived ability to recover and how age moderates this relationship. By investigating how beliefs about the roots of addiction influence recovery and how age moderates this relationship, this study provides insights to improve tailored treatment strategies for individuals struggling with addiction.

Our main factors, as outlined and discussed in the introduction section, are beliefs about the causes of addiction, perceived ability to recover, and age as a moderating factor. In accordance with the context and purpose of the research, we suggest that an individual's perceived ability to recover is influenced by their beliefs about the causes of their addiction. Additionally, we suggest that age significantly moderates the relationship between beliefs about the roots of addiction and the perceived ability to recover. This study found that people's beliefs about what causes addiction is not significant related to their perceived ability to recover. More specifically, people's belief that addiction has physiological causes did not significantly affect how they perceive their ability to recover. Similarly, beliefs about psychological causes of addiction did not have a significant effect on individuals' perceived ability to recover. Finally, the moderating effect of age on the relationship between beliefs about addiction and perceived recovery ability was not significant.

Practical and Theoretical Implications

Root Cause

As previously noted, there is considerable debate between physiological and psychological perspectives regarding the root causes of addiction and their implications for treatment. Previous research suggests that seeing addiction as a brain-related disorder can lead to more positive views of specific treatment options (Morphett et al., 2018). Being aware of available medications and understanding their mechanisms could make overcoming addiction

feel more achievable and motivate individuals (Morphett et al., 2018). On the other hand, the psychological perspective argues that addiction is not rooted in physiological factors but instead focuses on the perceived ability to recover as being tied to one's locus of control. People with an internal locus of control are less likely to develop addiction than adolescents with an external locus of control (Wicaksono & Maramis, 2023). However, our study found that beliefs about addiction being rooted in either physiological or psychological causes do not significantly influence individuals' perceptions of their ability to recover.

There are several possible explanations for this, beginning with a few important methodological considerations. Part of the reason why the hypothesis was not supported could be attributed to the way participants were recruited. Participants were recruited through the students' social network. Therefore, the sample likely included individuals with limited experience of severe or long-term addiction, which may have reduced the diversity of experiences and perspectives needed to identify meaningful differences in addiction-related beliefs and recovery perceptions. Furthermore, this recruitment method limits the generalizability of the findings to the broader population of people with addiction problems. Another possible explanation why the results showed no significant effect could be the small sample size. Nearly half of the participants were excluded due to missing data, which significantly reduced the sample size. With fewer participants, there is less variability in the data. This makes it harder to identify meaningful relationships or interactions between variables. Additionally, the reduced sample size decreases the statistical power of the study, reducing the likelihood of detecting significant effects. In this study, we employed a correlational design, which could also be a plausible reason for the lack of significant findings. This approach limits the ability to determine whether addiction beliefs directly influence perceived recovery ability or if other factors are involved. Furthermore, it remains unclear if beliefs about the roots of addiction influences the recovery perceptions or if the

recovery perceptions of individuals shape their beliefs about addiction. The role of demand characteristics could also help explain the non-significant results in this study. Demand characteristics are closely connected to the nature of addiction. From a psychological perspective, addiction shows self-disruption, where people know their behavior is harmful but keep doing it anyway. Self-disruptive behavior often comes with a sense of shame, which can make the issue of demand characteristics even more challenging. Methodologically, demand characteristics and self-report measures pose significant challenges, particularly in our study. This issue is heightened by the implicit and inherent shame often felt by self-identified addicts. Participants may have adjusted or downplayed their beliefs and perceptions to avoid judgment, likely influenced by social desirability bias. This can hide the true relationship between addiction beliefs and perceived ability to recover.

Beyond methodological factors, there are also content-related explanations that may help clarify the lack of significant findings. First, the lack of significant results could be attributed to an overemphasis on biological factors, potentially overlooking the important personal and social dimensions that play a important role in the recovery process. According to The National Institute of Drug Abuse (NIDA) addiction is a “chronic and relapsing brain disease (Morphett et al., 2018). The brain disease model of addiction (BDMA) was developed with social objectives, aiming to offer an alternative to the moral model of addiction, reduce stigma, and encourage individuals to seek treatment (Snoek, 2017; Morphett et al., 2018). However, treating addiction as a chronic and relapsing brain disease tends to focus primarily on biological factors, placing excessive emphasis on the compulsive stage of addiction and overlooking the important personal, social, behavioral, and cultural factors that play a key role in addiction and recovery (Snoek, 2017; Morphett et al., 2017). This may lead to policies and perspectives that overlook the role of social and cultural factors, potentially reinforcing social inequalities that disproportionately affect minority communities (Green et al., 2021). These

factors likely play an important role in shaping how individuals view their ability to recover. As a result, our study variables may not have fully captured participants' recovery perceptions, as they do not account for the broader contexts in which recovery happens

