

Nutritional status and its associated factors among commercial female sex workers in Hawassa city, south Ethiopia

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Background. Commercial female sex workers (CFSWs) are individuals who regularly or occasionally trade sex for money. Sex work is mostly widespread in urban areas of the country. Data regarding commercial female sex worker's nutritional status was scanty at global level. The aim of this study is to assess nutritional status and its associated factors among CFSWs in Hawassa city, Ethiopia.

Methods. A facility-based mixed methods cross-sectional study design was used. The study was conducted in three key population clinics in Hawassa city. A total of 297 CFSWs were participated in the quantitative survey and 12 participants were involved in the qualitative study. Systematic random sampling methods for the quantitative and purposive sampling technique for the qualitative study were employed to select the study participants. Body mass index (BMI) was used to assess the nutritional status of sex workers. SPSS Statistics 20 and OpenCode 4.03 software were used for the quantitative and qualitative data analysis, respectively. Cross-classification analysis (X^2 -test) and multinomial logistic regression model were used. On MNL analysis, variables with a P value of < 0.05 were considered as significantly associated with underweight or overweight/obese.

Results. The prevalence of underweight and overweight/obesity among female commercial sex workers in Hawassa city were 14.1% and 16.8%, respectively. In underweight category keeping normal as reference, living alone (AOR= 0.186, 95%CI: 0.043, 0.804), chewing Khat regularly (AOR= 0.233, 95% CI: 0.063, 0.866), using substance or drugs regularly (AOR= 10.577, 95% CI: 2.587, 43.243), using drugs in exchange of sex (AOR= 4.971, 95% CI: 1.279, 19.322) and HIV positive status (AOR= 21.649, 95% CI: 5.862, 79.950) were statistically significant predictors of underweight compared to normal BMI among CFSWs. In overweight category keeping normal as reference, having other work than sex work (AOR= 0.108, 95% CI: 0.033, 0.358), average daily income (AOR= 3.023, 95% CI: 1.205, 7.586), category of sex worker or usual place of sex (AOR= 12.357, 95% CI: 3.839, 39.777) and presence of any chronic illness (AOR= 5.157, 95% CI: 1.800, 14.775) were four statistically significant predictors of overweight/obese compared to normal BMI among CFSWs. In this study, it was also explored that lack of money and food was the main cause to start sex work among in-depth interview participants.

Conclusions. Commercial female sex workers in this study faced double burden of malnutrition. Multiple factors influence their nutritional status. Government and other partners should play an important role in providing comprehensive programs, improving their socioeconomic status, and strengthening and scale-up the initiatives at sex workers' clinics.

1 1. INTRODUCTION

2 Female sex workers are defined in the Ethiopian context as females who regularly or
3 occasionally trade sex for money in drinking establishments, night clubs, local drinking houses,
4 Khat and “shisha” houses, on the street, around military and refugee camps, construction sites,
5 trade routes, red light districts and at their homes (FHAPCO, 2015, EPHI *et al.*, 2014).
6 According to recent estimates, there are about 200,000 female sex workers in Ethiopia
7 (PEPFAR, 2018). In a study conducted in 89 towns **in Ethiopia**, a total of 85,294 **female sex**
8 **workers were counted. One-third of the female sex workers were non-self-identified**
9 **(Girma *et al.*, 2014)**. It has been reported that girls from Ethiopia’s impoverished rural areas are
10 exploited in domestic servitude and commercial sex within the country (U.S, 2017). In Ethiopia,
11 71% of female sex workers are mostly young between the age of 15-24 (FHAPCO, 2015).

12 The UN has specifically acknowledged special attention to be given to the health needs and
13 rights of women belonging to vulnerable groups, including those ‘in prostitution’ (UNCEDAW,
14 1999). And it was recommended that states parties should take measures to fully protect persons
15 working in the sex industry against all forms of violence, coercion, and discrimination
16 (UNCECR, 2016). According to UNAIDS report, although thousands of studies on sex work
17 have been undertaken on the health problems of sex workers, we do not know much on nutrition
18 related burden of sex works (UNAIDS, 2014).

