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YABA, THE CRAZY DRUG AND ITS SOCIAL IMPACT IN BANGLADESH -AN INFORMATIVE REVIEW

Khurshid Jahan^{1*}, Kazi Azajul Ferdoush², Md. Mizanur Rahman³, Zubayer Ahmed⁴ and Saidul Islam Khan⁵

¹Senior Lecturer, Department of Pharmacy, World University of Bangladesh, Dhaka, Bangladesh.

²Resident, Department of Cardiology, Bangabandhu She

ikh Mujib Medical University (BSMMU), Dhaka, Bangladesh.

³Assistant Professor, Department of Physiology, Enam Medical College, savar, Dhaka, Bangladesh.

⁴Clinical Assistant, Efficient Medical Care Pc 170-09 Hillside Ave, Jamaica, NY 11432.

⁵Assistant Professor, Department of Physiology, International Medical College, Tongi, Gazipur, Dhaka, Bangladesh.

*Corresponding Author: Khurshid Jahan

Senior Lecturer, Department of Pharmacy, World University of Bangladesh, Dhaka, Bangladesh.

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ABSTRACT

Drug addiction is very common in Bangladesh and is responsible for social crime. The young generation who are the future of the nation are affected by drug addiction for many reasons. Yaba is an addictive mixture of methamphetamine and caffeine, the drug is available in colorful tablet form, taken orally or inhaled after being melted. It creates hallucinogenic effect which enable the users to stay awake for days. The drug increases the concentration of dopamine in the brain and thus involved in movement, motivation. Now a days it targets the young generation and students of College and Universities, and they are interested to take yaba for entertainment, curiosity, insisting of friends and many more reasons. Yaba addiction influencing young generation to get involve in anti- social activities and crimes like hijack, stealing, even murder as small crime encourage to occur big serious crime and thus the addiction is ruining social values, family bonding, parent child relationship and academic activities of our future generation. The objective of this review was to study the health effects and social impacts of yaba in Bangladesh that can help the government, non-government organizations and policy maker to take proper steps to prevent yaba addiction from the society. Long term use of the drug may cause organ damage of the populations.

KEYWORDS: Drug addiction, Yaba, Methamphetamin, Dopamine, Opioids, Bangladesh.

INTRODUCTION

Drug addiction is very common everywhere in Bangladesh. Every segments of the society like home, educational institutions, workplaces, markets, parks, streets both in rural and urban areas of the country are affected by drug addiction. According to the research near about 25 lakh people of our country are drug addicted and 80 percent of them are adolescents and young people of age in between 15 to 30 years.^[1] The addiction usually occurs when anyone become unable to make control the proper use of prescribed drugs or use illegal substances. So when anyone do not make proper use of medicines, they can be dangerous. The habitual taking of addictive substances like, alcohol, marijuana, hallucinogens and opioids usually cause the addiction that sequentially creates dependency. Dependency syndrome is a condition where a person feels a strong need of taking any drug. Dependency vary on several factors like the type of drugs, amount of drugs taken and the person's general health condition. The effects of drug addiction and dependency have a profound impact in the society and have impact on almost every organ in the

human body. Any types of drug addiction is superintend for all types of social crime. It is a very serious issue for our country now a days.

Common side effects of drug addiction

Weakening immune system is the main reason of infection and all types of illness. Common side effects of drug addiction include -heart attacks and collapsed veins and blood vessel infections from injected drugs, significant liver damage, lung disorder, problems with memory that making daily living more difficult and other health problems are some common side effects of drug addiction. ^[2] Inspite of having several health problems, people taking drugs due to various reasons such as to fit in, to escape or relax, to experiment, to grow up, as a solution of living better way etc.

