



Subsidization of Substance Use Treatment: Comparison of Methadone Maintenance Treatment and Abstinence-Based Residential Treatment in Iran

Samaneh Ahmadian Moghaddam ¹, Mohsen Roshanpajouh ², Ali Mazyaki ³, Mehri Amiri ⁴ and Emran Razaghi ^{5,*}

¹Department of Neuroscience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran

²Addiction Researches Department, School of Behavioral Sciences and Mental Health (Tehran Psychiatry Institute), Iran University of Medical Sciences, Tehran, Iran

³Department of Economics, Allameh Tabataba'i University, Tehran, Iran

⁴State Welfare Organization, Tehran, Iran

⁵Department of Psychiatry, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

*Corresponding author: Department of Psychiatry, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. Tel: +98-9121255458, Fax: +98-2155419113, Email: razaghi@sina.tums.ac.ir

Received 2019 October 07; Revised 2020 January 20; Accepted 2020 February 08.

Abstract

Background: Subsidization is a policy to encourage the purchase and use of goods and services and to promote their affordability for the poor. The Welfare Organization of Iran subsidizes substance use treatment in order to increase coverage and adherence to treatment.

Objectives: This study aimed to answer the following questions: is the model efficient? Has the policy resulted in increased coverage and higher adherence to substance use treatment? How could the model be improved?

Methods: We compared two types of substance use treatments of abstinence-based residential program and outpatient methadone maintenance. Based on their severity of addiction and retention in treatment clients who benefited from subsidization were compared with other clients. Therefore, 109 clients, 78 from methadone maintenance and 31 from residential abstinence-based programs were interviewed.

Results: Subsidization had an encouraging effect on clients to enter substance use treatment in both treatment programs ($P = 0.001$). However, we were unable to find evidence that subsidization helped retention in the treatment ($P = 0.389$), or that concomitant use of illegal substances in clients on methadone maintenance was lower ($P = 0.500$). Based on economic status of clients ($P = 0.05$) their criminal record ($P = 0.001$), length of use of substances ($P = 0.05$), and comorbid psychiatric conditions ($P = 0.05$), it was evident that assignment to subsidization in methadone maintenance services was significantly more reasonable, while it was almost random in abstinence-based residential facilities assignment.

Conclusions: The current model of substance use treatment subsidization is not efficient. Addiction severity subscales and socioeconomic status of clients could be considered appropriate factors for assignment to the subsidization program.

Keywords: Treatment Subsidization, Substance Use Treatment, Methadone Maintenance Treatment, Abstinence-Based Treatment, Iran

1. Background

According to the United Nations Office on Drugs and Crime (UNODC) (1) in 2017, 35 million people suffered from substance use disorders and required treatment services worldwide. The 2017 Global Burden of Disease Study estimated that globally there were 585,000 deaths and 42 million years of "healthy" life lost as a result of the use of substances. Based on estimates in the United States the total cost imposed by 20 million substance users on society in 2011 was as high as \$193 billion (2). The cost of substance

use worldwide, accordingly, would be more than \$330 billion. Based on a 2001 study, the cost of substance use for 2.5 million regular and 2.7 million casual substance users in Iran, was at least \$11.7 billion, with adjusted cost per capita of \$3900 per annum, equal to 200% of government tax revenue, 230% of non-oil exports, and 47% of oil exports (3). Substance use treatment and reduction of demand for substances is a rational strategy to reduce the high costs of substance use (4). In a systematic review conducted on cost-benefit analysis of various substance use treatment

strategies involving detoxification and maintenance therapy, a high economic return by substance use treatment programs was evidenced (5).

Substance use treatment involves strategies such as maintenance therapy and detoxification (6). Methadone maintenance is considered a gold standard for the treatment (7). However, only one in seven people receive treatment (1). Considering that only 15% of substance users undergo treatment, implementing strategies to increase treatment coverage would be of more importance than prioritizing cost-benefit treatments (8). Aside from limited insight in the need for treatment, affordability is a major constraint to seeking substance use treatment (9). For those who seek treatment, however, treatment costs may necessitate sacrificing basic needs in favor of substance use treatment (10). Abstaining from treatment not only may lead to the relapse of substance use and return of mentioned costs, but also may result in other negative consequences such as judicial and punitive system costs (11). In order to reduce the costs of substance use governments have taken the policy of subsidizing treatment (12-17). Subsidization of methadone maintenance treatment (MMT) has shown to double treatment retention rate and reduce the delay between dependence to substances and entry to treatment (18). However, arguments against the effectiveness of substance use treatment subsidization remain an economic and public health concern (19, 20).

