




Correlated factors of depression among male and female inmates

Fatores associados à depressão em homens e mulheres presos

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ABSTRACT: *Introduction:* The prevalence of depression is high in the prison system, and the differences between sex regarding associated risk factors are still not clear. We analyzed the correlated factors of depression among incarcerated men and women in the state of São Paulo, Brazil. *Methodology:* A cross-sectional study with stratified and multi-stage probabilistic sample was performed. Composite International Diagnostic Interview (CIDI) was applied for psychiatric diagnostic classification, as well as a questionnaire on criminal history with 1,192 men and 617 women. Lifetime prevalence of mental disorder was calculated, and association analysis performed by multinomial logistic regression stratified by sex. A dependent variable was categorized into depression, any other mental disorder and no mental disorder (reference). *Results:* The prevalence of depression was of 33.3% (30.3 – 36.5) in women and 12.9% (11.1 – 15.0) in men. Depression was associated with disciplinary penalty, being in a stable relationship, physical health problems and history of infringement in adolescence in men. Regarding other mental illnesses, the correlated factors were historical transgression during adolescence and re-offense. Among women, depression was associated with physical health problems, drug crimes, violent crimes and being imprisoned. *Discussion:* Results confirmed the differences between associated factors with depression regarding sex. *Conclusion:* Differences in the profile between men and women require effective specialized programs, considering the need for coping strategies for incarcerated men and health-related rehabilitation for women with depression.

Keywords: Prisoners. Depression. Health.

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RESUMO: *Introdução:* As prevalências de depressão em presídios são altas, porém não há clareza sobre os fatores de risco entre os sexos. Analisamos os fatores associados à depressão entre homens e mulheres presos no estado de São Paulo. *Metodologia:* Estudo transversal, de 2006 a 2007, com amostra probabilística estratificada e em múltiplos estágios. Aplicaram-se o *Composite International Diagnostic Interview* (CIDI) para diagnóstico psiquiátrico e questionário sobre histórico criminal em 1.192 homens e 617 mulheres. As prevalências foram calculadas para vida e fatores associados, para cada sexo, analisadas por meio da regressão logística multinomial. A variável dependente foi categorizada em: depressão, outro transtorno e sem transtorno mental. *Resultados:* A prevalência de depressão em mulheres foi de 33,3% (30,3 – 36,5) e em homens de 12,9% (11,1 – 15,0). Entre homens, foram associados à depressão falta disciplinar no presídio, histórico infracional na adolescência, ter companheira e problemas de saúde. Associados a outros transtornos: histórico infracional na adolescência e reincidência. Entre mulheres, as associações com depressão foram: problemas de saúde, crime de drogas e violência, estar presa em penitenciária e reincidência. Outros transtornos foram com problemas de saúde, reincidência, histórico infracional e crime violento. *Discussão:* Resultados confirmam estudos sobre diferenças entre os sexos para fatores associados à depressão. *Conclusão:* Há diferenças no perfil de homens e mulheres, que demandam distintas estratégias de enfrentamento, como *coping* e reabilitação em saúde para as mulheres com depressão.

Palavras-chave: Prisioneiros. Depressão. Saúde.

INTRODUCTION

Mental illness in prison institutions as a result of prison confinement,¹ is a public health issue recognized worldwide, especially due to the high prevalence of depression^{2,3}. This, in turn, leads us to think about the strong association with suicidal behavior^{4,5}, worsening health conditions and issues regarding the re-socialization of prisoners after release. The difficulty of resocialization may present a vicious cycle of risk to illness, increasing the chances of drug involvement, criminal reoffense⁶ and (re-)victimization due to interpersonal violence, especially among women⁷.

The conditions of incarceration expose the individual to a series of risk factors related to the development and maintenance of depressive conditions⁸. These include the breakdown of affective relationships, isolation, abrupt rupture of daily activities and idleness⁹. Studies show that the abrupt breakdown of social ties that occurs when entering a prison system, i.e., in temporary detention centers, leads to higher rates of depression than those in penitentiaries, when prisoners have already been sentenced^{10,11}.

Although the prevalence of depression among inmates and the risks related to this morbidity are consistent in the literature, gender differences in relation to the associated risk factors are not yet fully understood. This is because the existing studies usually analyze the population of one sex or only one type of risk factor (clinical or criminal)¹⁰.

