

Disclosure status of HIV-positive children and associated factors among children in public health facilities in East Arsi zone, Oromia regional state, South Eastern Ethiopia: A cross-sectional study

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Abstract

Objectives: This study aims to assess the disclosure status of HIV-positive children and its associated factors in selected hospitals in East Arsi zone, Oromia regional state, Ethiopia, 2020.

Methods: Institutional-based cross-sectional study design was conducted on 410 sample size. Four hospitals were randomly selected among hospitals that currently gave service. Data were collected from caregivers/biological parents by interviewing from 30 July 2020 to 30 August 2020 using the systematic random sampling technique. In logistic regression analysis, the variables which had independent correlations with dependent variable were identified based on adjusted odds ratio and a p value <0.05 with 95% confidence interval was claimed as statistically significant.

Results: Disclosure status of HIV-positive children was 59.8%, 95% confidence interval (54.9, 64.1). Children diagnosed at the age of <5 (adjusted odds ratio=0.25, 95% confidence interval (0.126, 0.49)), antiretroviral therapy follow-up for 6–15 years (adjusted odds ratio=2.08, 95% confidence interval (1.013, 4.29)), children diagnosed at the appropriate age of ≥ 12 years (adjusted odds ratio=1.95, 95% confidence interval (1.09, 3.49)), and children diagnosed at the age of <11 years (adjusted odds ratio=4.5, 95% confidence interval (3.45, 8.38)) were positively associated factors to disclose status.

Conclusion: The disclosure status of HIV-positive children was low in this study. Antiretroviral therapy follow-up for 6–15 years, children diagnosed at the appropriate age of ≥ 12 years, children diagnosed at the age of <5 years, and children who aged below 11 years were positively associated with disclosure status. Thus, we recommended, health care providers and all stakeholders should give age-appropriate counseling regarding when and why to disclose their status.

Keywords

HIV, disclosure, children, parental, factors associated, Arsi, Oromia, Ethiopia

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Introduction

Human immunodeficiency virus (HIV) that cause acquired immune deficiency syndrome (AIDS) has become one of the world's most serious health and development challenges.¹ In 2017, with an estimate of 613,000 people living with HIV (PLHIV), 62% were female in Ethiopia. Almost three-fourths (74%) of PLHIV are residing in Amhara, Oromia, and Addis Ababa.²

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Since some parents and health care professionals are unwilling to inform children about their HIV infection status, the level of disclosure status of HIV/AIDS to a child is becoming an increasingly common issue in clinical practice.³

Prevalence of disclosure to HIV-positive children was 33.3% in Ghana,⁴ 37% in Uganda,⁵ and 56% in Jinja Hospital in Uganda.⁶ Furthermore, the prevalence of disclosure to HIV-positive children was 33% in Tanzania.⁷ Studies in Eastern Cape (South Africa) and Western Kenya revealed that 35.5% and 11.1% had disclosed HIV status to their children, respectively.^{8,9} Moreover, the prevalence of disclosure status of HIV in Tanzania, Center of Excellence (COE) in Mbeya was 32.6%.³ Likewise, the prevalence of disclosure status to their children was 33.3% and 39.5% in East Gojjam and Northwest Gondar, respectively.^{10,11} Likewise, a study conducted in antiretroviral therapy (ART) clinics in Gondar town revealed that the prevalence was 44%.¹²

According to the study conducted in Ghana, it revealed that the age of children, level of education, administration of own HIV medications, and long duration on HIV medication were the factors associated with disclosure status.⁴ Likewise, fear that children may tell other people about the parent's HIV status, being on ART, desire not to worry or upset children, and perceptions that children may not understand, age of the child, and age of the parent were positively associated with parental disclosure of their HIV-positive status study conducted in Uganda.^{5,6} The study conducted in Tanzania also revealed that being girls and children living with their biological families were positively associated with disclosure status.⁷ Whereas age of the child, length of stay on antiretroviral drug treatment, and responsibility to take drugs were significantly associated with disclosure in the study conducted in East Gojjam.¹⁰ Likewise, age of the child and death of family members were the associated factors of disclosure of HIV-positive status to infected children in Northwest Gondar.¹¹