In 2017, 7000 MMT clinics and 1200 abstinence-based residential facilities in Iran provided services to 900,000 and 400,000 clients, respectively (21). For the same year, the average cost of treatment for maintenance and residential services was Iranian Rials (IRR) (based on 2017 rate: IRR40,000 = US \$1) 1,280,000 and IRR 6,380,000 per month, respectively (22), with the difference that methadone maintenance is an ongoing treatment for up to several years while abstinence-based residential treatment, theoretically, is a single shot intervention. In 2017, Iran State Welfare Organization subsidized both types of maintenance treatment and abstinence-based residential service by IRR 1,000,000 and IRR 3,000,000, respectively.

2. Objectives

The objective of the current study was to evaluate the efficiency of subsidization policy by comparing the two treatment programs.

3. Methods

3.1. Study Design

The study was an applied descriptive-correlational research conducted in Tehran, Iran, during fall 2017. A

convenience sampling was made from outpatient maintenance and abstinence-based residential services where both clients received subsidies and full payment clients received the same treatment.

3.2. Study Participants

A total sample of 109 participants with 78 cases from outpatient maintenance treatment and 31 cases from residential facilities were recruited. Participation in this study was voluntary and inclusion criterion was limited to willingness to provide written consent by participants, where confidentiality of respondents' information was guaranteed by the researchers.

3.3. Tools

In order to measure the severity of substance use, a validated Persian-translation version (23) of addiction severity index (ASI) (24) was used. The Persian version of ASI had 114 questions covering six subscales of medical status, legal status, employment/support status, family/social relationship, psychiatric status, and substance use. We used urine test results for substances in clients' records as an indicator for measurement of treatment effectiveness.

3.4. Statistical Analysis

Considering our non-parametric data, we applied Kruskal-Wallis and Mann-Whitney-U statistical tests in addition to chi-square test to examine statistical significance of our findings.

4. Results

Demographic characteristics of studied subjects in methadone maintenance clinics and residential facilities are shown in Table 1. We used Mann-Whitney U test to compare demographic characteristics of clients from the two types of services (Table 2). All characteristics were significantly different between clients according to subsidization difference in maintenance treatment services. In MMT services older clients with less education and with less income were benefiting subsidized treatment. Such a pattern, however, was not present in clients from residential facilities.

In order to measure the effect of subsidization on retention in treatment, we compared the retention in the maintenance treatment between clients who received subsidies and control group. We also compared urine test records between the two groups. As seen in Table 3, there was no difference between the two groups. This effect was not measured in the participants from residential services

Table 1. Demographic Characteristics of Participants^a

Variable	Center Type	
	MMT	RF
Age, y	44.0 ± 10.9	34.1 ± 8.9
Education (% high school graduate and above)	29.5	54.8
Monthly income in 3 months prior to admission for treatment (IRR)	12,500,000 ± 8800000	8,120,000 ± 5700000

Abbreviations: MMT, methadone maintenance treatment; RF, abstinence-based residential facilities.

^aValues are expressed as mean ± SD.

Table 2. Comparative Demographic Characteristics of Participants (Mann-Whitney U test)

Variable	Treatment Type	Subsidization	Mean Rank	Z-Score	Significance Level
Age, y	MMT	Subsidized	44.91	-2.056	0.040
		Not subsidized	34.36		
	RF	Subsidized	16.28		
		Not subsidized	15.70		
Education (high school graduate and above)	MMT	Subsidized	34.28	-2.222	0.026
		Not subsidized	44.46		
	RF	Subsidized	16.50		
		Not subsidized	15.47		
Monthly income in 3 months prior to admission for treatment (IRR)	MMT	Subsidized	30.43	-3.467	0.001
		Not subsidized	48.11		
	RF	Subsidized	18.22		
		Not subsidized	13.63		

Abbreviations: MMT, methadone maintenance treatment; RF, abstinence-based residential facilities.

