

Predictive Models of Relapses and Recovery in Young People with Risky Alcohol Consumption^{*}

Modelos predictivos de recaídas y de recuperación en jóvenes con consumo riesgoso de alcohol

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ABSTRACT

Risky alcohol consumption is the precursor of dependence. As relapses and recovery influence the success and cost of treatments, the objective of this work is to construct two predictive models—one for relapses and one for recovery—for individuals who engage in risky alcohol consumption. For this purpose, a cross-sectional study was conducted on 646 individuals of medium socioeconomic status, and the following instruments were applied: the AUDIT, Zung scales, a questionnaire of beliefs about alcohol consumption, two questionnaires that predict relapse and recovery, and the family APGAR. From the initial sample, 250 people (with a 64% female demographic, aged between 18 and 35) were identified as having risky alcohol consumption. A structural equations model concluded that the most influential variables for relapse were favorable beliefs about alcohol consumption, early onset, consumer friends, and academic, family, and social issues; whereas those that favored recovery were: good family functioning and late age of onset. It is recommended to expand the sample to be more heterogeneous to generalize the proposed models and compare individuals with and without risky alcohol consumption.

Keywords

consumption; alcohol; relapse; recovery; structural equations.

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RESUMEN

El consumo riesgoso de alcohol marca el comienzo hacia la dependencia. Dado que las recaídas y la recuperación afectan el éxito y costo de los tratamientos, el presente trabajo tiene como objetivo generar la construcción de dos modelos predictivos, uno para las recaídas y otro para la recuperación, en personas con consumo riesgoso de alcohol. El estudio fue predictivo transversal y se aplicaron los siguientes instrumentos a 646 personas de nivel socioeconómico medio: el Audit, las escalas de Zung, un cuestionario de creencias sobre consumo de alcohol, dos cuestionarios predictores de recaídas y recuperación, y el Apgar familiar. De la muestra inicial, se determinó que 250 personas (64% de sexo femenino con edades

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entre 18 y 35 años) tenían consumo riesgoso. A través de un modelo de ecuaciones estructurales se determinó que las variables más significativas para recaer son las creencias favorables en torno al consumo de alcohol, el inicio temprano, los amigos consumidores y los problemas académicos, familiares y sociales; mientras que las que favorecen la recuperación son el buen funcionamiento familiar y la edad tardía de inicio. Se recomienda trabajar con una muestra más heterogénea que permita generalizar los modelos propuestos e incluir una comparación entre personas con y sin consumo riesgoso.

Palabras clave

consumo; alcohol; recaída; recuperación; ecuaciones estructurales.

Mind-body and Mother Earth are inseparable (Tizón, 2015), it is the essence of the human, but it is forgotten, and in addictions and other health problems it is essential to consider this integration to understand that substance use disorders are multifactorial and include personal, family, sociocultural and environmental indicators.

Interest in health prevention has increased over the past decade given the difficulties in treating established disorders, which increase in crisis situations such as the Covid-19 pandemic (Tizón, 2020). Alcohol risk consumption is considered to exist when the individual has been inebriated more than once in the last year or has drunk more than four units of liquor (in women) or five (in men) within two hours (McCambridge et al., 2011; National Institute on Drug Abuse [NIDA], 2020; Obradors-Rial et al., 2014). Risk is estimated because it increases the eventuality of causing adverse effects for the consumer or others (Babor et al., 2001; World Health Organization [WHO] & Gobierno de España Ministerio de Sanidad y Consumo [GEMSC], 1994).

Among the personal factors found in the literature as a predictor of abusive alcohol consumption is the early onset, associated with the establishment of standard of risky consumption behavior. Bourque et al. (2016) and Pilatti et al. (2013), show that the pattern of alcohol consumption established at an early onset will likely last or increase over time. Kjeldsen et al. (2019) argue that early prevention

of alcohol consumption in adolescence has a positive impact on consumption behavior.

Similarly, among the variables that predict the increase in alcohol consumption are positive expectations about their *effects*, consumption with friends, little acceptance of the consequences, believing that it favors social interaction and emotional control (Negrete et al., 2015; Pilatti et al., 2013; Londoño et al., 2005; Obradors-Rial et al., 2014). Among these factors is also the low ability to withstand group pressure, extroversion, under personal control, lack of responsibility, background, and school behavioral *problems* (Arias Zapata et al., 2012; Cabrejas, 2013; Pilatti et al., 2013; Quiñonez et al., 2016; Weichold et al., 2014).