A study conducted in Malawi showed that fear of robbing their child's happiness and fear of confidentiality issue are one among the barriers not to disclose their status.¹³

Disclosure decisions are complex because of stigma, social support concerns, family relations, and parenting skills. In addition, children's emotional status, maturation stage, and cope toward nature of the illness are making the decision of disclosure problematic. However, lack of disclosure ultimately harmfully affects the well-being of the child, including access to pediatric HIV treatment and care and adherence to treatment.^{3,14,15}

Even though different studies are conducted in several countries, it does not represent the result of other areas and also as far as our knowledge despite the significance of disclosure, relevant studies are not conducted in the study area until now. Therefore, the purpose of this study is to assess disclosure status of HIV-positive children and its associated factors in selected hospitals in East Arsi zone, Oromia regional state, Ethiopia, 2020. The findings of this study will

be useful in benefiting the children who are HIV positive, parents/caregivers of children, the community as a whole, the health profession, zonal health bureau, and hospitals.

Methods

Study area and period

Arsi zone is one of the zones which is found in Oromia regional states and is located in Ethiopia with area of 21,120.29 sq. km. The Arsi zone contains 25 woredas which are classified into 499 rural villages and 59 towns (Arsi zone profile of 2008). According to Arsi zone profile of 2016, there are 497 health posts, 97 governmental health centers, 8 governmental hospitals, and 256 private clinics in Arsi zone. The study was conducted from 30 July 2020 to 30 August 2020.

Study design and population

The institutional-based cross-sectional study design was conducted from 30 July 2020 to 30 August 2020. All parents/caregivers whose HIV-positive children aged 6–15 years who had to have a follow-up at pediatric ART and care centers in East Arsi zone public hospitals were the source of population. Whereas all parents/caregivers whose HIV-positive children aged 6–15 years who have a follow-up at pediatric ART and care centers among randomly selected hospitals (Arsi Robe, Abomsa, Bokoji, and Asella teaching and referral hospitals) in East Arsi zone were the study population.

Inclusion criteria. Parents/caregivers whose children aged 6–15 years who are currently receiving highly active antiretroviral therapy and diagnosed 6 months before the study, and previously counseled caregivers on the importance of drug adherence were included in the study. Children whose parents are absent at the time of data collection were excluded from the study.

Sample size determination and procedure

The sample size was calculated by using the single population proportion formula by considering the assumption "95% confidence level, margin of error (0.05)." The magnitude of HIV-positive status disclosure among children in East Gojjam was 33.3%.¹⁰

$$n = \frac{\left[\frac{Z_{\alpha}}{2} \right]^2}{d^2} * P(1 - P)$$

where n is the required sample size, Z is the percentage of the standard normal distribution corresponding to 95% confidence interval (CI) which is equal to 1.96, P is the prevalence of HIV status disclosure to children (33.3%), $d=0.05$ (5%) marginal error

$$n = \frac{1.96 * 1.96 * 0.333 * 0.667}{(0.05)^2} = 341.16 \approx 342$$

Furthermore, to calculate the sample size for second objective, we use Epi-info version 7.1. For instance, using factors associated with HIV status from a study conducted in Gojjam by taking variables of a long stay in ART and stay with non-biological family. Finally, we got 380 as the sample size. Then, taking the larger sample size of 380, by adding 10% non-response rate, the final sample size is 418. Systematic random sampling technique was employed to select the participants of the study. First, four public hospitals, namely, Arsi Robe, Abomsa, Bokoji, and Asella teaching and referral hospitals, were selected by simple random sampling followed by the selection of eight public hospitals which give service of ART. Second, Proportional allocation was made according to the number of patients follow-up in each selected hospital. Then, all parents/caregivers of children aged 6–15 years who have follow-up among selected hospitals of ART were selected by systematic sampling techniques.

Measurements and definitions

Study variables. Disclosure of HIV status was a dependent variable. Whereas sociodemographics of caretaker-related factors (age, sex, residence, marital status, religion, occupation, educational status, and relation to the child), children-related factors (age, sex, educational level, with whom a child lives, family presence, and lost a family member by HIV), and clinically related factors (HIV status of caregiver, caregiver ART status, child age at diagnosis of HIV, World Health Organization (WHO) clinical stage, and child duration on ART) were independent variables.