Common abused drugs Tobacco (nicotine)

Nicotine is an addictive stimulant that present in cigarettes and other forms of tobacco. This substance expand the risk of blood pressure, breathing, stroke and

heart rate. Cigarette smoking may cause lung cancer and other lung diseases like chronic bronchitis, leukemia, pneumonia and cataracts. [3]

Heroin

Heroin is an opioid manufactured from morphine and is collected from the various opium poppy plants. Heroin binds to opioid receptors of brain and produce euphoria and feelings of relaxation. Consistent use of heroin changes brain functioning and cause tolerance and dependence. Opioid pain medicines and heroin shows similar effect.^[4]

Inhalants

Inhalants are called dangerous substances because on inhalation they showed mind-altering properties. Usually people never consider them as a drug but continuous handling or using them may produce dependency. Spray paints, cleaning fluids, shoe polish, markers, glues, different solvents, aerosol sprays, gases, and nitrites etc are termed as inhalants. Inhalants are toxic substances which can damage the heart, lungs, kidneys and brain to a healthy person. ^[5]

Alcohol

Alcohol exhaustion can weakens the immune system and damage most of the organ of the body including the heart, liver, brain and pancreas. Alcohol abuse can be minimized by raising awareness among the populations and political commitment, by taking community action, by addressing marketing of alcoholic beverages, by increasing the pricing policy etc. [6] Alcohol, when drunk in large amounts, it can lead to domestic violence, aggressiveness towards partners and other social crime. Heavy alcohol abuse interferes with the sleep cycle also. [7]

Anabolic steroids

Anabolic steroids are the alternative form of the male sex hormone testosterone are usually used by some athletes and body builders to improve their athletic performance or physical appearance. The short term use of these agents do not show any dependency but long term use can affect brain function as it is a hormone. Misuse of the agent may lead to mania, delusions, impaired judgment etc.^[8]

Fentanyl

Fentanyl is a powerful synthetic opioid more potent than morphine. It is used legally specially to treat patients with severe pain or to manage pain after surgery. Overdose of this drug may cause death. [9]

Marijuana

Marijuana is a highly addictive drugs and use of small amount can produce dependency. Data has been suggested that 30% of those who use marijuana may have some degree of marijuana use disorder specially short term memory loss. [10] The other associated disorders are lose of ability to focus and coordination. It

can also enhance heart rate, impairs lung function and increase risk of psychosis in vulnerable people. People started using marijuana before the age of 18 experienced more by marijuana disorder comparing to the adults. [11]

Prescription and over-the-counter medications

When the prescribed drugs are not used as intended they may produce addiction. Commonly misused prescription drugs are depressants (sedatives and tranquilizers), opioids, stimulants etc. Sometimes opioids are prescribed as pain relieving agent and as relaxant. When they are used for non medical purposes, they become dangerous and cause addiction. The side effects may be confusion, constipation, euphoria, nausea, drowsiness and slowed breathing that may lead to hypoxia. People sometimes misuse prescription opioids. Some examples include: taking any medicine in a dose other than prescribed or taking someone else's prescription medicine without consulting any physician. [12] The commonly used Overthe-counter medicines are dextromethorphan which is a cough suppressant, and loperamide an antidiarrheal. Misuse of these drugs may lead addiction. They are often misused by young people. Dextromethorphan when taken in large doses, can cause a depressant and hallucinogenic effect. On the other hand large dose of loperamide or its use in combination with other drugs may provide opioids like effects.[13]

CNS Depressants

When CNS depressants are not used as their prescribed form, they can be an addictive. If these agents are used in combination with other agents that may cause sleepiness, can slow heart rate, breathing which can be fatal. CNS depressants are usually prescribed to treat anxiety, sleep disorders, acute stress but misuse of these medications slow normal brain function. Commonly used CNS depressants are Sedatives and tranquilizers. [14]

Stimulants

Stimulants are considered as a potential agent of abuse and addiction so their use has been subsided. This agent is now prescribed for treating very limited health conditions. Administration of higher dose of stimulants increase the level of dopamine in brain which leads euphoria, feelings of elation. This pleasurable feeling leads the person repetition of another dose of stimulants that lead to addiction. The tendency of frequent administration of the substance indicate its misuse and addiction also. ^[15]