The lack of a significant effect for psychological beliefs on perceived ability to recover in our study could be explained by the complex nature of self-efficacy (Snoek, 2017). As Snoek (2017) highlights, self-efficacy is not a fixed trait but rather something shaped by specific experiences. For individuals trying to recover from addiction, belief in their ability to change is essential. However, both underestimating and overestimating self-efficacy can hinder recovery. If individuals hold psychological beliefs about addiction that emphasize self-efficacy but fail to successfully control their substance use, they may experience increased discouragement, shame, or guilt, which can exacerbate the cycle of addiction (Snoek, 2017). In the context of our research, this dynamic might explain the lack of a measurable effect. Participants may have held varying levels of belief in their self-efficacy, with some potentially overestimating their capacity for change and others underestimating it. These variations, combined with individual experiences of success or failure in managing addictive behaviors, could have weakened the overall relationship between psychological beliefs and perceived ability to recover in our sample. Furthermore, the broad framing of psychological beliefs in our study may have missed the specific and situational aspects of self-efficacy, limiting our ability to detect significant effects.

Age

Age was hypothesized to moderate the relationship between root cause beliefs and perceived ability to recover. While earlier research indicates that age is an important factor in the addiction recovery process, our study did not find a significant moderating effect of age on the connection between addiction beliefs and perceived recovery ability. Possible explanations for this could lie in the demographic characteristics of our sample, such as a

relatively young population, or in the complexity of cognitive and psychological factors related to age. A possible methodological explanation for the lack of an effect is the homogeneity of our sample. When a sample lacks variability, such as in age, background, or life experiences, it becomes more challenging to detect differences or patterns. Our sample primarily consisted of young adults with similar socioeconomic and educational backgrounds, which may have resulted in a lack of diversity in beliefs about addiction and recovery. As a result, key factors that could influence the relationship between addiction beliefs and perceived recovery ability might not have been reflected in the data. A more diverse sample, including individuals from various age groups, socioeconomic statuses, and cultural backgrounds, might have revealed more nuanced effects and provided deeper insights into the role of age as a moderator.

A possible reason for not finding a significant moderating effect of age might lie in the unique vulnerabilities faced by older adults as outlined in the source. Aging introduces specific risks that may complicate the relationship between age, beliefs about addiction, and perceived recovery ability. Age-related physiological changes, such as reduced lean body mass, diminished liver function, and increased vulnerability to the effects of substance use. (Kuerbis et al., 2014). These vulnerabilities, combined with cognitive impairments like diminished memory and decision-making capabilities, could reduce the impact of beliefs about addiction on recovery perceptions. These vulnerabilities can also lead to more variation in recovery paths among older adults, as factors like health, social support, and other medical conditions differ from person to person. This variation might weaken the moderating effect of age by making the link between beliefs about addiction and recovery ability less consistent. For instance, an older adult facing severe physical or cognitive challenges might prioritize managing health concerns over reflecting on abstract beliefs about addiction. In this context,

beliefs about addiction might seem less relevant, further reducing their effect on their perceived ability to recover.

Another possible explanation is that beliefs about the roots of addiction may be less important than previously assumed, particularly when considering age. An important factor to consider is the role of identity and how it evolves during the recovery process. Research shows that people in early recovery often struggle with changes in their sense of self and identity. As they distance themselves from an identity that has failed them, they are faced with the challenge of creating an identity that aligns with their new social environment (Rodriguez & Smith, 2014). Similarly, research on young adults' health behaviors shows that conflicting demands and expectations make this struggle worse, leading to more confusion about their sense of identity. Young adults often face a complex struggle between their need for social connection and their awareness of the negative consequences of risky behaviors. This struggle, tied to the common habit of combining drinking or drug use with socializing, shows the important role of identity and ambivalence in recovery (Rodriguez & Smith, 2014). These findings suggest that the role of identity and ambivalence during recovery may be more significant than beliefs about the roots of addiction, particularly for young adults. The stage of young adulthood, focused on forming identity and adapting socially, brings unique challenges that affect the recovery process. Struggles with leaving behind an old identity and building a new one, combined with the challenge of balancing social connections and the risks of substance use, highlight the need to address age-specific struggles in recovery.