Regarding family and social factors involved in the emergence and maintenance of risky alcohol consumption, it is evident that young people imitate abusive behaviors of their relatives and peers and turn out in ingesting alcohol in excess (Castaño-Pérez & Calderón-Vallejo, 2014; Lee et al., 2004; Negrete et al., 2015; Obradors-Rial et al., 2014), situation that worsens when there are economic problems (Obradors-Rial et al., 2014). In opposition, the establishment of rules by parents concerning their alcohol consumption and low alcohol consumption (although not mothers) differentiates adolescents with zero or low consumption from those who consume (Aguirre-Guiza et al., 2017; Pilatti et al., 2013; Weichold et al., 2014).

In addition, the absence of family unity and the use of substances promotes overuse (Pilatti et al., 2013; Soto et al., 2016; Vargas et al., 2015; Weichold et al., 2014); however, it has been found that the assessment of the family interaction that the adolescent has is not related to his alcohol consumption (Trujillo-Guerrero et al., 2016) particularly in women (Ohannessian et al., 2016).

A global understanding of the issue of risky alcohol consumption implies an ecosystem vision (Bronfenbrenner, 1987; Newcomb, 1995) in which individual consumption is immersed (Ministerio de Salud y Protección Social [MSPS], 2013). For example, advertising and music that present positive ads about drinking can induce

the early onset of alcohol consumption (Castaño-Pérez & Calderón-Vallejo, 2014) and ignore the negative impacts of the drink (Valentine et al., 2010). In addition, an educational environment with abundant disputes where psychoactive substances are affordable, assist excessive alcohol consumption (Soto et al., 2016).

It is necessary to consider the process of change that includes relapse and recovery (Prochaska et al., 2008). In relapse, people return to consumption which is usual to occur (Simonelli, 2005; National Institute on Drug Abuse [NIDA], 2017), and should not be considered as a failure because it allows to learn from the problem (Fleury et al., 2016).

Causes of relapse include withdrawal syndrome (physical signs and psychological symptoms of discomfort), which occurs when alcohol consumption stops or decreases (Becker, 2008). Some syndromes such as the severity of alcohol consumption, anxiety about alcohol consumption in intake (individuals with severe craving), the age of onset of consumption, the presence of long-term social and personal problems related to alcohol (breaking relationships with family and friends, hopelessness), finances (unemployment, lack of income and poverty) or with legal problems (Kuria, 2013). Likewise, relapses are more common in individuals who lack coping and self-efficacy skills (US Department of Health and Human Services, 2000) and in general, with intrapersonal variables such as emotional regulation in decision-making considered in the somatic marker hypothesis (Blanco-Álvarez & Jiménez-Morales, 2015; Michelini et al., 2016).

Other factors associated with relapses are *risky or dependent consumption*, mainly when it has been maintained for more than six years (Tuithof et al., 2014). Individual tends to present aggressive behaviors more than impulsivity, negative emotional states (depression and anxiety), social pressure for substance use, interpersonal conflicts, low tolerance to frustration in interpersonal relationships, negative physical states, positive interpersonal emotional states and the urgency and temptation of alcohol use (Baars et al., 2013; Martin et al.,

2011). The presence of only one of these factors increases the possibility of relapse (Tuithof et al., 2014).

Beliefs regarding consumption have shown its preeminence to prevent alcohol consumption in young people (Londoño, 2007; Aravena & Londoño, 2019). The need to address the problem of relapses is recognized in order to generate procedures to prevent, control and face them (Witkiewitz & Marlatt, 2005).

Among the components that enable recovery are the different types of aids (aimed exclusively at the individual or including the family, in external or residential consultation, integral or with a single approach), aspects of the person (spirituality, commitment, comprehension of the effects of alcohol, understanding and realization of the transformation process, registration of relapses, coping with craving and errors), the family (support to solve difficulties and manage stress and performance), and social (near and far social networks) (Allen et al., 2014; Dermatis & Galanter, 2016; Schwarzer, 2014; Korcha et al., 2016; Lyytikäinen, 2016; Sandoz, 2014; Tripodi et al., 2010).

