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Social Support, Stressful Life Events, Medication - Taking Self - Efficacy, Psychotic Symptoms on Social Dysfunction: Role of Mediating Effects

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Objectives: To test a hypothetical model of psychotic symptoms in persons with schizophrenia and misusing methamphetamines and to test the mediating effects of psychotic symptoms and medication-taking self-efficacy on Social dysfunction.

Methods: In a cross sectional-study, 313 participants from 9 settings were enrolled. A set of five questionnaires were applied, including of the Demographic Data Questionnaire, the Brief Psychiatric Rating Scale, the Self-efficacy for Appropriate Medication Use Scale, the Stressful Life Events Questionnaire, and the Social Dysfunctioning Scale, paralleled with social support questionnaire. Path analysis was used to test the model and hypothesis to predict the mediating effects.

Keywords: *social support, medication taking self-efficacy, social support, social dysfunction, path analysis, psychotic symptoms, schizophrenia, methamphetamine misuse.*

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Results: The model indicated a good fit of the data ($\chi 2 = 114$, df = 92, p-value = 0.057, GFI = 0.96, AGFI = 0.92, CFI = 1.00, RMSEA = 0.028. The path analysis showed that social support, medication-taking self-,and psychotic symptoms had a positive direct effects on social dysfunction in schizophrenia and misused methamphetamines persons. The explanatory variables accounted for 26% of the variance in explaining social dysfunction. Medication self-efficacy had direct effect on psychotic symptoms. Social support had direct effect on medication use self-efficacy. Psychotic symptoms had the largest and a significant direct impact on social dysfunction. Social dysfunction was inducible from the stressful life event, but it could be mediated by efficacy of the treatment.

Conclusions: Psychotic symptoms was the most important predictor for persons with schizophrenia and misused of methamphetamine. The psychotic symptoms are playing a significant role on social dysfunction. Early symptoms detection can guide the nursing intervention, integrated treatment plans, and the supportive social program to reduce patient's social dysfunction and enhance their quality of life.

Keywords: social support, medication taking self-efficacy, social support, social dysfunction, path analysis. psychotic symptoms, schizophrenia, methamphetamine misuse.

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I. Introduction

The global burden of comorbidity attributable to illicit drug uses. Of those 247 million illicit substances users, at least one in 2014, 29 million suffers from drug used disorders (1). People who suffer from drug used disorders or people with drug use disorders were a subset of population who use drugs and need treatment, health and social care, and rehabilitation. Methamphetamine use mimic schizophrenia and it is estimated that 30% within 8 years of those users will be diagnosed with a stimulant-induced psychosis and will be re-diagnosed with schizophrenia that psychotic symptoms was play a vital role. Additionally, methamphetamine use is associated with poorer social dysfunctioning and prognosis in persons with primary psychotic disorders, such as schizophrenia spectrum disorder (2-3).With this regards, it is a need to discover what factors related to psychotic relapse among schizophrenic Persons with methamphetamines misused (4-6). Early detection and preventive intervention can be provided to reduce the subsequent risk of transition to schizophrenia and relapsing of schizophrenia in long terms. One direction of identifying which cases are likely to progress to schizophrenia is to examine their symptom patterns, factors influencing, and mediating effects of factors related to psychotic symptoms. Particular positive symptoms such as bizarre thinking have been shown to predict psychosis onset among prodromal / high-risk individuals (6-8).

This type of positive symptoms experienced may be an indicative individual as persons with methamphetamine are more likely at risk of progressing to schizophrenia. Although numerous of empirical studies indicated that, the prevalence of psychotic symptoms in MAP, primarily persecutory delusions and hallucinations (usually visual and auditory), the structure or typologies of psychotic symptoms in MAP has yet to be undertaken. Moreover, 12 million injected drugs users, they are likely high risk of infection: HIV (14%) and

HCV (52%) (7). In addition, global consequences of SUDs are far-reaching to higher rates of comorbidity such as hepatitis and tuberculosis infections, lost productivity, injuries and deaths from automobile and other accidents, as well as deaths from overdose drug used, suicides, and violence (6, 10).

Psychotic relapse prevention for persons with schizophrenia and misusing methamphetamine is becoming an urgent public health needed. However, there are some concerning conflicting ideas, which variables are most important and whether these variables are "direct or indirect" factors, impact on psychotic symptoms (4, 11). Specific predicting factor for this hypothetical model could not easily be extracted from the result of empirical research. This study is, therefore, exploratory.