Table 3. Association Between Receiving Subsidies and Retention in Treatment and Negative Urine Tests in MMT Group (Pearson-Chi-Square)

Variable	Value	Significance Level
Retention in treatment	75.999	0.389
Negative urine test for illegal substances	1.014	0.500

Abbreviation: MMT, methadone maintenance treatment.

Table 4. Association Between Benefiting Subsidies and Engagement in Treatment (Kendall Test)

Treatment Type	Value	Significance Level
Methadone maintenance	0.538	0.000
Abstinence-based residential service	0.776	0.000

because they were not followed after completion of a one-month treatment program.

We asked the participants whether they were aware that they could apply for treatment subsidy and whether it worked as an incentive for admission for treatment. A Kendall statistical test showed that for both clients in maintenance treatment and in residential service subsidization had a significant effect in engagement in the treatment (Table 4).

We further tested subsidization of treatment according to addiction severity subscales. As shown in Table 5, medical status, substance use, and family/social relationship subscales had played no role in subsidization alloca-

tion. However, for clients in methadone maintenance services legal status, employment/support status, and psychiatric status were subscales that showed significant differences according to subsidization status of clients. No such difference was observed in clients from abstinence-based residential services.

5. Discussion

According to the World Health Organization (25) in 2009, among 147 countries worldwide, less than 50% had a specific budget for treating substance use disorders. Tax-based funding, out-of-pocket payments and social health insurance were among the foremost methods of funding

Table 5. Subsidization of Treatment According to Addiction Severity Subscales (Mann-Whitney U Test)

Variable	Treatment Type	Subsidization	Mean Rank	Z-Score	Significance Level
Medical status	MMT	Subsidized	40.74	-0.703	0.482
		Not subsidized	38.33		
	RF	Subsidized	17.31	-0.917	0.359
		Not subsidized	14.60		
Legal status	MMT	Subsidized	47.57	-3.560	0.000
		Not subsidized	31.84		
	RF	Subsidized	14.91	-0.836	0.495
		Not subsidized	17.71		
Employment/support status	MMT	Subsidized	47.28	-3.113	0.002
		Not subsidized	32.11		
	RF	Subsidized	16.03	-0.020	0.984
		Not subsidized	15.97		
Substance use subscale	MMT	Subsidized	44.14	-1.859	0.063
		Not subsidized	35.9		
	RF	Subsidized	15.28	-0.490	0.624
		Not subsidized	16.77		
Family/social relationship	MMT	Subsidized	40.76	-0.626	0.531
		Not subsidized	38.30		
	RF	Subsidized	17.94	-1.285	0.199
		Not subsidized	13.93		
Psychiatric status	MMT	Subsidized	45.18	-2.258	0.024
		Not subsidized	34.10		
	RF	Subsidized	16.91	-0.599	0.549
		Not subsidized	15.03		

Abbreviations: MMT, methadone maintenance treatment; RF, abstinence-based residential facilities.

treatment for alcohol and substance use disorders. Africa was the only region in which out-of-pocket payments were reported to be the main funding method for alcohol and substance use disorder treatment services. The opposite end of the spectrum is compulsory drug detention and rehabilitation centers which are generally operated by governments and are commonly seen in East and South Asia (26). In the United States, substance use disorder treatment is financed primarily by federal block grants and state and local general revenues (27). Subsidization of dispensing fee in community pharmacy-based MMT programs in Australia (18) and subsidization of substance use treatment as a part of anti-viral therapy program in HIV-infected drug users in Indonesia (17), India (28), and United States (29) are among various subsidization policies in the field of substance use treatment.

In Iran, the monthly fee for methadone substitution

therapy in 2017 with an average daily dose of 80 mg was around IRR1,280,000, which was equivalent to 14% of a full-time minimum wage. At the same time-period, abstinence-based residential programs had a fee around IRR 6,380,000 - 68% of a full-time minimum wage - for a four-week detoxification service. It is worth mentioning, however, that both programs charged their clients below the advertised fees for a marketing purpose. In 2017, the State Welfare Organization subsidized both types of maintenance treatment and abstinence-based residential service by IRR 1,000,000 and IRR 3,000,000, respectively. Moreover, the average nominal cost of Iranian households in 2017 was IRR 26,600,000 compared to nominal income of IRR 30,500,000 (30), indicating an extremely narrow margin for treatment costs. This situation with no well-defined insurance coverage in place for substance use treatment, leads treatment clients and their families to so called catas-

trophic payment (31).