Directions for Future Research

As mentioned earlier, there are multiple possible reasons why we did not find significant results for either of the hypotheses. These limitations can be addressed and improved in future research. For the methodological implications, future research should consider adopting a more representative sampling method. This would lead to a more relevant and

generalizable result. It would also provide a better understanding of how factors like addiction beliefs and recovery perceptions interact in different groups. Additionally, a larger and more diverse sample could help show patterns and interactions that might not be visible in a smaller or less diverse group. In this study, we used a correlational research design, which limits the conclusions that can be drawn, particularly regarding causation. Future research should explore alternative methods, such as experimental research design. However, experimental designs also face challenges, such as their limited ability to reflect real-life conditions. Studying addiction in a lab setting has limited real-world relevance because it does not reflect an addict's actual experiences. To address this, researchers should consider combining different research designs. Moreover, future research could address the challenges posed by demand characteristics by using alternative methods that reduce social desirability bias. An example of this is the use of indirect methods, such as reaction time tasks. These can be useful because they rely less on people's conscious responses. In terms of content implications, future research should adopt a more holistic approach that considers personal, social, behavioral and cultural factors.

With millions of people worldwide suffering from addiction and its related comorbidities, profoundly impacting their quality of life and contributing to serious mental and physical health challenges (Jutras-Aswad, 2016), there is still a lot to learn about this complex problem. To conclude, although this study did not find any significant relations between the variables, the fact that the results are inconclusive stress the need for further research into this field. More specifically, by studying beliefs about the roots of addiction and their effect on perceived ability to recover, a more tailored treatment approach can be implemented. Future research should consider a broader range of variables, moving beyond beliefs and demographics, to capture the full picture of addiction and recovery. Addiction is not just a personal struggle, but a complicated human issue influenced by many factors, and understanding this is important for offering better support to those who need it.

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Appendix

Figure 1

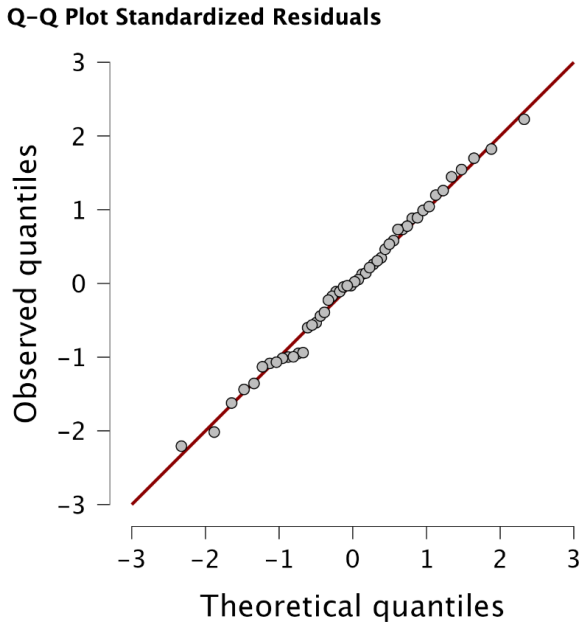
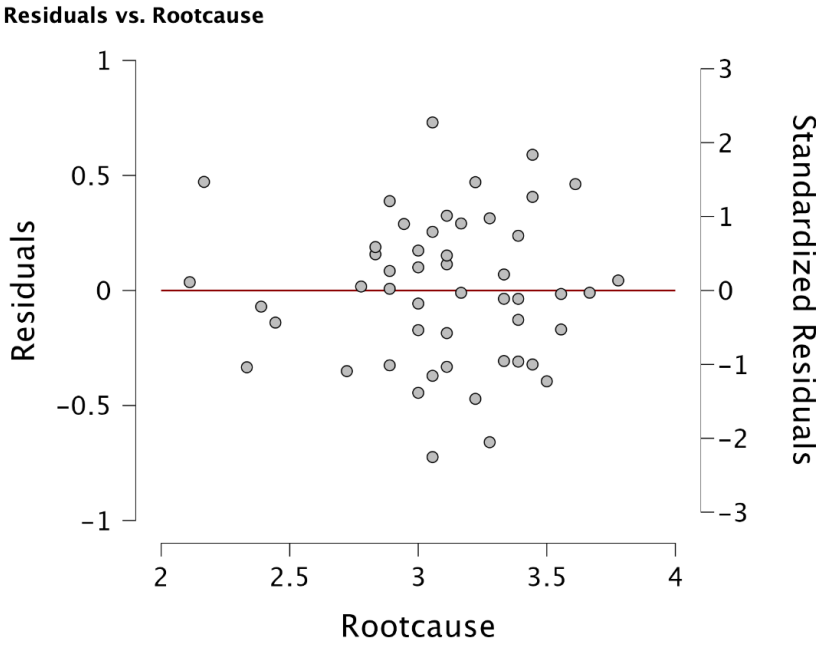
Figure 2