The crazy drug yaba

The crazy drug Yaba is the combination of methamphetamine and caffeine and it is available in the form of colorful tablets. They are produced mainly in Southeast and East Asia and is popular also in Asian communities in the United States. The main component of Yaba is methamphetamine which is a powerful stimulant, stimulate brain and central nervous system. Methamphetamine is a white, bitter-tasting, odorless, crystalline powder and dissolves freely in water or

alcohol. Methamphetamine was discovered in 1893, its two enantiomers are levo- methamphetamine and dextromethamphetamine. The dextrorotary enantiomer of the substance is a powerful psychostimulant comparing to 1methamphetamine. [16] Though both the enantiomers influence dopamine release and act as powerful stimulant. [17] Methamphetamine is rarely prescribed over concerns involving human neurotoxicity and potential for recreational use as an aphrodisiac and euphoriant, among other concerns, as well as the availability of safer substitute drugs with comparable treatment efficacy. Methamphetamine increase the release of dopamine in the brain and thus involved in feeling of pleasure, movement, motivation. It suppress appetite and someone who wants to reduce body weight like to take yaba. Methamphetamin provides someone the ability to stay wake without the feelings of tiredness. [18] Use of this agent also experienced a person with a number of psychological, physiological and neural effects. Over dose may cause acute intoxication, sudden death, where chronic use provide mental disorders and small dose may provide toxic reactions also. It is classified as Schedule II drug that is highly potential agent for abuse and can be prescribed by a doctor for the treatment of attention deficit hyperactivity disorder. Use of methamphetamine causes increased physical activity, decreased appetite, increased wakefulness, respiration, heart rate and blood pressure. It also increased body temperature. [19] Long term use may cause many negative consequences like weight loss, severe dental problems and skin sores. Repeated use of the drug give pleasurable effects. Chronic methamphetamine abuse develop difficulty feeling then withdrawal from methamphetamine occurs and anxiety, depression, fatigue are some of withdrawal symptoms. [20] Methamphetamine use also increase the risk of some infectious diseases like HIV, hepatitis B and hepatitis C. These can be transmitted by using or sharing contaminated drug, injection, equipment and through unsafe sex. [21] Generally, methamphetamine can be taken in several forms like it can be injected, smoked, orally ingested, or snorted. The preferred method of using the drug varies with time. [22] It is a powerful where overdose may cause consequences like death so immediate treatment is required.

Methods of use yaba

According to Mc Fadden et al, 2011, common method of using yaba is oral ingestion. Tablets can be crushed into a powder and mixed with a liquid and then injected. Tablets can also be heated on aluminium foil to produce vapor and then inspired. [23]

Yaba and other addictives

Yaba which is a type of methamphetamine, is manufactured in Myanmar. Then it first widespread popularly in Thailand, now the drug is becoming a serious problem in Bangladesh specially for the young generation. Yaba is more dangerous than other stimulants because a greater percentage of drug remains

unchanged in the body and extend the stimulant effects. People enjoy the effects but the associate adverse effects include: increased distractibility, nausea, dry mouth, tremors, muscle twitching, memory loss, violent behavior, mood disturbances, weight loss, irregular heart rate, increased blood pressure, anxiety, dilated pupils, confusion, severe dental problems, insomnia or wakefulness, intense itching, blurred vision, dizziness. The drug is highly potential for developing tolerance and dependence within a short period of time. The benefits of methamphetamine was to keep soldiers alert and energized to fight long battles, to fight fatigue when sleep is not an option and deadlines were approaching. The drug also helped the soldiers to stabilize themselves by brushing their tooth, and tying their shoes, and not forgetting the red light means to stop instead of wondering how many squirrels live on this street. [24] Drug addiction is not a recent problem in Bangladesh rather it is very common and the rate is increasing day by day. According to Rezvi, 2019, in 2016, the number of drug-addicted people was 46 lakhs in Bangladesh and nearly 2 lakh people were addicted to yaba in the whole country. Among them, approximately 90 thousand were students and they were in the age range of in between 17 to 25. Not only men, near about ten thousand female students were also addicted to yaba. [25]

Symptoms of yaba use

- Sudden and severe weight loss
- Dilated pupils
- Extreme perspiration
- Track marks on the arms
- Burns, particularly on the lips or fingers
- Premature aging of the skin
- Nosebleeds
- Irregular breathing
- Blackened, rotting and broken teeth^[26]

The health effects of yaba

The agent yaba even in small dose can result in many of the same physical effects as those of the other stimulants. The short term effects of the drugs are-

- Hyperthermia
- Decreased appetite
- Rapid respiration
- Euphoria and rush
- Rapid/irregular heartbeat
- Increased activity
- Wakefulness
- Decreased fatigue. [27],[28],[29]

Long term effects of yaba

Heart problems and stroke like pain, abnormal heart rhythm, high blood pressure, sudden cardiac death. When the drug is used with other stimulants like cocaine or alcohol, there will be higher risk of addiction.