Operational definition

Disclosure. When children are told the name of the illness (HIV and/or AIDS disease-specific information) and how they acquired the disease.¹²

Biological parents/caregivers. A person who lives with the child and who knows most about the child's health participates in the child's daily care. They may be biological parents or caregivers.¹⁰

Data collection tool and process. The questionnaire was adopted from different kinds of literature (Supplemental Material).^{10–12,16,17} The questionnaire was carefully converted into Amharic and Afan Oromo and then converted back to English to check its contents. English version was used for data collection. Before actual data collection time, the questionnaire was checked for clarity, comprehensiveness, and content validity by an expert as well as pretested for reliability on 5% of the total sample at Qarsa hospital, after which possible adjustment or modification was made

on the tool. The collected data were then reviewed and checked for completeness and consistency by supervisors daily.

Data quality assurance. To maintain the quality of the data, data collectors and supervisors were trained on objective, consent, confidentiality, purposes and expected outcomes of the study, and data collection procedures for one day. Six BSc nurses were selected to collect data. Before actual data collection time, the questionnaire (tool) was checked for clarity, comprehensiveness, and content validity by an expert as well as pretested for reliability on 5% of the total sample at Qarsa hospital 2 weeks before the data collection period, after which possible adjustment or modification was made on the tool. The collected data were then reviewed and checked for completeness and consistency by supervisors and investigators daily.

Statistical analysis. Data entry was performed by using Epi data version 3.1 (EpiData Association, Odense, Denmark). Then, the entered data were checked and exported to Statistical Package for Social Sciences (SPSS) version 21 (IBM Corp., Armonk, NY, USA) for analysis. Descriptive statistics like frequency, percentage, and measures of central tendency with the corresponding measure of dispersion were used for the presentation of sociodemographic and other variables. Table, graphs, and texts were used to present the findings. Binary logistic regression analysis was applied to identify factors associated with the dependent variable. Then, variables with a p value <0.25 in the bivariate analysis were entered into the multivariate model to control the effects of confounder(s) and to identify independent variables. Finally, the variables which had independent correlations with parental disclosure status to their child were identified based on adjusted odds ratio (AOR) and a p value <0.05 with 95% CI were claimed as statistically significant.

Result

Sociodemographic characteristics of study participants

About 410 study participants have participated in the study making a response rate of 98.08%. Concerning the residence of study participants, about 227 (55.4%) are living in urban area. Regarding the occupation of study participants, about 130 (31.7%) are farmers (Table 1).

Disclosure status of HIV-positive children in Arsi zone. The proportion of disclosure status of HIV-positive children was 59.8% (95% CI (54.9, 64.1)).

About 47.8% of responsible persons to disclose their status were parents. Regarding the reasons to disclose HIV status to children, 88 (35.62%) of them disclosed to their child due to the reason that the child is mature enough and 38

Table 1. Sociodemographic characteristics of study participants in selected public hospitals of Arsi zone 2020 (n=410).

Variables	Category	Frequency	Percentage
Age of parents/ caregivers	<30	46	11.2
	30–40	78	43.4
	>40	186	45.4
Sex of parents/ caregivers	Male	130	31.7
	Female	280	68.3
Religion	Muslim	211	51.5
	Orthodox	122	29.8
	Protestant	61	14.9
	Others ^a	16	3.9
Marital status	Single	32	7.8
	Married	238	58
	Divorced	67	16.3
	Widowed	73	17.8
Ethnicity	Oromo	194	47.3
	Amhara	164	40
	Tigre	45	11
	Others ^a	7	1.7
Residence	Urban	227	55.4
	Rural	183	44.6
HIV status of parents	Positive	248	60.5
	Negative	91	22.2
	Unknown	71	17.3
Income	<1000	115	28.05
	1001–3000	247	60.24
	≥3001	48	11.71
Occupation of parents	Farmer	130	31.7
	Merchants	100	24.4
	Housewife	81	19.8
	Employee	99	24.1
Family size	≤3	227	55.4
	≥4	183	44.6
Sex of the child	Male	220	53.7
	Female	190	46.3
Age of the child	<10 years	132	32.2
	≥10 years	278	67.8
Child is currently living with	Parents	291	71
	Grandparents	86	21
	Relatives	33	8
Is child lose any of his/her families	Yes	136	33.2
	No	274	66.8
Educational status of a child	Not started	71	17.3
	Kindergarten	74	18.0
	Primary school	191	46.6
	Secondary school	74	18.0
Educational status of parents/ caregivers	Unable to read and write	81	19.8
	Able to read and write	82	20
	Primary	110	26.8
	Secondary	79	19.3
	Higher education	58	14.1