The incarceration period can be a great opportunity to implement social and health services for a population commonly marginalized by public policies¹². However, for these polices

to be effective, it is necessary to know the demands of this population, and respect the specificities of gender that may incur different factors related to the development of depression.

According to the study carried out by the Ministry of Justice in 2014, there are 622,202 people in the Brazilian prison system, which is equivalent to the fourth largest population in the world¹³. Despite this magnitude, the country lacks studies on factors associated with depression among men and women in a large sample. Our objective was to study the clinical and criminal factors associated with depression among men and women in the state of São Paulo.

METHODOLOGY

A cross-sectional study was conducted between May 2006 and January 2007, and data collection began in October 2006. The study included 105 closed-prison units, five of which were women's penitentiaries (PF0, four female resocialization centers (CRF), 32 male provisional detention centers (CDP) and 64 male prisons (PM).

The sample was probabilistic and multistage, stratified by the five regional coordinates of the State, responsible for the prison units. For the men, two units were drawn for each regional coordination, totaling 20 prisons; 10 penitentiaries and 10 CDP. For women, all nine prison units (five penitentiaries and four resocialization centers) were included, and only the prisoners were drawn. The sample was random, and the prisoners were drawn from a list provided by the management of each prison unit. The inclusion criterion was to be in custody in closed-regime units. On the other hand, exclusion criterion were to be in maximum security units, due to the access difficulty, and in custody and psychiatric hospital treatment, as these institutions treat prisoners with known mental disorders.

The following was considered for the sample calculation:

- population size in each stratum;
- estimated prevalence of mental disorder of 2% - acceptable minimum frequency of 1%;
- confidence level of 95%;
- estimated loss of 10%.

Based on these parameters, there was a total of 2,320 scheduled interviews which were distributed proportionally, as follows:

- 690 in female prison units;
- 820 in penitentiaries;
- 810 in CDP.

INSTRUMENTS

The Brazilian version of the International Diagnostic Interview (CIDI) version 2.1¹⁴ was used for psychiatric diagnosis, and the 10th edition of the International Classification

of Diseases (ICD-10) was the reference used in this study. The following sections of CIDI 2.1 were used in the research: phobic and anxious disorders, with the exception of the diagnosis of specific phobia; depression (depressive episode and recurrent depression); mania; psychotic disorders; substance use disorders; obsessive-compulsive disorder; and post-traumatic stress disorder.

The following sections were included in the self-reporting questionnaire:

- sociodemographic data (marital status: with partner / no partner, age: 18 to 24 years / 25 to 29 years / 30 to 36 years / over 37 years of age, religion: yes / no and education: illiterate / from 1 to 11 years of schooling / 12 or more years of schooling);
- history of any type of illness (yes / no);
- Penalty conditions (type of prison unit: provisional / penitentiary detention center; number of prisoners per cell; intimate visits: yes / no; family visits: yes / no; disciplinary offense: yes / no);
- criminal profile (sentence time: up to one year / more than one year, criminal history during adolescence: yes / no, repeat offender: yes / no and type of crime: against property, drug related crime and violent crime).

The variable “criminal history during adolescence” was evaluated by adolescent offenders entering the socio-educational system. For the variable “type of crime”, those that represent a threat to the physical integrity or life of the victim (for example, robbery, rape, murder, bodily injury and kidnapping) were considered violent crimes.

STATISTICAL ANALYSIS

The variables were described in absolute and relative frequencies, as well as the estimated prevalence of depression (dependent variable). All analyzes were adjusted for the sample design by the analysis of complex samples¹⁶. For the analysis of the associated factors, a multinomial logistic regression model was performed by sex. Individuals considered to be depressed in this study were those who met criteria for depressive episode or recurrent, moderate or severe depression. The dependent variable was categorized as:

- have depression;
- have any other mental disorder;
- do not have mental disorder.

The reference variable was “do not have mental disorder” for both models.

The independent variables selected for regression modeling were those that presented $p < 0.20$ in relation to depression, analyzed by the χ^2 test. In the final model, the variables with a significant association were maintained or were at least 10% adjusted to the other variables. The adjustment of the models was analyzed by the Akaike

(AIC) and Bayesian (BIC) information criteria, generated by the regression analysis¹⁷. Stepwise was used for the inclusion of the variables in the multiple model in order to facilitate the identification of mediating and confounding variables and their respective interactions. The inclusion order of the independent variables followed the increasing order of the p value.