There were numbers of evidence based studies to examine antecedents of psychotic symptoms (4, 7, 12, 13), but little is known about relationships in these factors, for example, social support, stressful life events, medication used self-efficacy, and what psychotic symptoms play as the mediating role effected on social dysfunction that deteriorated on the severity of psychotic symptoms. Design suitable intervention program and extensively program used as psychiatric and mental health nursing is the important issue to prevent relapse and being a positive influences on nursing outcomes and multidisciplinary treatment teams outcomes.

Considering varies variables, we attempted to identify the associated factors with psychotic symptoms among schizophrenia and misusing methamphetamines users by creating a path model. Both direct and indirect factors were included in the study. The initial hypotheses of the study included: (a) whether psychotic symptoms would be the most powerful direct predictor social dysfunction of in persons with schizophrenia, misusing methamphetamines: (b) could psychotic symptoms and medication-taking self-efficacy mediate social dysfunction.

The results of this exploratory study could generate insight understanding in the existence of different diurnal fluctuations or deviant within-subject relationships between medications used self-efficacy and psychotic symptoms. These results may also provide further knowledge on the within-subject relationship between social dysfunction and stressful life events versus social support of the stress and physiological systems.

II. Purpose

To test a hypothetical model of psychotic symptoms in persons with schizophrenia and misusing methamphetamines and to test the mediating effects of psychotic symptoms and medication-taking self-efficacy on Social dysfunction.

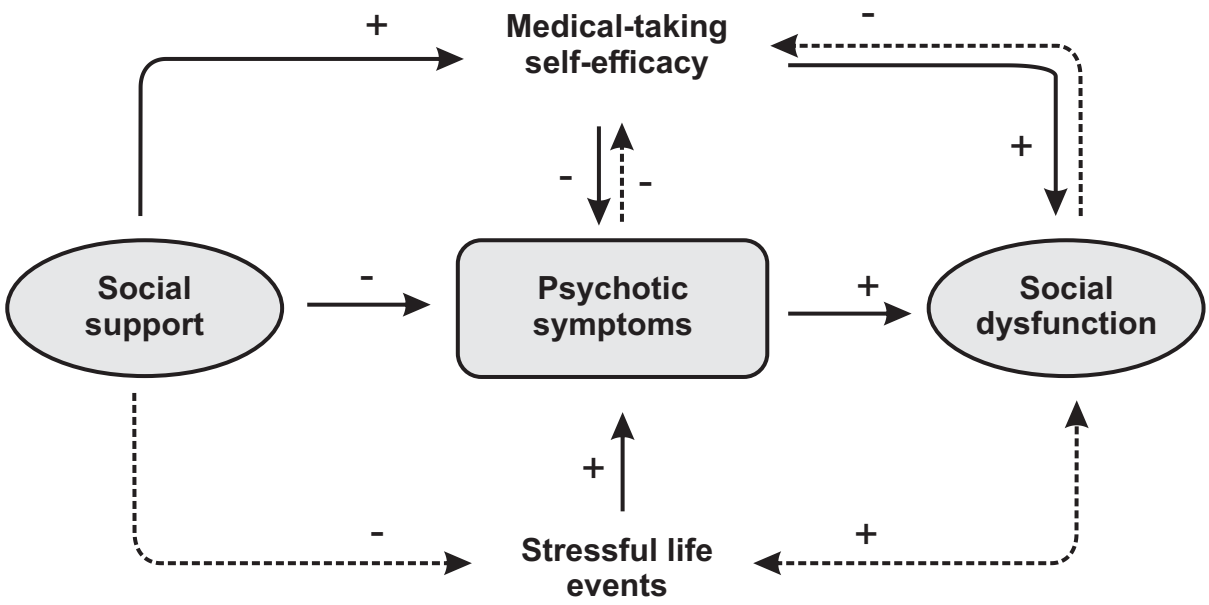

Diagram 1: Association of Medication, Social Events, Social Support and Social Dysfunction

III. Methods

The cross-sectional study was conducted during April to May 2015 at the psychiatric hospital and Institute on Drug Abuse Treatment, Thailand.The Ethics Review Committee for Research Involving Human Research Participants, Health Science Group, Chulalongkorn University (COA approved this study.No. 053/2558). The risk and benefits of participation were explained to the participants. Written consent forms were obtained directly from participants before data collection. Participation was voluntary, and anonymity. Confidentiality of participation were guaranteed. Data collection were based on questionnaires.