^awaqeffata, catholic regarding the religion whereas a in ethnicity Gurage, sidama, hadiya.

(15.38%) of them disclosed because of the fear of the child might hard from other body. Furthermore, 24.6% of children were given harmful name due to disclosure of their status (Table 2).

Factors associated with disclosure status of HIV-positive children. Binary logistic regression analysis was applied to identify factors associated with the disclosure status of HIV-positive children. Then, variables with a *p* value <0.25 in the bivariate analysis were entered into the multivariate model to control the effects of confounder(s) and to identify independent variables.

The odds of HIV disclosure positive status among children who had ART follow-up aged 6–15 years were 2.08 times (AOR=2.08, 95% CI (1.013, 4.29) higher than those who have ART follow-up <5 years.

The likelihoods of HIV disclosure among children who were diagnosed at the appropriate age of ≥12 years were almost two times (AOR=1.95, 95% CI (1.09, 3.49)) more likely as compared to those diagnosed at the age of 6–12 years.

Likewise, the odds of disclosing HIV-positive status among children diagnosed at the age of <5 years had almost 75% (AOR=0.25, 95% CI (0.126, 0.49) more folds as compared with children who were diagnosed at the age of ≥5 years.

Furthermore, the likelihoods of disclosure of their HIV status among children aged below 11 years had 4.5 times (AOR=4.5, 95% CI (3.45, 8.38)) more as compared with their counterparts (Table 3).

Discussion

In this study, the disclosure status of HIV-positive children was 59.8% (95% CI (54.9, 64.1)). It is consistent with a study done in Uganda which showed 56% in Jinja Hospital⁶ and the study conducted in Dire Dawa showed 60.6%.¹⁸ The possible explanation could be due to the same segment study population in which the study was conducted. However, the finding of this study was higher than the study conducted around Bale zone (28.5%),¹⁷ Tanzania (32.6%),³ Central Region of Ghana (23.3%),¹⁹ and in Odi district (40%).²⁰ The difference might be due to the fact that currently there is different training about disclosure which starts disclosure process at 6-year age in Ethiopia. The formation of psychosocial support team and awareness of healthcare providers toward disclosure had greater input for disclosing children early, which makes difference between those studies.¹⁶ In addition, the variation could be the difference of study population. For instance, in the study conducted in Tanzania and South Africa, the study participants were aged between 4 and 17 years, whereas this study was conducted on 6–15 years which was different. Furthermore, the previous study conducted in Central Region of Ghana and also in Odi district was different in population segment which makes a variation of disclosure status.

Table 2. Items of questions related to disclosure status of children in selected public hospitals of Arsi zone ($n=410$).

Variables	Category	Frequency	Percentage
The best responsible person to disclosure	Parents	196	47.8
	Health-care providers	126	30.7
	Grandparents	88	21.5
Reason to disclose HIV status to children ($n=247$)	A child is mature enough	88	35.62
	Repeated question of a child, why he/she take a drug	80	32.38
	Fear of might hear from another person	38	15.38
	The child refused to take a drug	41	16.59
Appropriate age to disclose	6–12	216	52.68
	≥ 12	194	47.32
Children face the following due to disclosure	Avoided from playing with them	98	23.9
	Given harmful name	101	24.6
	Child lost interest	138	33.7
	The child felt shame due to HIV	73	17.8

Table 3. Bivariable and multivariable logistic regression analysis of factors associated with disclosure status of HIV-positive children in Arsi zone public health facilities, Ethiopia, 2020 ($n=410$).