ETHICAL AND LEGAL ASPECTS

The research was approved by the Research Ethics Committee of the Federal University of São Paulo (process # 1,051 / 05) and conducted in accordance with guidelines and norms for conducting research with human beings of the National Health Council (Resolution No. 19,692).

RESULTS

A total of 1,809 prisoners (1,192 men and 617 women) were interviewed, representing a sample loss rate of 26.2% for the male population and 10.5% for the female population. When considering the type of prison unit, the losses varied between 4% in female CR, 23.7% in CDP and 17% in PM. The power of the sample remained at 80%, after the analysis of the losses, which is considered a statistically acceptable value.

The main causes of the sample losses were:

- difficulty of access to the drawn prisoners (n = 336);
- refusals (n = 135);
- transfer of prison unit (n = 16).

The profile of the men was: white; from São Paulo; between 18 and 27 years of age; have a partner; had employment prior to incarceration; be imprisoned in a penitentiary; have no history of juvenile delinquency; not a repeat offender; be imprisoned for more than one year; committed violent crime; not committed a disciplinary offense in the prison and no physical health problem. The difference in the profile of the women was only in the marital status - the majority of the women did not have a partner (Table 1).

Regarding the regression analysis among men (Table 2), in the bivariate analysis they were associated with depression: criminal record during adolescence, have a partner, be a repeat offender, be imprisoned for a period of up to one year, serving sentence in a penitentiary and have physical health problems. In the multiple analysis, the variables that remained associated were criminal record during adolescence, have a partner and physical health problems. The variable that had association was to have a lack of discipline. Regarding other mental disorders, the associated variables in the bivariate analysis were

Table 1. Demographic and criminal characteristics of prisoners in the state of São Paulo (n = 1,809).

Characteristics		Men		Women	
		N	%	N	%
Race	White	610	51.2	223	36.1
	Black	227	19.0	182	29.5
	Brown	349	29.3	210	34.1
	Other	6	0.5	2	0.3
Place of birth	São Paulo	887	74.4	424	68.7
	Other state	305	25.6	193	31.3
Age(years)	18–27	581	48.7	234	38
	28–37	381	32.0	222	36
	38–47	159	13.3	111	18
	48–57	56	4.7	39	6
	> 57	15	1.3	11	2
Marital status	Partner	709	59.5	259	41.9
	No Partner	483	40.5	358	58.1
Employment before incarceration	Yes	932	78.2	377	61.1
	No	260	21.8	240	38.9
Type of prison unit	Penitentiary	676	56.7	521	84.4
	Provisional Detention Center	516	43.3	96	15.6
History of adolescent delinquency	Yes	201	16.9	59	9.6
	No	991	83.1	558	90.4
Repeat offender	Yes	486	40.8	148	24.0
	No	706	59.2	469	76.0
Time served	≤ 1 year	496	41.6	123	19.9
	> 1 year	696	58.4	494	80.1
Type of crime	Drug crime	104	8.7	161	26.1
	Violent crime	822	69	349	56.6
	Crime against property	266	22.3	107	17.3
Lack of discipline in prison	Yes	192	16.1	125	20.1
	No	1000	83.9	493	79.9
Physical health problems	Yes	345	28.9	257	41.7
	No	849	71.1	360	58.3

a history of juvenile delinquency and repeat offender, which remained associated in the multiple analysis.

The variables related to depression in the bivariate analysis among the women (Table 3) were: physical health problems, drug crime, being a repeat offender and lack of discipline. The variable “lack of discipline” lost its significance in the multiple

Table 2. Factors associated with depression and other mental disorders in prisoners in the state of São Paulo (n = 1,192).