In Colombia, 2.7% out of survey young respondents are rated as a drinker at risk. The highest proportion of risk drinkers is located in the 18 to 44 age range, predominantly male (De la Espriella et al., 2015). In the Americas, excessive alcohol consumption is estimated to be a high-risk practice, more than half of high school students who reported alcohol consumption in the past month did so excessively. High-risk behaviors, such as early onset and excessive alcohol consumption, warn of the priority of developing selective and indicated prevention programs (Comisión Interamericana para el Control del Abuso de Drogas [CICAD] & Organización de los Estados Americanos [OEA], 2019).

These programs are based on predictive models or analyses that are generally used to forecast behavioral trends and patterns or relationships between variables and the development of these prediction models can be done through different statistical techniques

(Agüero & Minvielle, 2017), among which are the models of structural equations.

Preliminary evidence justifies the importance of designing a predictive relapse and recovery model for young *people* with risky alcohol consumption to channel early prevention actions. The models established on the subject have focused on the analysis of dependency leaving aside the study of risky consumption. In order to deepen understanding of this field and facilitate its prediction and intervention, it was proposed as general objective that a predictive model of relapses and recovery in young people was designed, based on the integration of personal, family, sociocultural and environmental factors found in the literature. This model contributes to understanding the problem of addictions and to drawing up a plan to reduce the uncertainty generated by this situation by including an ecological perspective.

Methods

Type of study

According to Ato et al. (2013) the study is of a cross-cutting predictive type since it sought to explore the functional relationships among the different personal, social, and situational factors linked to the intake of risky alcohol consumption.

Variables

Socio-demographic variables (Starting Age of consumption, Age, Sex, Socioeconomic and Educational level, Civil Status, Profession or Job, Psychiatric Background and other Illnesses, Medicine consumption and living arrangements). Personal, family, social, cultural and environmental factors, beliefs around alcohol consumption, friends who consume, depression and anxiety.

Participants

646 university students were surveyed, of which 250 drinkers who were interested in recovering from substance abuse were selected. 98% out of participants were single and this same percentage did not work; only 6% out of respondents reported consumption of other substances. The sample was selected for convenience. The average age of the participants was 20-year-old, with an age range between 18 and 31 years old, the average age of onset of consumption was 15.7 years, the female sex represented 64%. 44% were at the average socioeconomic level, 78.3% had no psychiatric history, 82.6% reported no diseases, 80.6% did not take medicines and 78.7% lived with their family.

Instruments

Sociodemographic Data Record Sheet: It includes personal data such as age, sex, socioeconomic and educational level, marital status, profession or trade, psychiatric and other illness history, drug use and people with who they live.

Test AUDIT: WHO's Identification Test for Alcohol Consumption Disorders estimates the pattern of risky or harmful alcohol consumption, consisting of 10 items that measure the level of risk (Babor et al., 2001).

Questionnaire of relapse predictors in young alcohol consumers (Vargas et al., 2023), has 29 items whose objective is to evaluate personal, family, social, cultural, and environmental factors that trigger recidivisms in alcohol consumption in young people from 18 to 35 years old. This questionnaire has various response options, the internal consistency index of this instrument obtained with Cronbach's alpha with all items was 0.71 and the alpha values in the different dimensions were 0.73, 0.92, 0.83, 0.77, 0.71. 0.52 and 0.69.

Questionnaire of recovery promoters in young alcohol consumers (Vargas et al., 2023), this instrument is composed of 32 items, its objective is to evaluate personal, family, social, cultural,

and environmental factors that facilitate the maintenance of regulation or the complete abandonment of alcohol consumption in young people from 18 to 35 years old and has various response options. The value of Cronbach's alpha coefficient, used to establish internal consistency, with all items was 0.98 and each factor was 0.98, 0.92, 0.94, and 0.95 respectively.

Zung Self-Rating Depression Scale (1965) quantifies the presence of symptoms of depression, was validated in Colombia by Lezama (2012), consists of 20 items measuring dominant affection and compromised psychological and physiological components. It has four answer options. The internal consistency evaluated with Cronbach's alpha was 0.55.