- Tooth decay: Yaba addiction causes tooth decay due to having a dry mouth, teeth clenching and grinding, increased consumption of sugary drinks.
- **Parkinson's disease:** a condition that affects the nerves of movement
- Severe weight loss
- Hepatitis
- Social consequences like financial pressures, concentration problems with work, and family violence's. [30]

Withdrawal syndrome of yaba

Withdrawal syndrome can occur within 24 hours of the last dose of methamphetamine. Symptoms include:

- Psychosis
- Unpleasant dreams
- Sleep problems
- Restlessness
- Depression and anxiety
- Poor concentration
- Slow movement
- Fatigue
- Increased appetite. [31]

Chronic yaba users appear to be more psychologically disturbed like intense paranoia, visual and auditory hallucinations, confusion, and violent behavior. Psychotic symptoms can persist for months or years but stop of use by individuals may experience anxiety, depression, aggression, suicidal thoughts which can lead to social crime. [32],[33] Stop using the drug experience anxiety, depression and other health problem. In the 12 months following treatment, the yaba addicts have some difficulties like psychiatric difficulties, legal difficulties, dissatisfaction with their normal life and different family problems. Even after two to five years of treatment, some of the addicts may experience headache and depression. A recent study showed that vaba users experienced anxiety due to higher levels of glucose in the brain. [34],[When parents use yaba or any addicted substances, families are at risk and children are vulnerable in this situation. Drug intoxication and withdrawal can result in reduced ability to care for children and can expose children to violence and different illegal activities. Treatment is important when it is difficult to control use of addicted things, when families become concerned about changes in their behavior, when someone is losing their ability to execute their usual daily works (e.g., work, parenting). [36],[37]

Treatment and prevention for yaba

The crazy drugs yaba that contain methamphetamine, alter brain functions in ways that have important implications for treatment. Treatment may need to be continued for a long period of time for complete improvement. Full recovery may take sufficiently long period of time. Prevention can be carried out by the development of drug addiction preventing plan, creating social awareness, seeking support from the educational

institution by reducing dropout students, reducing availability of supply etc. Increasing cost, ensuring appropriate policies and mechanisms for early detection of addicted person, avoiding workplace practices for using stimulant drugs and coordination of security service and social awareness can play a vital role. A survey was conducted on the yaba addicts and the result revealed that about 79% addicts did not take any treatment to get rid of drug addiction but only 21% took treatment. [38] The most effective treatments for methamphetamine addiction are behavioral therapies. like cognitive-behavioral and motivational incentive that helps in promoting abstinence from drugs. The Matrix Model showed that combines behavioral therapy. individual counseling, family education, 12-step support and encouragement for non-drug-related activities has been shown to be more effective in reducing methamphetamine misuse. [39],[40]

Social impact of vaba

Near about 25 lakh people of Bangladesh are drug addicted and amongst them about 80% addicts are in between the age range of 15 to 30. Usually people of higher class family are affected by vaba. Students of College and Universities are the main target of vaba dealer. At a first glance any addiction affect the users only but day by day it affects the family and then the whole society. There is a close relation between addiction and social crime. The addicts can not maintain their regular life, as a result unemployment is being increased and murder, hijack, suicidal tendency, sexual harassment is increasing. Long term yaba use lead health impairments, anxiety, depression, worklessness tendency. Research showed that family disorganization, parents separation, indiscipline, loss of love, loss of spouse strife, lack of care, curiosity, availability of the drugs, lack of emotional support, conflicts with parents are the major reasons of yaba addiction. The addicts not only involved in antisocial activities but also swallow the lion share of family income to buy their drugs. As a result the family face serious troublesome and face lifetime suffering. The addicts can do any crime even murder. From many more small crimes serious crimes occur. Parents, teachers, family members can play a vital role to protect the victims, they should find out the addicts first by keeping them in close observation. Behavioral change is the major sign to identify the addicts.[41]