a) Measures:

1. The Brief Psychiatric Rating Scale (BPRS) (15) use to measure psychiatric symptoms, a semi-structured interview with an 18-item rating scale based on patient observations and verbal reports. The total scale score ranges from 18- to 126, from "not present" to "extremely severe." The BPRS exhibited reliability = 0.98 and intra class correlation coefficient = 0.88 (13).
2. The Self-Efficacy for Appropriate Medication Use Scale(16) with 13 items was in two dimensions: the first was self-efficacy for taking medications under difficult circumstances, and the second self-efficacy for continuing to take medications when circumstances of taking medication are uncertain. The Likert scale ranged from not confident to very confident. Scores ranged from 13 to 39. The SEAM showed Cronbach's alpha = 0.91, item-total correlations ranging from--0.07 to 0.62, and test retest = 0.97.
3. Thai Stressful Life Events Rating Scale (TSLERS) (17). The TSLERS is a self-report with two constructs, including self-perceived frequency and intensity of stressful life events. The TSLEQ consisted of 46 items on a 6-point Likert scale, ranging from "never" to "very severe." The 11 domains covered home life, financial problems, social relations, personal conflicts, job conflicts, educational concerns, job security, loss and separation, sexual life, daily life, and health concerns. In the validity of the barriers using seven content experts, the CVI was 1.0, Cronbach's alpha = 0.97, item-total correlations ranged from 0.27 to 0.92, and test retest = 1.00.
4. Social Support Questionnaire (SSQ) (18) consisted of two parts designed to measure informational, emotional, and tangible support. The questionnaire consisted of seven items on three resources of support: one for information support, four for emotional support, and two for tangible support. SSQ was rated on the Likert scale ranging from "not at all" to "a great deal." Scores for three types of support from all sources were added to produce a total social support score. SSQ showed Cronbach's alpha = 0.93, item-total correlations ranged from 0.38 to 0.67, and test retest = 0.95.
5. The Thai Social Dysfunctioning Rating Scale (TSDRS) (19). The SOFS is an observer rating scale comprised of two main components:
   i. The ability to look after oneself and maintain daily activities.
   ii. The instrumental and social skills to manage oneself and live in the community.

Each item is rated on a 5-point Likert scale ranging from "no impairment" to "extreme impairment." The measurement showed CVI = 1.00, construct reliability = 0.99, Cronbach's alpha = 0.93, item-total correlations ranging from 0.30 to 0.70, and test retest = 0.96.

IV. Statistical Analysis

Path analysis was developed: it was used to assess and to compare the fit of the models as three steps below:

1. Confirmatory factor analysis was conducted by estimated using maximum likelihood (ML) with two latent variables (psychotic symptoms and medication-taking self-efficacy) to test the modelfit and constructing the full path model then. The model fit was evaluated using Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Standardized Root Mean Square Residual (SRMR) because the $\chi 2$ statistic is sensitive to a large sample size.
2. An SEM path analysis estimated using ML that identified latent and observed variables while covarying for age and gender was conducted. Two latent variables using the psychotic symptoms and medication-taking self-efficacy were defined as indicators by fixing the loading of thefirst parcel in each factor to 1. The social support and stressful life events subscale scores were included as observed variables. Pathways from social support and stressful life events to the medication-taking self-efficacy and psychotic symptoms to social dysfunction were examined in a cross-sectional model.
3. SEM moderation analyses estimated with ML was conducted. Variables as described above were defined. In present model, the medication-taking self-efficacy and psychotic symptoms was considered as a moderator in the relationship between social support and stressful life events on social dysfunction.

V. Results

Persons who met the inclusion criteria (n = 313) were enrolled in the study. All of them had have experiences of psychotic symptoms. Predominately subjects were male (87.9%), from high-school (27.8), being single (66.8%) and employment (28.4%). The mean age was 25 years old. From the first time of diagnosis of schizophrenia, a number of seeking care admitted, duration of having psychiatric illness were 2-10 years, 2-5 times, and 1-5 years, respectively. No physical illness, but most of them had psychiatric illness (70%). Regarding patient's medical history, nearly half of them (47.0%) had duration of psychiatric illness from 1-5 years. Over two-thirds of them were treated with antipsychotic drugs (73.2%) and group therapy (87.2%). Nearly half participants consumed 2 to 5 tablets of

methamphetamine daily (48.2%). The primary route of methamphetamine usage was smoking (91.1%), and more than half of the Persons (62.3%) have concurrently smoked cigarettes. They were under antipsychotic drugs (73%), with antipsychotic drug (23%) and experienced group therapy (87%) (Table 1).