Reference category	Variables	Prevalence (%)	Bivariate Analysis		Multiple Analysis	
			OR	CI95%	OR	CI95%
Have depression	Have an infringement history in adolescence	16,8	2.1	1.3 – 3.5	2.1	1.2 – 3.5
	Have a partner	40,5	1.7	1.1 – 2.5	1.6	1.0 – 2.4
	Committed a drug crime	9,8	1.8	0.9 – 3.5	1.9	0.9 – 3.9
	Committed a violent crime	67,5	0.7	0.4 – 1.1	0.9	0.6 – 1.5
	Be a repeat offender	59,2	1.6	1.1 – 2.39	1.4	0.9 – 2.2
	Lack of discipline	83,8	1.4	0.8 – 2.2	1.6	1.0 – 2.8
	Be up to one year in prison	58,4	1.6	1.1 – 2.3	1.2	0.7 – 1.9
	Prisoner in a prison	50,0	0.6	0.4 – 0.8	0.6	0.4 – 1.0
Having other mental disorders	Physical health problems*	20,9	1.5	1.0 – 2.2	1.5	1.0 – 2.3
	Have a criminal history in adolescence	20,3	1.9	1.3 – 2.7	1.8	1.2 – 2.6
	Have a partner	57,5	1.0	0.7 – 1.2	0.9	0.7 – 1.2
	Committed drug crime	10,8	1.3	0.8 – 2.2	1.4	0.8 – 2.5
	Committed violent crime	65,1	0.7	0.5 – 1.0	0.8	0.6 – 1.2
	Be a repeat offender	46,5	1.8	1.3 – 2.3	1.5	1.2 – 2.1
	Lack of discipline	16,4	1.0	0.7 – 1.5	1.0	0.7 – 1.5
	Up to one year in prison	42,7	1.2	0.9 – 1.5	1.0	0.7 – 1.5
	Prisoner in a prison	55,6	0.7	0.5 – 1.0	0.8	0.5 – 1.1
	Physical health problems*	17,7	1.2	0.8 – 1.7	1.1	0.8 – 1.6

OR: odds ratio; 95% CI: 95% confidence interval; *clinical (eg gastric, orthopedic, skin, respiratory and headache) and infectious diseases (human immunodeficiency virus - HIV, tuberculosis, hepatitis and venereal disease). Categories of the dependent variable: having depression, having other mental disorders and not having mental disorder (reference category). Reference categories: no health problem; not to be a repeat offender; violent crimes; without disciplinary issues; have no infringement history during adolescence; No partner.

model, while the variables “being imprisoned” and “violent crime” were positively associated. In the bivariate analysis, other mental disorders were associated with physical health problems, being a repeat offender and history of juvenile delinquency. In the multiple analysis, the same variables had an association, and violent crime had a positive association.

Table 3. Factors associated with depression and other mental disorders in women prisoners in the state of São Paulo (n = 617).

Reference category	Variable	Prevalence (%)	Univariate Analysis		Multiple Analysis	
			OR	CI95%	OR	CI95%
Have depression	Have physical health problems	31.5	2.2	1.5 – 3.1	3.0	1.8 – 5.1
	Prisoner in a penitentiary	88.9	1.3	0.9 – 1.7	2.1	1.0 – 4.2
	Have a partner	47.9	1.1	0.9 – 1.5	1.5	0.9 – 2.4
	Committed a drug crime	31.7	2.2	1.4 – 3.4	2.4	1.1 – 5.0
	Committed a violent crime	51.9	0.8	0.6 – 1.2	1.9	1.0 – 3.7
	Be a repeat offender	27.5	1.3	1.0 – 1.8	2.0	1.0 – 3.8
	Have lack of discipline	22.3	1.5	1.1 – 2.2	1.4	0.7 – 2.8
	Have an infringement history in adolescence	9	3.1	1.0 – 9.6	2.2	0.6 – 7.2
Have other mental disorders	Have physical health problems*	24.6	1.4	1.0 – 1.9	1.9	1.2 – 3.2
	Prisoner in a penitentiary	85.4	1.0	0.8 – 1.2	1.2	0.6 – 2.2
	Have a partner	39.5	0.9	0.7 – 1.1	1.0	0.6 – 1.6
	Committed a drug crime	22.2	1.2	0.8 – 1.8	1.8	0.9 – 3.7
	Committed a violent crime	62.5	0.9	0.7 – 1.2	2.4	1.3 – 4.5
	Be a repeat offender	26.1	1.6	1.3 – 2.0	1.8	1.0 – 3.5
	Have lack of discipline	22.6	1.3	0.9 – 1.7	1.4	0.7 – 2.7
	Have a criminal history in adolescence	13.4	4.9	1.7 – 14.2	3.4	1.1 – 10.4