Variables	Category	Disclosure status		COR (95% CI)	p value	AOR (95% CI)	p value
		Yes (%)	No (%)				
Residence	Urban	147 (64.8)	80 (35.2)	Ref.			
	Rural	98 (39.1)	88 (52.7)	1.59 (1.07, 2.37)	0.022	1.63 (0.924, 2.87)	0.092
Duration on ART	<5 years	77 (46.1)	90 (53.9)	Ref.			
	6–15 years	168 (69.1)	75 (30.9)	2.61 (1.74, 3.94)	0.00	2.08 (1.013, 4.29)	0.046*
Age at child diagnosed HIV	<5 years	103 (45.4)	124 (54.6)	Ref.			
	≥ 5 years	142 (77.6)	41 (22.4)	0.240 (0.155, 0.370)	0.00	0.25 (0.126, 0.49)	0.000
Age of care giver/ parents	<30	23 (50)	23 (50)	1.82 (0.948, 3.498)	0.072	1.60 (0.64, 4.0)	0.313
	30–40	102 (57.3)	76 (42.7)	1.355 (0.88, 2.07)*	0.159	1.15 (0.64, 2.10)	0.65
	>40	120 (64.5)	66 (35.5)	Ref.			
Appropriate age of disclosure	6–12	140 (64.8)	76 (35.2)	Ref.		Ref.	
	≥ 12	105 (54.1)	89 (45.9)	1.56 (1.05, 2.323)	0.028	1.95 (1.09, 3.49)	0.025
History of hospitalization	Yes	77 (51.0)	74 (49.0)	1.77 (1.174, 2.67)*	0.06	1.92 (0.83, 4.42)	0.13
	No	168 (64.9)	91 (35.1)	Ref.			
Age of child	<11 years	43 (25.4)	126 (74.6)	15.18 (9.32, 24.70)*	0.00	4.5 (3.45, 8.38)	<0.001
	≥ 11 years	202 (83.8)	39 (16.2)	Ref.			
WHO clinical stage	I	192 (66.4)	97 (33.6)	0.442 (0.21, 0.94)*	0.035	0.37 (0.13, 1.09)	0.068
	II	28 (45.2)	34 (54.8)	1.06 (0.44, 2.55)	0.892	0.86 (.27, 2.77)	0.81
	III	11 (37.9)	18 (62.1)	1.43 (0.507, 4.04)	0.498	1.42 (0.36, 5.59)	0.61
	IV	14 (46.7)	16 (53.3)	Ref.		Ref.	
Income	<1000	70 (60.9)	45 (39.1)	Ref.		Ref.	
	1001–3000	139 (56.3)	108 (43.7)	1.21 (0.77, 1.89)	0.41	1.23 (0.65, 2.31)	0.53
	≥ 3001	36 (75.0)	12 (25.0)	0.59 (0.244, 1.01)	0.087	0.71 (0.26, 1.99)	0.52
History of OIS	Yes	69 (49.6)	70 (50.4)	Ref.			
	No	176 (64.9)	95 (35.1)	0.532 (0.351, 0.81)	0.03	1.4 (0.59, 3.20)	0.466
Educational status of parents/ caregivers	Unable to read and write	41 (50.6)	40 (49.4)	Ref.			
	Able to read and write	48 (58.5)	34 (41.5)	0.729 (0.391, 1.348)	0.310	1.18 (0.51, 2.73)	0.69
	Primary	71 (64.5)	39 (35.5)	0.563 (0.314, 1.01)	0.054	0.65 (0.23, 1.49)	0.31
	Secondary	49 (62.0)	30 (38.0)	0.628 (0.334, 1.178)	0.147	0.83 (0.35, 1.99)	0.68
	Diploma and above	36 (62.1)	22 (37.9)	0.626 (0.315, 1.244)	0.182	0.53 (0.96, 1.44)	0.213

* $p < 0.25$; ** $p < 0.01$.

Note: Bold in text indicate the variables which have association with outcome variable.