CONCLUSION

Yaba does not contain any natural elements. Almost two million tablets are consumed daily in Bangladesh and it is pouring in over the Naf river in Myanmar. According to narcotics officials, evidence was clear that labs situated on the Myanmar-Bangladesh border producing yaba tablets. Yaba use cosidered as a symbol of smartness for the age group of 15-30. The colorful pills bring attention to their mind. This young generation abuse the drug due to frustration, depression, curious mind, family disorganization, distancing from parents,

social isolation, conflicts with parents etc. [42] Combating drug addiction is very difficult. To prevent addiction innovative social, medical and religious aspects must be put in place. Young people abuse drugs due to complex social and family crisis. So both the family and society are needed to involve to prevent yaba addiction from the society. Improving interfamily relationship, family education, maintaining good mental health can protect the society from any addiction. Family, parents, teachers, friends, siblings, spouses may play vital role in controlling all types of addiction. Caffeine, the most widely consumed psychoactive substance in the world, acts as a CNS stimulant but can potentiate the toxic effects of methamphetamine. [43] The drug is harmful to health like the other addiction but lung, liver and kidney are the major organ where methamphetamine is accumulated. [44] Yaba or methamphetamine belongs to the 'stimulant' class of drugs, which also includes amphetamine, and stimulate the brain and central nervous system, resulting in increased alertness and physical activity that's why a group of young population is interested to this agent. Our body has become dependent on yaba as a source of energy, but the addicts also feel weak and depleted during the withdrawal stage. The victims involved many social crimes, can not maintain their normal life, lost their jobs or dropped out from educational institutions. [45] Addiction not only affect a society but also it can ruin a whole family. Campaign against the agent yaba, less availability, developing positive coping skill by counseling and training, encouraging self confidence can provide beneficial role to prevent yaba addiction. Government and some other NGO also involved many activities to prevent the harmful effects of vaba and all types of drug addiction. Recently 'Prothom Alo", the daily newspaper, has started campaign against drug abuse with the help of the youths. They have involved renowned persons of different sectors of the society like-the writers, teachers, singers, magicians and social workers in this campaign. [46] Treatment of yaba is a difficult and long term matter. But the family, teachers friends, parents, spouse, siblings of the victims may play a vital role to combat yaba. Positive coping skills can be developed among youth through training and counselling. Brainstorming on skills and strengths needed to be developed in the individual to successfully cope with the pressure that provides ability to say 'no, developing selfconfidence, self-esteem. Proper recreation, managing time by a qualitiful way, handling situation of depression and frustration, resolving conflict and developing knowledge about social value of health can help the yaba addicts to survive properly.

REFERENCES

- Islam A, Hossain F, Drug abuse and its impact on Bangladesh. *International Journal of Sociology and Anthropology*, 2017; 9(11): 143-156. doi: 10.5897/IJSA
- https://www.gatewayfoundation.org/faqs/effects-of-drug-abuse