Zung Self-Rating Anxiety Scale (1971), validated in Colombian population by Cabarcas & Córdoba Mena (2012), seeks to determine the presence of symptoms of anxiety, it consists of 20 items that measure dominant affection and the psychological and physiological components compromised. It has four response options that go from never to always, has an adequate level of internal consistency, the Cronbach's alpha was 0.73.

Belief Questionnaire on alcohol consumption designed by Valencia et al. (2009) composed of 20 items, it was based on the Belief Model which includes the following dimensions: perception of risk/vulnerability/severity, perceived barriers, perceived benefits, subjective rules and keys to action, the options answer were in Likert Scale, the internal consistency determined with the Cronbach's alpha score of 0.87.

WHO short-version family APGAR (1978), adapted for Colombia by Forero et al. (2006), assesses the level of family dysfunction through five questions with answer choices ranging from never to always, this scale has an internal consistency level of 0.79.

Procedure

The research was carried out in four phases: Phase 1. A bibliographical review was carried out on risky alcohol consumption. Phase 2. A letter

was sent that included the objectives, the request to participate in the study and the informed consent to the directives of two institutions. It had the endorsement of the Ethics Committee of the Catholic University of Colombia through Act number 4 of October 7, 2018. Phase 3. The instruments were applied in person, individually and in a group with the informed consent of the participants and anonymity and confidentiality were guaranteed. Phase 4. The database was prepared and the analysis was carried out.

Data analysis

To decide what type of statistics should be used, the distribution of variables was initially considered with the Kolmogorov-Smirnov test. To determine the best fit model, bivariate analyses were performed among all predictor variables and the two criterion variables (Relapse and Recovery). The model's goodness-of-fit study followed Pilatti's et al. (2013) instructions, the reason for Chi-squared was obtained on CMIN/DF degrees of freedom, the CFI and GFI indices, the RMSEA index, the non-standard adjustment index, or Tucker-Lewis (TLI), and the Incremental Fit Index (IFI) (Leal-Costa et al., 2016). The model proposed involves the relationship between the variables of risky alcohol consumption in young people, relapses and recovery. An analysis of adjustment of the empirical model to the theorist with Structural equations were performed with the software SPSS version 25 and the AMOS of SPSS version 21.

Results

To determine the best fit model, bivariate analyses were performed among all predictor variables and the two criterion variables (Relapse and Recovery). The relapse variable had a normal distribution, but the recovery variable was not distributed normally $K-S=0.04$ y $p=0.20$ for relapse and $K-S=0.12$ y $p=0.00$ for recovery. In the gender difference analysis, t for Student was used for unrelated relapse samples and the non-

parametric Mann-Whitney's U test for recovery. No statistically significant differences were found by sex or relapse or recovery; t of Student = 1.62 and $p = 0.12$ for relapse and $Z = -1.12$ and $p = 0.27$ for recovery, therefore, it was not considered appropriate to differentiate models by this variable.

Concerning the relapse variable, no statistically significant differences were found between psychiatric background variables. Do you have any illnesses? Do you take any medications? and who do you live with? for this analysis the one-way Anova was used.

Concerning the relapse variable, no statistically significant differences were found between: psychiatric background variables ($F = 1.67$, $p = 0.19$), do you have any illnesses? ($F = 2.11$, $p = 0.15$), do you take any medications? ($F = 1.39$, $p = 0.24$) and who do you live with? ($F = 0.20$, $p = 0.89$) for this analysis the one-way Anova was used.

Anxiety and depression, assessed through the Zung instrument, did not contribute to the study. The family APGAR used to determine family function turned out to be one of the relevant variables.

Relapses

The factors that contributed to the predictive model of relapse in risky alcohol consumption were early onset of consumption, alcohol-consuming friends, academic, family, social problems and beliefs around alcohol consumption (Table 1 and Figure 1).

Table 1
Significant correlations with Relapses

Variable	Spearman ρ
Age of onset	-0.29*
Consumption with friends	-0.20*
Academic problem	0.21*
Family	0.32*
Social	0.26*
CCA	0.47*

Note. * $p < 0.01$. CCA: beliefs on alcohol consumption

The model is shown in Figure 1. The magnitude and sign of the estimated parameters find the correlation with relapses as follows: the early onset of consumption at -0.15. (< 0.01), alcohol-consumer friends -0.11. (< 0.01), academic problems 0.05 (< 0.01), relatives 0.14 (< 0.01) and social 0.08 (< 0.01) and beliefs on alcohol consumption 0.34 (< 0.01).