A study in Vietnam (32), recommended government subsidies for people of lower socioeconomic status entering substance use treatment. According to our study, only a limited number of methadone maintenance and abstinence-based residential facilities were enrolled in subsidization program with enrollment giving a market privileged position to those services in terms of attracting clients. We were unable to identify a standard method for selection of specific service to be enrolled in subsidization program. Also, inclusion of clients in the program did not follow a defined criterion and was exclusively based on program directors' personal opinion. However, our analysis (Table 4) showed that enrollment in subsidization program had played an encouraging role in seeking substance use treatment. Nevertheless, considering age, level of education, and income prior to admission to treatment as indicators for enrolling a client in subsidization program, our findings (Table 2) show that, compared to residential facilities, the management of methadone maintenance services has made a meaningful differentiation between clients selected for enrollment in subsidization program and clients excluded from the program. Therefore, one may conclude that enrollment in subsidization program in maintenance treatment facilities followed a logical criterion based on age, level of education, and average income during three months prior to admission to the treatment.

Considering the remarkable role of economic indexes in treatment entry and retention (18), although residential services did not measure any indicator of progress and outcome of their intervention, we decided that follow-up urine test for substances, available in methadone maintenance services, as an indicator for treatment effectiveness. Our comparison between methadone maintenance clients according to their enrollment in subsidization program status did not show a difference in their follow-up urine tests (Table 3). In other words, we conclude that, at least in methadone maintenance services, subsidization of treatment did not result in a better outcome.

In the present study, among the subscales measured by ASI, family/social relationship of cost payers showed no difference between clients benefiting subsidization and normal clients in neither of the two services of methadone maintenance and abstinence-based residential treatment (Table 5). Employment/support, legal, and psychiatric status, however, were subscales that had played a role for enrollment in subsidization program in methadone maintenance services but not in residential services. One could, therefore, conclude that the management of methadone maintenance services had been sensitive to those subscales as indicators for enlisting clients for treatment subsidization. It has been shown that subsidization of treat-

ment for people with a lower willingness to pay would be an optimal strategy (33). The results of current study indicated that psychiatric, medical, and substance use status of clients were associated with willingness to pay for treatment.

Considering that compared to methadone maintenance treatment, abstinence-based residential treatment programs are extremely ineffective, with relapse rates of 30% versus 85%, respectively (34, 35), it seems that, economic-wise, subsidization of the former program would be of much higher rationale. Moreover, our study revealed that the process of selection of clients for subsidization in methadone maintenance services was to some extent according to identified indicators, where in abstinence-based residential services it followed no identified order. Furthermore, while treatment cost in abstinence-based residential programs is theoretically a one-time payment and in methadone maintenance program it is a continuous monthly payment the fraction of treatment fee that was subsidized, almost 80% of a single monthly fee, did not elicit any rational basis. In fact, almost the whole of an ineffective treatment (abstinence-based residential treatment) was subsidized, while only one monthly bill of a several years treatment program (methadone maintenance treatment) was covered.

According to the current study, the total reliance of the subsidization policy on the management of the two types of services for selection and enrollment of clients for subsidization program showed a great failure, at least for the part of abstinence-based residential services where enrollment followed no order and was mere random. We, however, would recommend that the subsidization policy should be converted into a more delicate health insurance policy.

5.1. Limitations

This was the first study to evaluate the effectiveness of substance use subsidization in Iran and could be a basis for further economic studies. As subjects in this study were from services that were already covered by subsidization program of the welfare organization, potential selection biases could have happened in our study. However, we tried to avoid this bias by including clients not enjoying subsidization program from same services as control group. Generalization of the results of this study to the average client seeking substance use treatment and to other methadone maintenance treatment and abstinence-based residential programs should be with caution. The more limited number of samples from abstinence-based residential services should add to cautious generalization of findings of this study. Another limitation of this study

is that as a cross-sectional study it sought association between addiction severity and effectiveness of subsidization. Maybe, studies with acceptable follow-up period are needed to provide a more comprehensive understanding of the effectiveness of subsidization of substance use treatment.