Table 1: Demographic Characteristics of Schizophrenic Patient and Misusing Methamphetamines (n = 313)

Characteristics	Number	Percentage
Age (Years)		
19 – 30	143	46.3
31 – 40	126	40.3
41 – 50	38	12.1
51 – 60	4	1.3
Gender		
Male	275	87.9
Female	38	12.1
Marital Status		
Single	209	66.8
Marriage	54	17.3
Widowed	10	3.2
Divorced	15	4.8
Separated	25	8.0
Education		
None	14	4.5
Primary / Elementary Education	12	3.8
Secondary Education	73	23.3
High School	87	27.8
Diploma / Certificate	86	27.5
Bachelor's Degree or Higher	20	6.4
Occupation		
Government Official	15	4.8
Employee	89	28.4
Business Person	64	20.4
Agriculturist	71	22.7
Unemployed	73	23.3
Housewife	1	0.3
Number of Admitted		
2 - 5 Times	261	83.4
6 - 10 Times	39	12.5
> 10 Times	13	4.2
Duration of having Psychiatric Illness		
< 1 Years	80	25.6
1 - 5 Years	147	47.0
6 - 10 Years	33	10.5
11 - 15 Years	33	10.5
15 - 20 Years	15	4.8
> 20 Years	5	1.6
Physical Illness		
None	276	88.3
Gastritis	10	3.3
Hypertension	5	1.7
Asthma	3	1.0
HIV	2	0.6
Thalassemia	2	0.6
Migraine	1	0.3
Renal Failure	1	0.3
Hyperthyroid	1	0.3
Hypercholesterol	1	0.3
Gastritis and Asthma	1	0.3
Gastritis and Hypertension	4	1.2
Hypertension and Renal Failure	2	0.6

Diabetes Mellitus, Hypercholesterol, and Hypertension	2	0.6
Smoking Status		
No	2	0.6
Ex-Smoking	116	37.1
Smoking	195	62.3
Treatment		
Pharmacotherapy		
None	3	1.0
Antipsychotic Drugs	229	73.2
Antidepressant	1	0.3
Anxiolytic Drugs		
Antipsychotic Drug and Antidepressant	72	23.0
Antipsychotic Drug, Antidepressant, and Bupropion HCl	4	1.3
Antipsychotic Drugs and Propylthiouracil	1	0.3
Antipsychotic Drugs and Antipsychotic Drugs and	1	0.3
Antipsychotic Drugs and AZT	2	0.6
Group Therapy	273	87.2
ECT	11	3.5

Major social support was family. There was the relationship of patient's stressful life events associated such as job conflicts, sexual life, education concerns, social relations, daily life, and personal conflicts, respectively (Table 2)

Table 2: The Relationship of Observed Variables and Attributable (Loading Factors, Standard Error, T-Test, Lambda-X, and Square Multiple Correlation)

Observed Variables	Loading	SE	T	λ	R2
Social Support					
Family	6.09	0.47	12.84	0.78	0.61
Healthcare Team	5.20	0.43	12.13	0.69	0.48
Neighbors and Friend	3.51	0.48	7.27	0.42	0.18
Stressful Life Event					
Home Life	5.23	0.48	10.80	0.56	0.32
Financial Problems	5.15	0.34	15.04	0.74	0.55
Social Relations	5.15	0.28	18.64	0.86	0.74
Personal Conflicts	5.43	0.35	15.55	0.79	0.62
Job Conflicts	4.69	0.25	18.77	0.87	0.76
Educational Concerns	4.74	0.25	19.06	0.87	0.75
Job Security	5.61	0.33	16.78	0.80	0.64
Loss And Separation	5.08	0.29	17.79	0.83	0.69
Sexual Life	4.50	0.24	18.81	0.87	0.76
Daily Life	4.62	0.25	18.70	0.86	0.73
Health Concerns	2.25	0.14	16.49	0.79	0.62
Psychotic Symptoms					
Positive Psychotic Symptoms	0.22	-	-	0.63	0.40
Negative Psychotic Symptoms	0.16	0.05	3.37	0.47	0.22
Affective Psychotic Symptoms	0.09	0.06	1.47	0.12	0.01

Social support had significant direct effect from medication-taking self-efficacy, but indirect effects from psychotic symptoms and social dysfunction. Persons had significant stressful life event associated with social dysfunction. For self-efficacy in taking medication, psychotic symptoms and social dysfunction were associated (Table 3).