- 3. NIDA. Media Guide. National Institute on Drug Abuse website. https://www.drugabuse.gov/publications/mediaguide, 2018; 2.
- https://www.ukat.co.uk/drugs/heroin/symptomssigns
- 5. NIDA. (2018, July 2). Media Guide. https://www.drugabuse.gov/publications/mediaguide on, 2020; 12.
- 6. Strategies to reduce the harmful use of alcohol, WHO, 2008; 20. http://apps.who.int/gb/ebwha/pdf_files/A61/A61_13 -en.pdf
- National Health and Medical Research Councils Australian Guidelines toR Health Risks From Drinking Alcohol. Canberra: NHMRC. https://www.nhmrc.gov.au/aboutus/publications/australian-guidelines-reduce-healthrisks-drinking-alcohol#block-views-block-fileattachments-content-block, 2009.
- 8. NIDA. Anabolic Steroids. https://www.drugabuse.gov/publications/drugfacts/a nabolic-steroids on, 2020; 1.
- Higashikawa Y, Suzuki S, Studies on 1-(2-phenethyl)-4-(N-propionylanilino) piperidine (fentanyl) and its related compounds. VI. Structure-analgesic activity relationship for fentanyl, methyl-substituted fentanyls and other analogues. Forensic Toxicol, 2008; 26(1):1-5. doi:10.1007/s11419-007-0039-1
- 10. Hasin DS, Saha TD, Kerridge BT, et al. Prevalence of Marijuana Use Disorders in the United States Between 2001-2002 and 2012-2013. *JAMA Psychiatry*, 2015; 72(12): 1235-1242. doi:10.1001/jamapsychiatry.2015.1858
- 11. McCaffrey DF, Pacula RL, Han B, Ellickson P, Marjuana Use and High School Dropout: The Influence of Unobservables. Health Econ, 2010; 19(11): 1281-1299. doi: 10.1002/hec.1561
- Cicero TJ, Ellis MS, Kasper ZA, Increased use of heroin as an initiating opioid of abuse. Addict Behav, 2017; 74: 63-66. doi: 10.1016/j.addbeh.2017.05.030. https://www.ncbi.nlm.nih.gov/pubmed/28582659
- 13. NIDA. . Over-the-Counter Medicines. https://www.drugabuse.gov/publications/drugfacts/over-counter-medicines on, 2020; 1.
- 14. Nora Volkow, et al. Dopamine Transporter Occupancies in the Human Brain Induced by Therapeutic Doses of Oral Methylphenidate. *Am J Psychiatry*, 1998; 155: 1325-1331.
- 15. Nash, J.M. Addicted. Time, 1997; 149(18): 69-76.
- 16. Ciccarone D. Stimulant abuse: pharmacology, cocaine, methamphetamine, treatment, attempts at pharmacotherapy. Prim Care, 2011; 38(1): 41–58. doi: 10.1016/j.pop.2010.11.004
- 17. Kuczenski R, Segal DS, Cho AK, Melega W. Hippocampus norepinephrine, caudate dopamine and serotonin, and behavioral responses to the stereoisomers of amphetamine and

- methamphetamine. *J Neurosci*, 1995; 15(2): 1308-17. doi: 10.1523/JNEUROSCI.15-02-01308.1995.
- 18. Hashim S M. The curse of yaba persists, 2017; 25. The Daily Star
- 19. Chomchai C, Chomchai S. Global patterns of methamphetamine use. *Curr Opin Psychiatry*, 2015;
 28 (4): 269-74. doi:10.1097/YCO.0000000000000168
- Courtney KE, Ray LA. Methamphetamine: an update on epidemiology, pharmacology, clinical phenomenology, and treatment literature. Drug Alcohol Depend, 2014; 143: 11-21. doi: 10.1016/j.drugalcdep.2014.08.003
- 21. Diaz S, Smith LM, LaGasse, LL, et al. Effects of Prenatal Methamphetamine Exposure on Behavioral and Cognitive Findings at 7.5 Years of Age. *The Journal of Pediatrics*, 2014; 164: 1333-38. doi: 10.1016/j.jpeds.2014.01.053.
- Chomchai C, Chomchai S. Global patterns of methamphetamine use. *Curr Opin Psychiatry*, 2015; 28(4): 269-74. doi: 10.1097/YCO.0000000000000168
- 23. Mc Fadden LM, Stout KA, Vieira-Brock PL, et al. Methamphetamine self-administration acutely decreases monoaminergic transporter function. *Synapse*, 2012; 66(3): 240-245. doi:10.1002/syn.21506
- 24. 24.15 july 2015https://www.quora.com/Are-there-any-benefits-to-meth.
- 25. Minhazur Rahman Rezvi. Influencing Factors of 'Yaba' Addiction among the Youth of Bangladesh and Its Effect: A Qualitative Study. Asian Research Journal of Arts & Social Sciences, 2019; 9(3): 1-7. Article no.ARJASS.47877 ISSN: 2456-4761. doi: 10.9734/ARJASS/2019/v9i330127
- 26. Petit, A., Karila, L., Chalmin, F., & Lejoyeux, M. Methamphetamine addiction: a review of the literature. *Journal of Addiction Research and Therapy*, 2012. doi:10.4172/2155-6105.S1-006
- Chomchai C, Chomchai S. Global patterns of methamphetamine use. *Curr Opin Psychiatry*, 2015; 28(4): 269-74. doi: 10.1097/YCO.0000000000000168
- Panenka WJ, Procyshyn RM, Lecomte T, et al. Methamphetamine use: A comprehensive review of molecular, preclinical and clinical findings. Drug Alcohol Depend, 2013; 129(3): 167-79. doi: 10.1016/j.drugalcdep.2012.11.016
- Courtney KE, Ray LA. Methamphetamine: an update on epidemiology, pharmacology, clinical phenomenology, and treatment literature. Drug Alcohol Depend, 2014; 143: 11-21. doi: 10.1016/j.drugalcdep.2014.08.003.
- 30. Petit, A., Karila, L., Chalmin, F., & Lejoyeux, M. Methamphetamine addiction: a review of the literature. *Journal of Addiction Research and Therapy*, 2012; 16. doi:10.4172/2155-6105.S1-006
- 31. American Association of Neurology. Using amphetamines may increase risk of Parkinson's disease, 2011.