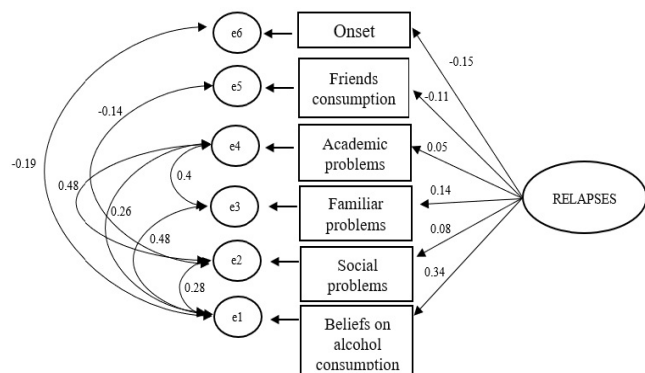


Figure 1.
Predictive relapse Model.

Recovery

The Mann Whitney's U test was used to analyze the association between the recovery variable and the risk variable, ($Z = 2.705$, $p > 0.005$). In order to establish whether there are statistically significant differences in recovery in psychiatric history. Do you have any illnesses?

Do you take any medications? Who do you live with? Kruskal-Wallis' the one-way non-parametric Anova was used. No statistically significant differences were found with these variables. Table 2 and Figure 2 include variables that have statistically significant differences in recovery.

Table 2
Significant correlations with Recovery

Variable	Spearman ρ
Age of onset	0.13*
AUDIT	-0.22**
APGAR	0.21**

Note. * $p < .05$. ** $p < .01$

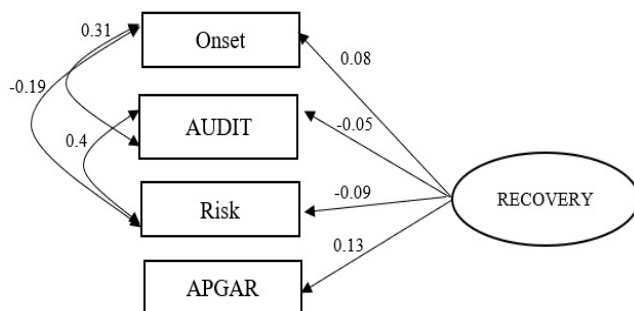


Figure 2.
Predictive model of recovery.

Factors that are part of the predictive model of recovery in risky alcohol consumption were age of onset, level of consumption and family functioning.

In Figure 2 the results find the relationship with recovery as follows: Age of onset at 0.08 ($p=0.04$), Audit consumption level -0.50 (< 0.01 .) and risk -0.09 and family functioning 0.13 (< 0.01). The covariance or joint variation between Onset and Risk is 0.19, Onset and Audit 0.31, and Audit and Risk 0.40.

Table 3 shows the goodness-of-fit results of the Relapse and Recovery models, the $GFI \geq 0.90$, $RMSEA \leq 0.05$, IFI , TLI , $CFI \geq 0.90$ indexes,

have a good fit of the tested models (Hu & Bentler, 1999).

Table 3
Goodness-of-fit statistics for Relapse and Recovery models

Model	CMIN/DF	GFI	IFI	TLI	CFI	RMSEA	Interval
Relapse	1.49	0.98	0.98	0.96	0.98	0.04	[0.00; 0.09]
Recovery	1.42	0.99	0.98	0.94	0.98	0.04	[0.00; 0.12]

Note. CMIN/DF: Reason for chi squared on degrees of freedom; GFI: Overall goodness-of-fit index; IFI: Incremental adjustment rate; TLI - Tucker-Lewis Index; CFI - Comparative Adjustment Index; RMSEA - Mean Quadratic Error.

Discussion and conclusions

The general objective of this work was to develop a predictive model for relapse and recovery, in people with risky alcohol consumption. The models found integrate personal, family, sociocultural and environmental factors reported by various authors (Bourque et al., 2016; Bronfenbrenner, 1987; Caamano-Isorna et al., 2020; Castaño-Pérez & Calderón-Vallejo, 2014; Fagan et al., 2015; Lee et al., 2004; Moure-Rodriguez et al., 2018; Pilatti et al., 2013; Scoppetta & Ortiz Garzón, 2021). The findings contribute to the understanding of the problem of addictions and in particular the risky consumption of alcohol, important for early prevention.