Table 3: Total Effect (TE) Direct Effect (DE) and Indirect Effect (IE) of Factors Influencing Social Dysfunction

Independent Variable	Dependent Variables								
	Medication use Self-Efficacy			Psychotic Symptoms			Social Dysfunction		
	DI	IE	TE	DI	IE	TE	DI	IE	TE
Social Support	2.33**	-	2.33**	-	-0.09*	-0.09*		-0.56*	-0.56*
	(0.56)		(0.56)		(0.04)	(0.04)		(0.23)	(0.23)
	0.36		0.36		-0.09	-0.09		-0.06	-0.06
Stressful Life Event	0.02	-	0.02	-	0.00	0.00	2.72**	-0.01	2.71**
	(0.43)		(0.43)		(0.02)	(0.02)	(0.52)	(0.10)	(0.53)
	0.00		0.00		0.00	0.00	0.29	0.00	0.29
Medication Self-Efficacy				-0.04**	-	-0.04**	-	-0.24**	-0.24**
				(0.01)		(0.01)		(0.07)	(0.07)
				-0.25		-0.25		-0.17	-0.17
Psychotic Symptoms							6.21*	-	6.21*
							(2.39)		(2.39)
							0.67		0.67
R^2	0.13			0.07			0.10		
$\chi 2$ = 114, df = 92, p-value = 0.055, GFI = 0.96, AGFI = 0.92, CFI = 1.00 , RMSEA = 0.028									

Note * $p < 0.05$, ** $p < 0.01$

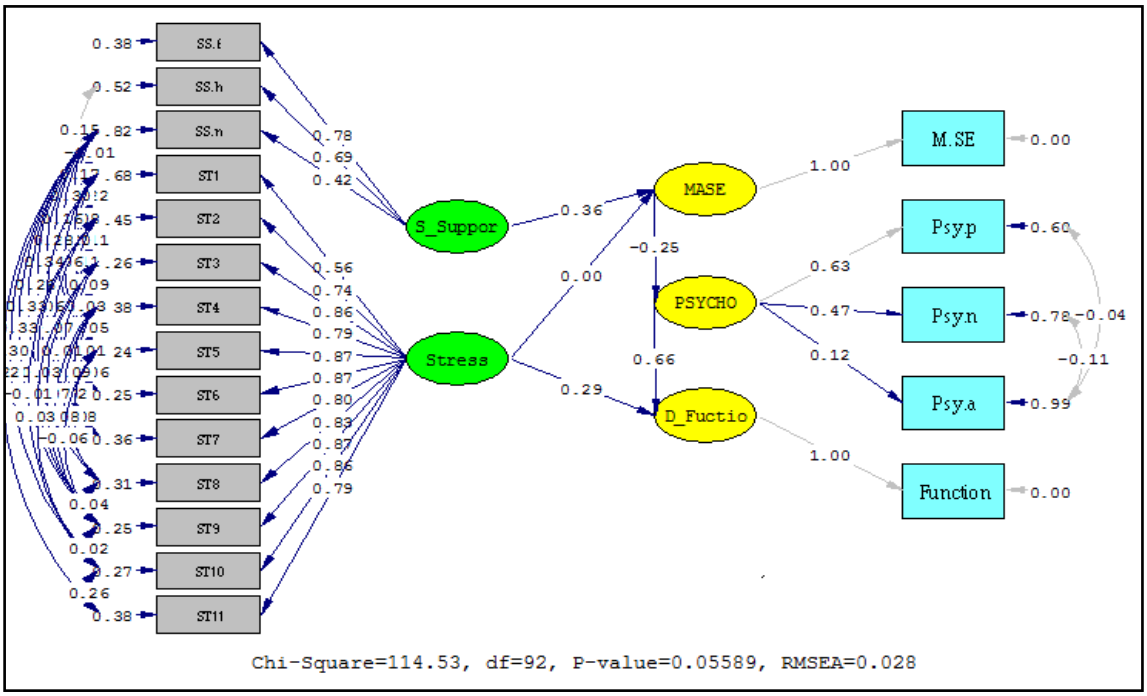

Fig. 1: A Path Analysis of Psychotic Symptoms among Schizophrenic Persons with Misusing Methamphetamines