- from https://www.aan.com/PressRoom/Home/Press Release/904)
- 32. Anglin MD, Burke C, Perrochet B, Stamper E, Dawud-Noursi S. History of the methamphetamine problem. *J Psychoactive Drugs*, 2000; 32(2): 137-141. doi:10.1080/02791072.2000.10400221
- 33. Brecht, M.L, O'Brien, A, Von Mayrhauser, C, and Anglin, M.D. Methamphetamine use behaviors and gender differences. *Addictive Behaviors*, 2004; 29: 89-106.
- 34. Brecht, M.L, O'Brien, A, Von Mayrhauser, C, and Anglin, M.D. Ibid, 2004.
- 35. Anglin, M, Burke, C, Perrochet, B, Stamper, E, and Dawud-Noursi, S. History of the methamphetamine problem. *Journal of Psychoactive Drugs*, 2000; 32(2): 137-141.
- 36. Bishop, S. (1999). Epidemiology and treatment of methamphetamine abuse in California: A regional report. Los Angeles, CA: National Evaluation and Technical Assistance Center. Retrieved, 2006; 17. http://www.hawaii.edu/hivandaids/Epidemiology%2 Oand%20Treatment%20of%20Meth amphetamine%20Abuse%20in%20California.pdf
- 37. Rawson, R.A, Washton, A, Domier, C.P, and Reiber, C. Drugs and sexual effects: Role of drug type and gender. *Journal of Substance Abuse Treatment*, 2002; 22(2): 103-108.
- 38. Islam A and Faruque H. Md. Drug abuse and its impact on Bangladesh. *International Journal of Sociology and Anthropology*, 2017; 9(11): 143-156. doi: 10.5897/IJSA2016.0736
- 39. Rawson, R.A, Marinelli-Casey, P, Anglin, M.D, Dickow, A, Frazier, Y, Gallagher, C, Galloway, G.P, Herrell, J, Huber, A, McCann, M.J, Obert, J, Pennell, S, Reiber, C, Vandersloot, D, and Zweben, J. A multi-site comparison of psychosocial approaches for the treatment of methamphetamine dependence. *Addiction*, 2003; 99: 708–717. doi: 10.1111/j.1360-0443.2004.00707.x.
- Huber, A, Ling, W, Shoptaw, S, Gulati, V, Brethen, P, and Rawson, R. Integrating treatments for methamphetamine abuse: A psychosocial perspective. *J Addict Dis*, 1997; 16(4): 41–50. doi: 10.1080/10550889709511142
- 41. 41, 46. Firoz, R, A. Drug abuse in Bangladesh. The independentbd.com, 2017; 23.
- 42. 42. Hashim S M. The curse of yaba persists, 2017;
- 43. 43. Sinchai T, Plasen S, Sanvarinda Y, Jaisin Y, Govitrapong P, Morales NP, Ratanachamnong P, Plasen D. Caffeine potentiates methamphetamine-induced toxicity both in vitro and in vivo. Neurosci Lett, 2011; 502(1): 65-69. doi: 10.1016/i.neulet.2011.07.026. Epub 2011 Jul 23
- 44. 44. Volkow ND, Fowler JS, Wang GJ, Shumay E, Telang F, Thanos PK, Alexoff D. Distribution and Pharmacokinetics of Methamphetamine in the Human Body: Clinical Implications. PLoS One, 2010; 5(12): 15269. doi: 10.1371/journal.pone.0015269.

45. Roche, A. M,Trifonoff, A, & Ryan,K. Methamphetamine use among Aboriginal and Torres Strait Islander people: Intervention options for workers, National Centre for Education and Training on Addiction (NCETA), Flinders University, Adelaide, South Australia, 2019.