19 Nutrition plays an important role for female sex workers living with HIV in sub-Saharan Africa
20 (Lancaster *et al.*, 2016). Sex workers are among the key populations most affected by HIV and
21 STIs. Globally, the average HIV prevalence among sex workers is estimated to be approximately
22 12% (WHO, 2012). The overall estimated HIV prevalence was 33% and among female sex
23 workers 25 years or older was 44% in Kampala (Hladik *et al.*, 2017). Whereas in Ethiopia, HIV
24 prevalence is reported to be 23% among female sex workers in 2013 (EPHA *et al.*, 2013).

25 Sex workers cannot take food properly due to their addiction, floating habit, and lack of money
26 (Huq *et al.*, 2013). Coercion is very common and many sex workers are required to work in the
27 sex business because they need the money to support their families (Hengartner *et al.*, 2015).
28 Adolescents who are forced to become commercial sexual exploitation of women and children
29 suffer multiple forms of abuse, which may be life-threatening (Bagley *et al.*, 2017). Legal issues,
30 stigma, discrimination and violence pose barriers to HIV services for sex workers (UNAIDS,

31 2012). Policy reforms to remove punitive approaches to sex work, ensure supportive workplace
32 standards and policies, and foster SWs' ability to work collectively are recommended
33 (Goldenberg *et al.*, 2015).

34 Most of the street-based sex workers are very young, mainly dominated by the illiterate and
35 married women. They are paid a little amount of money and they have taken greater than 3
36 clients per night but spent very few amount of money for health purpose (Mondal *et al.*, 2010).
37 The main reason for accepting sex selling profession it was found that more than half, of the
38 respondents were bluffed and respondents accepted this profession of their own will (Mahejabin
39 *et al.*, 2014).

40 The cut-offs for underweight is BMI under 18.5 kg/m², normal weight is BMI greater than or
41 equal to 18.5 to 24.9 kg/m² and Overweight/ Obesity is BMI greater than or equal to 25 kg/m²
42 (WHO, 2004). In the study conducted in Bangladesh, prevalence of underweight and
43 overweight/obesity among female sex workers was 22.8% and 16.3%, respectively (Kawser *et al.*,
44 2020). In another study conducted in Bangladesh, more than 57% of the drug addicts and sex
45 workers were suffering from various degrees of chronic energy deficiency and 4% were
46 overweight (Huq *et al.*, 2013). Nutrition related burden of sex workers was not studied in
47 Ethiopia; however, based on analysis of EDHS 2016, the prevalence of underweight among
48 reproductive age group women in Ethiopia was 17.6% (Kassie *et al.*, 2020). The prevalence of
49 malnutrition among PLHIV were found to be 60% (Nigusso and Mavhandu-Mudzusi, 2021). The
50 prevalence of under-nutrition and overweight/obesity was 29.3% and 2.4% among PLWHA in
51 Bahir Dar city. Of them, 29.6% of female participants were undernourished (Hussien *et al.*,
52 2021).

53 Being home-based female sex workers and no mass media exposure were found to be
54 significantly associated with underweight (Kawser *et al.*, 2020). Malnutrition among PLHIV was
55 found strongly associated with: female gender; urban residence; income below 53.2 USD; poor
56 asset possession; duration of less than one year on ART; and recurrent episodes of opportunistic
57 infections (Nigusso and Mavhandu-Mudzusi, 2021). There is a statistically significant
58 association between BMI ≥ 25 and hypertension (Tesfa and Demeke, 2021). Comorbid
59 hypertension, family history of overweight and obesity, higher income tercile, physical inactivity
60 and residence area were significantly associated with overweight/obesity (Abdissa *et al.*, 2021).
61 Similarly, being home-based sex workers, <26 years of age, one-time coital frequency with