A path analysis of psychotic symptoms among schizophrenic persons was developed and verified. The model indicated a good fit of the data (X2 = 114, df = 92, p-value = 0.056, GFI = 0.96, AGFI = 0.92, CFI= 1.00, RMSEA = 0.028. We found that psychotic symptoms had positive direct effects on problem focused coping, expressed emotion, social support, and medication-taking self-efficacy. There was 26% of the variance to explain the psychotic symptoms. Social support, especially, family had direct effect on medication-taking self-efficacy. Medication self-efficacy had direct effect on psychotic symptoms. The association of the treatment efficacy mediated on social dysfunction. Stressful life event was also attributable direct effect on social dysfunction (as showed in diagram 1)

VI. Discussion

The depicted finding indicated that social support had direct effect on increasing of medication-taking self-efficacy. In addition, medication-taking self-efficacy had direct associated effect on psychotic

symptoms with the decrease in psychotic symptoms. Both associations are mediated on social dysfunction.

Stressful life events have possibility of indirect effect on social dysfunction through medication-taking self-efficacy and psychotic symptoms. It could explain that the participants encountered with the severe stress in their life that uncope and they choose to misused of methamphetamine to dealing with the stress that can excerbate psychotic symptoms if they use in high level and leading to poor social functioning. However, their self-efficacy in taking antipsychotic drugs would be a strong predictor and may decrease of both positive and negative psychotic symptoms, particularly social withdrawal and social dysfunction in schizophrenia due to the balance neurotransmitters (20-22). In contrast, stressful life events can destroy the medication-taking self-efficacy, if they had in effective coping with the stress or loss of social support. Similarly, to previous study, persons with psychotic symptoms can exacerbate and relapse influenced social dysfunction based on the principles of self-efficacy to increase the ability to look after themselves and manage diary physical activities: and to manage the stressful of social life events(10, 26). In another way, social support can improve social dysfunction by family member or significant other by support persons with schizophrenia and methamphetamine misuse to continuing taking medicine as doctor prescribe to decrease psychotic symptoms that help them to improve brain function in terms of cognitive , emotional, and behavior. This improvement will be positive effect on their activities function such as they can work, engage in the community activities, or perform their activities as usual.All of this is the improvement on the terms of social dysfunction (17).

The present study supports and extends previous findings that using methamphetamines significantly decreases the binding of dopamine and dopamine transporters in the striatum, a brain area that is important for both of memory and movement. Additionally, biological stressors can make individual non-medication adherents. Importantly, this behavior is the result of dopaminergic stressor that leads to the changes of cognitive function (poor judgment, loss of insight, disorganization, and paranoia) (27-29). Therefore, medication use and self-efficacy can decreased psychotic symptoms and social dysfunction might due to the balancing of psychotropic drug use (11, 23, 30-31) that effect on neurotransmitter to improve brain function and enhance their social function (10, 20, 22).

Interestingly, the moderation effects tested in the present study indicate that the social dysfunction is moderated by both medication use self-efficacy and psychotic symptoms was significantly positive at high levels. However, in the part of psychotic symptoms, this study aligns with previous research indicating that illicit methamphetamine use can precipitate and exacerbate positive symptoms in schizophrenia. Schizophrenic dopamine hypothesis describe that over activity of dopaminergic neurotransmission in mesolimbic pathways results in positive psychotic symptoms of schizophrenia. Methamphetamine use also induces the release of dopamine and can result in dopaminergic sensitization in chronic users: this occurs when excessive stimulation of the dopamine system increases hyper-reactivity to further pharmacological or environmental dopaminergic triggers such as stressful life events. This positive feedback mechanism prompts cumulative dopamine dysfunction in individuals with schizophrenia. Higher rates of racing thoughts in past-year users may be attributable to the direct acute effects of amphetamine intoxication, which are widely observed in individuals without a history of psychotic disorders and influence social dysfunction (17, 32-36).

VII. Conclusions

Social support had direct effect on medication-taking self-efficacy and stressful life events. Both of actions had direct and indirect effects on social dysfunction, respectively. The actions need an effective treatment plans awareness with the involvement from family and social support to all eviate patient's social dysfunction. They need more stress management skills, social support and they have to continue taking medicine in order to improve social dysfunction and decrease psychotic symptoms.

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Conflicts of Interest:
None.

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