5.2. Conclusions

Our study reviewed and compared the process of subsidization of substance use treatment in two different programs of abstinence-based residential treatment and methadone maintenance treatment. We found that enrollment for subsidized treatment in abstinence-based residential services did not follow an evidence-based rationale. While we were unable to measure subsidization effect on treatment outcome in abstinence-based residential treatment, it had no effect on methadone maintenance treatment.

Acknowledgments

The authors would like to thank the Iranian Welfare Organization for facilitating this study.

Footnotes

Authors' Contribution: Samaneh Ahmadian Moghaddam, Emran Razaghi, Mohsen Roshanpajouh, and Ali Mazyaki designed the research. Samaneh Ahmadian Moghaddam performed the research and analyzed the data. Samaneh Ahmadian Moghaddam, Emran Razaghi, and Ali Mazyaki wrote the article.

Clinical Trial Registration Code: None declared.

Conflict of Interests: The authors declare that they have no competing interests.

Ethical Approval: The proposal of this study was approved by the IRB of Tehran University of Medical Sciences with the reference code of 9121457002.

Funding/Support: This study was in part funded by Tehran University of Medical Sciences.

Informed Consent: Written informed consent was obtained from all participants.

References

- UNODC. *World drug report 2019*. United Nations; 2019.
- NDIC. *National drug threat assessment, 2011*. US: Department of Justice National Drug Intelligence; 2011.
- Mokhtarian HHA. Drugs economy: Estimation of costs in Iran. *Rev Iran Soc Probl*. 2009;1(4):151-75.
- Patel V, Chisholm D, Parikh R, Charlson FJ, Degenhardt L, Dua T, et al. Addressing the burden of mental, neurological, and substance use disorders: Key messages from disease control priorities, 3rd edition. *The Lancet*. 2016;387(10028):1672-85. doi: 10.1016/s0140-6736(15)00390-6.
- Cartwright WS. Cost-benefit analysis of drug treatment services: review of the literature*. *J Ment Health Policy Econ*. 2000;3(1):11-26. doi: 10.1002/1099-176x(200003)3:1<11::aid-mhp66>3.0.co;2-0. [PubMed: 11967433].
- Veilleux JC, Colvin PJ, Anderson J, York C, Heinz AJ. A review of opioid dependence treatment: pharmacological and psychosocial interventions to treat opioid addiction. *Clin Psychol Rev*. 2010;30(2):155-66. doi: 10.1016/j.cpr.2009.10.006. [PubMed: 19926374].
- O'Connor PG. Methods of detoxification and their role in treating patients with opioid dependence. *JAMA*. 2005;294(8):961-3. doi: 10.1001/jama.294.8.961. [PubMed: 16118388].
- Murphy SM, Polsky D. Economic evaluations of opioid use disorder interventions. *Pharmacoeconomics*. 2016;34(9):863-87. doi: 10.1007/s40273-016-0400-5. [PubMed: 27002518]. [PubMed Central: PMC5572804].