OR: odds ratio; 95% CI: 95% confidence interval; *clinical (e.g gastric, orthopedic, skin, respiratory, and headache) and infectious (human immunodeficiency virus - HIV, tuberculosis, hepatitis, and venereal disease) problems. Categories of the dependent variable: having depression, having other mental disorders and not having mental disorder (reference category). Reference categories: no health problem; not to be a repeat offender; violent crimes; without disciplinary issues; have no infringement history during adolescence; No partner

DISCUSSION

The prison population presented worrying prevalences for depression and confirmed the literature data regarding the greater morbidity among women compared to men^{2,18,19}. Depression in men has been more associated with factors related to disciplinary issues in the prison, having a history of juvenile delinquency and being a repeat offender. Women with depression, in turn, were more likely to have physical health problems, commit crime against property or violent crime, and be imprisoned in a penitentiary.

The prevalences found in the male and female populations were similar to those identified in American penitentiaries (17.4% in men and 35.5% in women)²⁰. Prevalences among women appear to be more divergent among studies. Our investigation found a prevalence greater than the range of 13% to 24% reported by Binswanger et al.²⁰ and slightly higher than the study performed in penitentiaries in the United States (28%)²¹. On the other hand, it was lower than the 62% found in a study in Mexico¹⁰. The reason for this divergence is unclear, but it is likely to be related to differences in study methodology, such as the choice of diagnostic instrument and participant selection procedures²².

Despite these differences, in general, studies show that women present higher prevalences²³, at least twice as prevalent among men^{5,20}. The exception was a meta-analysis of 81 studies (33,588 prisoners from 24 countries) that found no significant difference between the sexes (women 14.1% - CI 10.2 - 18.1, men 10.2% CI 8.8 - 11.7). This study, however, considered one of the methodological criteria of the systematic review, six months as a time reference for the outcome, while the other studies, as well as ours, took into account the calculated diagnosis for life. Such difference may have influenced the divergence between the results.

Regarding the clinical and criminal profile of men and women with depression, the results lead to a discussion based on the so-called sex roles theory, which states that men and women experience depression differently. While women in general tend to emphasize the expressive side, turning to intrapersonality, men are often instrumental and have behavioral problems. Such specificities seem to be related to cultural factors, since women are expected to be more sensitive and emotion and men are expected to be more rational¹¹.

Depression among men was associated with a lack of discipline in the prison, a factor linked to a behavioral profile. Men with depression tend to be more irritable, aggressive, engage in interpersonal conflicts and risky activities, and have high prevalence of comorbidity with alcohol use disorder, which also contributes to behavioral problems²⁵. These behavioral changes tend to make it difficult to adapt to the prison's disciplinary system and tend to lead to revictimization when faced with repressive and punitive actions, which may aggravate the psychiatric situation and hinder the process of social rehabilitation after release¹¹. Attention is drawn to the lack of association between prison discipline and other mental disorders in our study, which further

reinforces the understanding of the potential maladaptation that depression tends to generate in prisoners.

If men externalize depression, women often manifest it with psychological and cognitive changes. They usually present rumination. They tend to exacerbate stressors as major obstacles and take a negative stance on situations and the future^{10,11}. Such cognitive pattern tends to affect the health of women, due to the greater risk of psychosomatic diseases²⁶. Studies show that women prisoners are more vulnerable to health problems among women prisoners with mental disorders compared to prisoners without mental disorder²⁰. Our study showed association of physical health problems with depression and with other mental disorders among women. This association was twice as high among women with depression than among men with the same psychiatric condition. The association was not significant among men with other mental disorders, suggesting a greater comorbidity between physical and mental health problems among women when compared with men.

The female prison population also tends to present a greater psychological impairment than men, due to a history of (re) victimization^{27,28}. Victimization tends to occur either in childhood, because of part of the parents or guardians, or as adults, due husbands or partners^{29,30}.

Following the perspective of further weakening the psychological and emotional state of the prisoner with mental disorders, it is possible to understand the association of violent crime with depression and with other mental disorders in women in our study. Although women in general do not present a violent profile, dangerousness becomes more significant when there is psychiatric morbidity³¹. Thus, the female population of our study presented high psychiatric morbidity, especially with comorbidities, as can be seen in a previous publication³.