Two predictive models were formed, relapse and recovery that integrate personal, family, sociocultural and environmental factors reported by various authors, verified with the application to a sample of the population, the findings contribute to the understanding of the problem of addictions, and particularly to the risky consumption of alcohol, important for the priority early prevention in actions in this field.

The early onset of alcohol consumption that is part of the factors of the predictive relapse model has been associated with the establishment of a risky standard consumption behavior (Bourque

et al., 2016; Pilatti et al., 2013). As in other studies, it was found that use with friends is among the variables that predict the increase in alcohol consumption (Negrete et al., 2015; Pilatti et al., 2013; Londoño et al., 2005; Obradors-Rial et al., 2014).

On the other hand, the proposed models include academic, family and social issues, described as behavioral problems in school by other authors (Arias Zapata et al., 2012; Cabrejas, 2013; Pilatti et al., 2013; Weichold et al., 2014) or family and school models who drink in excess (Castaño-Pérez & Calderón-Vallejo, 2014; Lee et al., 2004; Negrete et al., 2015; Obradors-Rial et al., 2014). Lack of harmony (Pilatti et al., 2013; Soto et al., 2016; 2015, Weichold et al., 2014). Likewise, beliefs on alcohol consumption have been related to the use of alcohol by young people in other investigations (Londoño, 2007; Aravena & Londoño, 2019). The application of family APGAR was relevant for measuring family functioning since this variable was significant in both models. *Advertising and music* that present positive ads about drinking can induce the early onset of alcohol consumption reported by Castaño-Pérez & Calderón-Vallejo (2014) and ignore the negative impacts of alcohol mentioned by Valentine et al. (2010) were not relevant in this study. Probably in the Colombian context there is not enough advertising against alcohol and young people only see the positive aspect of consumption that favors sociability.

Many consumers who abuse alcohol are not aware of the situation, do not present a desire for control and therefore, they feel not to need to recover. In addition, a large proportion of the drinkers stated in various items of the Questionnaires on relapse and recovery predictors, the option does not apply. Denial and stigma influenced many participants not to answer the Questionnaire on relapse predictors and recovery in young people with risky alcohol consumption. since at the time of application some denied consumption even when the AUDIT showed otherwise.

Among the components that enable recovery are the different types of aids (aimed exclusively

at the individual or including the family, in external or residential consultation, integral or with a single approach), aspects of the person (spirituality, commitment, comprehension of the effects of alcohol, understanding and realization of the transformation process, registration of relapses, coping with craving and errors), the family (support to solve difficulties and manage stress and performance), and social (near and far networks) (Allen et al., 2014; Dermatis & Galanter, 2016; Schwarzer, 2014; Korcha et al., 2016; Lyytikäinen, 2016; Sandoz, 2014; Tripodi et al., 2010) Neither, the early onset or level of consumption are mentioned. AUDIT results of -0.05 and risk of -0.09 indicate that variables that measured the level of consumption (risky consumption) although they are important to recovery have less weight than age of onset and family functioning variables.

In relation to recovery, the findings of this study make it possible to conclude that the later the onset of use and the lower the level of consumption, the greater the recovery. The age of onset contributes more to recovery than to relapse and lower consumption of parents and better family functioning the easier recovery is. This aspect contributes to the prevention and prognosis linked to the importance of parent behavior with alcohol consumption and family harmony for recovery, results that confirm what is indicated by Allen et al. (2014), Dermatis & Galanter (2016), Schwarzer (2014), Korcha et al. (2016), Lyytikäinen (2016), Sandoz (2014) and Tripodi et al. (2010).

The limitations of this study related to the sample as it mostly corresponded to average socioeconomic levels, two-thirds of them made up of women. In future studies the sample should be more heterogeneous.

This model contributes to the understanding of addiction issues and in particular to alcohol risky consumption, which is important for priority early prevention in actions in this field.

The aspect related to the absence of consumption of parents and a good family functioning contributes to the prevention and prognosis of risky consumption.

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Notes

- * Research article