62 normal clients, 1 to 7 days monthly absence from sex work, no alcohol consumption, drug habit,
63 monthly income greater than 90 USD were found to be significantly associated with
64 overweight/obesity (Kawser *et al.*, 2020). Chronic substance use affects a person's nutritional
65 status and body composition through decreased intake, nutrient absorption, and dysregulation of
66 hormones that alter the mechanisms of satiety and food intake (Mahboub *et al.*, 2020). Street-
67 based sex workers are suffering from different types of health complications. Very young,
68 married and illiterate women are serving the sex trade containing severe health hazards (Mondal
69 *et al.*, 2010).

70 Dietary diversity of sex workers had not been assessed well. In a study conducted among
71 pregnant and lactating women, the proportion of women meeting the MDD-W was low across all
72 7 time periods, ranging from 12.9% to 20.3% (Anyanwu *et al.*, 2021). The proportion of women
73 meeting the minimum dietary diversity score vary seasonally, corresponding to the consumption
74 of 5 out of 10 food groups (Baye *et al.*). Where as in a study conducted in Kenya among women
75 of reproductive age, over 75% of the women consumed foods from fewer than five food groups,
76 thus not meeting the MDD threshold (consumption of five or more food groups) (Gitagia *et al.*,
77 2019).

78 Sex workers need accessible, acceptable and good-quality medical care at all levels, which may
79 be provided through a variety of channels such as sex worker-led services including clinical
80 services, harm reduction and drug treatment services, and integrated services at sexual and
81 reproductive and primary health-care centers (WHO, 2012). Given the importance of poor
82 socioeconomic status, less access to hygienic environment, risky sexual behaviors, drug habit,
83 alcohol consumption, and infection-prone status of commercial female sex workers; the aim of
84 this study is to assess nutritional status of commercial sex workers and to identify its associated
85 factors in Hawassa city in Ethiopia.

86 **2. MATERIALS & METHODS**

87 **2.1. Study sites, design and study participants**

88 The study was conducted to assess nutritional status of commercial female sex workers and to
89 determine factors associated with underweight and overweight/obesity. This study was
90 conducted in Hawassa city, Sidama region, Ethiopia. The city is located on the shores of Lake
91 Hawassa in the Great Rift Valley, 273 kms south of Addis Ababa, the capital city of Ethiopia. It

92 lies on the Trans-African Highway for Cairo-Cape Town and has a latitude and longitude of
93 7°3'N and 38°28'E coordinates and an elevation of 1,708 meters above sea level. Based on the
94 projection of 2007 census conducted by the Central Statistical Agency of Ethiopia, the city has
95 an estimated total population of 442,900 in 2021. There are two government and one NGO
96 owned commercial female sex workers clinics in the city which provide a confidential and
97 comprehensive health services for only female sex workers and their partners. The clinics are
98 key population clinics in Adare General Hospital and Millennium Health Center and confidential
99 clinic of Family Guidance Association of Ethiopia. A facility-based mixed method cross-
100 sectional study design using both quantitative and qualitative methods was conducted from
101 December 2021 to January 2022. In quantitative survey, data collection was conducted using
102 structured and pre-tested interviewer-administered questionnaire and in-depth and key informant
103 interviews were used in the qualitative part to complement the quantitative survey. Commercial
104 female sex workers whose age were greater than 18 years and who gave informed consent
105 included in the study and commercial female sex workers who were pregnant and lactating,
106 seriously ill, drunk and unable to respond on the date of data collection were excluded from the
107 study. A total of 297 female sex workers and 12 participants were surveyed in the quantitative
108 and qualitative study, respectively. Systematic random sampling methods for the quantitative and
109 purposive sampling technique for the qualitative study were employed to select the study
110 participants.