Regarding the association between drug crime and depression, it is not possible to reach a definitive conclusion, however, our results lead to the hypothesis that women with depression are more vulnerable to being persuaded and manipulated by partners, and have fewer psychological resources to obtain other types of work activity³². Thus, crime is an alternative to providing for their children²⁸. The association between depression and reoffending only among women is not clear, but it is suggested that it can be understood in the context of vulnerability and poor social adaptation of those who engage in crime, especially those with depression^{28,32}.

Being imprisoned in a penitentiary has been associated with depression in women, unlike other studies whose disorder is associated with CDP due to the abrupt decline in social contact and the exercise of social roles^{8,10,11}. A more in-depth study would be necessary to understand this difference, however, one hypothesis would be the abrupt break in family ties during the sentence in the prison system. Studies show that the isolation of prisoners, represented by the lack of family visits, is a factor directly related to depression^{33,34}. Women prisoners who are mothers may present worsening clinical conditions and emotions such as guilt, despair and frustration³¹.

In spite of the associations found with depression, it is known that this relationship is complex and can not be understood in a linear way³⁵. It is the combination of vulnerability factors together with the individual's exposure to stressors that allows the understanding of the development or aggravation of a psychiatric condition³⁶, and this involves other aspects that were not contemplated in this study.

Understanding the profile of men and women with depression in the prison system contributes to the identification of demands in terms of treatment (penal and clinical) and rehabilitation (clinical and social). Gender specificities present specific demands in terms of the treatment of depression and social rehabilitation that should be considered in health policies of the prison system¹⁸.

Taking into account the high prevalence of depression among women, especially among those in prisons, there are some alternatives to deprivation of freedom⁸. Restorative justice and alternative sentences are options that allow better re-socialization with the maintenance of family ties, which is crucial for both women and children³⁷. In resocialization programs, one must still think about the existence of social support and psychological treatment to deal with the trauma of victimization. For more serious cases of crime, where deprivation of freedom is necessary, the maintenance of family ties, especially with children, through family visits is essential for resocialization and mental health^{31,38}.

There are barriers to the treatment of prisoners with depression, especially for men, since they do not usually seek health services. This is because they tend to hide emotional issues because of the stigma of weakness and the femininity associated with it¹⁰. One possible strategy to increase access to treatment is to train agents to improve the identification of the clinical signs of depression.

In addition, the training of system professionals, especially security professional, is essential so that they acquire behavioral skills to deal with such prisoners and, thus, avoid the revictimization of prisoners with adaptation difficulties due to lack of discipline. In terms of treating behavioral problems, cognitive behavioral interventions seem to be an effective alternative to increase coping capacity for stressful situations³⁹.

This is the first epidemiological study with an emphasis on large-scale depression in the state of São Paulo, whose prison population corresponds to about 40% of prisoners in the country¹³. In addition to the appropriate methodology for the complexity of the sample, the study stands out by evaluating the clinical and criminal profile of men and women with depression.

Despite its relevance, the study is limited:

- the occurrence of rebellions, a few months before the beginning of the interviews, throughout the prison system, which made access to selected individuals difficult;
- the voluntary participation of prisoners, after having been randomly selected, may have generated a certain selection bias, since badly adapted and aggressive prisoners tend to refuse participation;
- possible information bias regarding the symptoms of depression reported by men and women because men tend to hide their emotions while women overestimate them¹¹.

CONCLUSION

This study showed that men and women in the prison system with depression present a specific clinical and criminal profile for each gender, which should be considered when implementing public health and safety programs. Men with depression have behavioral changes that reflect in reoffence, a history of misconduct during adolescence, and lack of discipline in the prison. Depression in women, on the other hand, appears to be associated with greater cognitive and psychological impairment associated with involvement in drug offenses and more serious crimes. In addition, depression in women is a risk factor for physical health problems.

The present study does not pretend to exhaust the understanding of the factors associated with imprisonment or depression in men and women, and we know the complexity of the phenomena involved. For a deeper understanding of the subject, we recommend the development of longitudinal studies with prisoners during and after prison release, as well as research on the effectiveness of programs aimed at depression and resocialization.

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