- McCullister KE, French MT, Pyne JM, Booth B, Rapp R, Carr C. The cost of treating addiction from the client's perspective: Results from a multi-modality application of the Client DATCAP. *Drug Alcohol Depend*. 2009;104(3):241-8. doi: 10.1016/j.drugalcdep.2009.05.014. [PubMed: 19574000]. [PubMed Central: PMC2737263].
- Vanagas G, Padaiga Z, Bagdonas E. Cost-utility analysis of methadone maintenance treatment: A methodological approach. *Subst Use Misuse*. 2006;41(1):87-101. doi: 10.1080/10826080500368751. [PubMed: 16393738].
- Zaller ND, Fu JJ, Bazazi AR, Rich JD. The impact of financial discharge from methadone maintenance therapy on incarceration. *J Opioid Manag*. 2010;6(5):365-70. doi: 10.5055/jom.2010.0034. [PubMed: 21046934]. [PubMed Central: PMC3028516].
- Anglin MD, Speckart GR, Booth MW, Ryan TM. Consequences and costs of shutting off methadone. *Addict Behav*. 1989;14(3):307-26. doi: 10.1016/0306-4603(89)90062-2. [PubMed: 2787586].
- Hser YI, Joshi V, Maglione M, Chou CP, Anglin MD. Effects of program and patient characteristics on retention of drug treatment patients. *Eval Program Plan*. 2001;24(4):331-41. doi: 10.1016/s0149-7189(01)00027-1.
- Yin W, Hao Y, Sun X, Gong X, Li F, Li J, et al. Scaling up the national methadone maintenance treatment program in China: Achievements and challenges. *Int J Epidemiol*. 2010;39 Suppl 2:ii29-37. doi: 10.1093/ije/dyq210. [PubMed: 21113034]. [PubMed Central: PMC2992615].
- Chaar BB, Hanrahan JR, Day C. Provision of opioid substitution therapy services in Australian pharmacies. *Australas Med J*. 2011;4(4):210-6. doi: 10.4066/AMJ.2011.706. [PubMed: 23393513]. [PubMed Central: PMC3562900].
- Shepherd A, Perrella B, Hattings HL. The impact of dispensing fees on compliance with opioid substitution therapy: A mixed methods study. *Subst Abuse Treat Prev Policy*. 2014;9:32. doi: 10.1186/1747-597X-9-32. [PubMed: 25108396]. [PubMed Central: PMC4136401].
- Siregar AY, Tromp N, Komarudin D, Wisaksana R, van Crevel R, van der Ven A, et al. Costs of HIV/AIDS treatment in Indonesia by time of treatment and stage of disease. *BMC Health Serv Res*. 2015;15:440. doi: 10.1186/s12913-015-1098-3. [PubMed: 26424195]. [PubMed Central: PMC4590258].
- Chalmers J, Ritter A. Subsidising patient dispensing fees: The cost of injecting equity into the opioid pharmacotherapy maintenance system. *Drug Alcohol Rev*. 2012;31(7):911-7. doi: 10.1111/j.1465-3362.2012.00472.x. [PubMed: 22624529].
- Humphreys K, Wagner TH, Gage M. If substance use disorder treatment more than offsets its costs, why don't more medical centers want to provide it? A budget impact analysis in the Veterans Health Administration. *J Subst Abuse Treat*. 2011;41(3):243-51. doi: 10.1016/j.jsat.2011.04.006. [PubMed: 21664790].