Similarly, the result of this findings was higher than study conducted in 33.3% in Ghana,⁴ 37% in Uganda,⁵ 33% in Tanzania,⁷ 11.1% in Western Kenya,⁹ 32.6% in Tanzania, COE in Mbeya,³ 33.3% in East Gojjam,¹⁰ 39.5% in Northwest Gondar,¹¹ and 44% in ART clinic in Gondar town.¹² The possible explanation might be due to the time frame in which the study was conducted. For example, the study in Northwest Gondar was conducted 11 years ago, in which the awareness creation regarding disclosure was poor. Similarly, a study in East Gojjem was conducted 7 years ago. In addition, the possible variation could be different segment populations. For instance, in a study conducted in Ghana, the study population was children who aged between 8 and 14 years, and the time frame the study conducted was in 2009. These differences could make a variation in the disclosure status.

The odds of HIV disclosure positive status among children who had ART follow-up 6–15 years were 2.08 times (AOR=2.08, 95% CI (1.013, 4.29)) higher than those who have ART follow-up <5 years. This study is supported by a study done in South Eastern Ethiopia.¹⁷ The possible explanation could be due to the reason that the children who had a history of prolonged stay on ART follow-up have a chance to ask questions about their HIV medications and why they take the drug which enables the parents/caregivers to disclose their status.

The likelihoods of HIV disclosure among children who were diagnosed at the appropriate age of ≥ 12 years were almost two times (AOR=1.95, 95% CI (1.09, 3.49)) more likely as compared to those diagnosed at the age of 6–12 years. The possible explanation might be due to the reason that as the age of children increased, the probability of asking about their disease will be increased. So, the parents/caregivers will be empowered to tell the result of their diagnosis for their children about the status. This finding is similar to a study done in East Gojjem, Gondar town, Bale, and Dire Dawa.^{10,12,17,18}

Likewise, the odds of disclosing HIV-positive status among children diagnosed at the age of <5 years had almost 75% (AOR=0.25, 95% CI (0.126, 0.49)) more folds as compared with children who were diagnosed at the age of ≥ 5 years. This is because early diagnosed children for their HIV-positive status had a greater opportunity to be disclosed early. In addition to this, early diagnosed children had a greater chance of linkage with the disclosure process and effective communication within families. This study is supported by the study conducted in Southeast Ethiopia which stated children diagnosed with HIV status age of <5 years had 2.8 times chance to be disclosed early when compared with children of age >6–11 years.¹⁷

Furthermore, the likelihoods of disclosure of their HIV-positive status among children aged below 11 years had 4.5 times (AOR=4.5, 95% CI (3.45, 8.38)) more as compared with their counterparts. If a child was diagnosed as having HIV positive, it is better to inform them at appropriate age based on their developmental status.

Limitation of the study

Difficult to identify the exact cause-and-effect relationship between dependent and independent variables as the study design was cross-sectional. Other limitation of this study was having only quantitative data.

Conclusion

The disclosure status of HIV-positive children was almost 6 in every 10 which is low in this study. ART follow-up for 6–15 years, children diagnosed at the appropriate age of ≥ 12 years, children diagnosed at the age of <5 years, and children who aged below 11 years were positively associated with disclosure status. Thus, we recommend healthcare providers and all stakeholders should give health education to the diagnosed based on the appropriateness of age. Overall, the health-care provider should focus on those factors during giving counsel and support about the disclosure to increase the prevalence of disclosure status.

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Authors' contributions

D.B.Y. and T.S.T. conceived the research idea and prepared the proposal, participated in the data collection process, analyze the data, and draft the article. B.W.G. and K.B. approved the proposal with some revisions, participated in the write-up process, and reviewed the article. All authors have reviewed and approved the last version of the article.

Availability of data and materials

The data used to support the findings of this study are in the hands of the corresponding author.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval and consent to participate

The protocol was approved by the Institutional Review Board (IRB) of the Arsi University (approved number A/CHS/RC/12/2019). Then the letter was sent to the managers of randomly selected public hospitals in East Arsi zone. Permission was attained from those concerned bodies. Furthermore, after a thorough discussion and explanations of the purpose, benefit, and possible risks of the study, written informed consent was secured from each study participant before enrolled to study.

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Informed consent

Concerning the informed consent form, written informed consent was obtained from all subjects before the study.

Trial registration

Regarding the trial registration, it is not applicable.

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Supplemental material

Supplemental material for this article is available online.

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