20. Meara E, Frank RG. Spending on substance abuse treatment: How much is enough? *Addiction*. 2005;**100**(9):1240-8. doi: [10.1111/j.1360-0443.2005.01227.x](https://doi.org/10.1111/j.1360-0443.2005.01227.x). [PubMed: [16128713](https://pubmed.ncbi.nlm.nih.gov/16128713/)]. [PubMed Central: [PMC1402649](https://pubmed.ncbi.nlm.nih.gov/PMC1402649/)].
21. *Rehab Centers to open in 14 provinces*. Tehran: IRNA; 2018.
22. *Ratification on rates for substance use treatment, 2017*. Tehran: Iran Official Press; 2018.
23. Ekhtiari H, Edalati H, Behzadi A, Safaei H, Noori M, Mokri A. Designing and evaluation of reliability and validity of five visual cue-induced craving tasks for different groups of opiate abusers. *Iran J Psychiatry Clin Psychol*. 2008;**14**(3):337-49.
24. McLellan AT, Kushner H, Metzger D, Peters R, Smith I, Grissom G, et al. The fifth edition of the addiction severity index. *J Subst Abuse Treat*. 1992;**9**(3):199-213. doi: [10.1016/0740-5472\(92\)90062-s](https://doi.org/10.1016/0740-5472(92)90062-s). [PubMed: [1334156](https://pubmed.ncbi.nlm.nih.gov/1334156/)].
25. World Health Organization. *ATLAS on Substance Use (ATLAS-SU): Resources for the prevention and treatment of substance use disorders*. 2010. Available from: https://www.who.int/substance_abuse/activities/atlas/en.
26. Fu JJ, Bazazi AR, Altice FL, Mohamed MN, Kamarulzaman A. Absence of antiretroviral therapy and other risk factors for morbidity and mortality in Malaysian compulsory drug detention and rehabilitation centers. *PLoS One*. 2012;**7**(9). e44249. doi: [10.1371/journal.pone.0044249](https://doi.org/10.1371/journal.pone.0044249). [PubMed: [23028508](https://pubmed.ncbi.nlm.nih.gov/23028508/)]. [PubMed Central: [PMC3445567](https://pubmed.ncbi.nlm.nih.gov/PMC3445567/)].
27. Mark TL, Yee T, Levit KR, Camacho-Cook J, Cutler E, Carroll CD. Insurance financing increased for mental health conditions but not for substance use disorders, 1986-2014. *Health Aff (Millwood)*. 2016;**35**(6):958-65. doi: [10.1377/hlthaff.2016.0002](https://doi.org/10.1377/hlthaff.2016.0002). [PubMed: [27269010](https://pubmed.ncbi.nlm.nih.gov/27269010/)].
28. Rowe J. *A raw deal? Impact on the health of consumers relative to the cost of pharmacotherapy*. Melbourne | Australia: RMIT University, Centre for Applied Social Research; 2007.
29. Siregar AYM. *Economic analysis of HIV and AIDS control in Indonesia*. Indonesia; 2014.
30. Solomon SS, Srikrishnan AK, Vasudevan CK, Anand S, Kumar MS, Balakrishnan P, et al. Voucher incentives improve linkage to and retention in care among HIV-infected drug users in Chennai, India. *Clin Infect Dis*. 2014;**59**(4):589-95. doi: [10.1093/cid/ciu324](https://doi.org/10.1093/cid/ciu324). [PubMed: [24803381](https://pubmed.ncbi.nlm.nih.gov/24803381/)]. [PubMed Central: [PMC4334837](https://pubmed.ncbi.nlm.nih.gov/PMC4334837/)].
31. Sorensen JL, Haug NA, Delucchi KL, Gruber V, Kletter E, Batki SL, et al. Voucher reinforcement improves medication adherence in HIV-positive methadone patients: A randomized trial. *Drug Alcohol Depend*. 2007;**88**(1):54-63. doi: [10.1016/j.drugalcdep.2006.09.019](https://doi.org/10.1016/j.drugalcdep.2006.09.019). [PubMed: [17056206](https://pubmed.ncbi.nlm.nih.gov/17056206/)]. [PubMed Central: [PMC1976289](https://pubmed.ncbi.nlm.nih.gov/PMC1976289/)].
32. ISC. *Income and costs for urban households*. Tehran: Iran Statistics Center; 2018.
33. Amin-Esmaeili M, Hefazi M, Radgoodarzi R, Motevalian A, Sharifi V, Hajebi A, et al. Out-of-pocket cost of drug abuse consequences: Results from Iranian National Mental Health survey. *East Mediterr Health J*. 2017;**23**(3):150-60. doi: [10.26719/2017.23.3.150](https://doi.org/10.26719/2017.23.3.150). [PubMed: [28493261](https://pubmed.ncbi.nlm.nih.gov/28493261/)].
34. Tran BX. Willingness to pay for methadone maintenance treatment in Vietnamese epicentres of injection-drug-driven HIV infection. *Bull World Health Organ*. 2013;**91**(7):475-82. doi: [10.2471/BLT.12.115147](https://doi.org/10.2471/BLT.12.115147). [PubMed: [23825874](https://pubmed.ncbi.nlm.nih.gov/23825874/)]. [PubMed Central: [PMC3699795](https://pubmed.ncbi.nlm.nih.gov/PMC3699795/)].
35. Bishai D, Sindelar J, Ricketts EP, Huettner S, Cornelius L, Lloyd JJ, et al. Willingness to pay for drug rehabilitation: implications for cost recovery. *J Health Econ*. 2008;**27**(4):959-72. doi: [10.1016/j.jhealeco.2007.11.007](https://doi.org/10.1016/j.jhealeco.2007.11.007). [PubMed: [18207264](https://pubmed.ncbi.nlm.nih.gov/18207264/)]. [PubMed Central: [PMC2601723](https://pubmed.ncbi.nlm.nih.gov/PMC2601723/)].