111 **2.2. Sample Size Determination**

112 Sample size was determined by using EPI INFO version 7. For sample size calculation we used
113 the significance level of study 95% and degree of precision (d=0.05).

$$114 N = (z_{1-\alpha/2})^2 p (1-p) / d^2$$

115 Where; $p=0.228$, $Z=95\%$, $d=5\%$

116 Prevalence of under-nutrition ($p=22.8\%$) (Kawser *et al.*, 2020)

117 Therefore, $N = 271$;

118 Adding non-response rate of 10% on calculated sample size, the final sample size required for
119 this study was 298.

120 **2.3. Data collection instrument and methods**

121 **2.3.1. Quantitative data**

122 For quantitative survey, data was collected using pretested and interviewer administered
123 questionnaire. The interview questionnaire contains demographic and socioeconomic
124 characteristics, personal behaviors, risky sexual behaviors and health practices. Based on the
125 findings from pretest, the questionnaire was modified.

126 **2.3.2. Qualitative data**

127 For qualitative survey, questionnaire guided in-depth and key informant interview guides were
128 used. The interview was recorded using Sony digital voice recorder. Individuals who took part in
129 the quantitative data collection were not included in the qualitative study.

130 **2.3.3. BMI assessment**

131 After the completion of the interview, body weight was measured to the nearest 0.1kg, wearing
132 no shoes with light clothing, on a portable weighing scale. Standing height was measured with a
133 wall-mounted scale to the nearest 0.1cm, with the head in the Frankfurt horizontal plane, while
134 standing straight on a horizontal surface with heels together, the shoulders relaxed, arms at the
135 sides and without shoes. Height and weight were used to calculate Quetelet index or Body Mass
136 Index, $BMI = \text{weight}(\text{kg}) / \text{height}(\text{m}^2)$. The classifications of BMI applied in this study were
137 recommended by the World Health Organization. BMI values of $<18.5 \text{ kg/m}^2$ and $\geq 25 \text{ kg/m}^2$
138 represented underweight and overweight/obese, respectively (WHO, 2004).

139 **2.3.4. Dietary intake assessment**

140 Using a quantitative 24-h recall, based on FAO and FHI 360 guide to measurement, food intake
141 was estimated. Minimum dietary diversity for women (MDD-W) is a dichotomous indicator of
142 whether or not women 15-49 years of age have consumed at least five out of ten defined food
143 groups the previous day or night. The proportion of women 15-49 years of age who reach this
144 minimum can be used as a proxy indicator for higher micronutrient adequacy, one important
145 dimension of diet quality. The ten food groups are: (1) Grains, white roots and tubers, and
146 plantains; (2) Pulses (beans, peas and lentils); (3) Nuts and seeds; (4) Dairy; (5) Meat, poultry

147 and fish; (6) Eggs; (7) Dark green leafy vegetables; (8) Other vitamin A-rich fruits and
148 vegetables; (9) Other vegetables and (10) Other fruits (FAO and FHI 360, 2016).

149 **2.4. Ethics**

150 Ethical clearance to conduct the study was obtained from Hawassa University, School of
151 Graduate Studies (ref No: IRB/021/14). Permission to carry out the study was obtained from the
152 respective administrative bodies and study facilities. A verbal consent was obtained from study
153 participants. All questionnaire and consent forms were translated to Amharic language before the
154 survey.

155 **2.5. Quality control**

156 The quantitative data collection was conducted by five trained health care providers. The
157 enumerators were experienced health professionals (nurses and health officer), fluent in Amharic
158 and working in sex workers clinics. A three days training was provided and the questionnaire
159 was pre-tested in Drop-in-Center in Hawassa. Collected data was cross checked for content
160 validity and completeness. The entire in-depth and key informant interview sessions were carried
161 out by the principal investigator during the quantitative data collection period.

162 **2.6. Statistical analyses**

163 A statistical software package IBM SPSS version 20.0 was employed to analyze the data. Before
164 performing analysis, normality test of the BMI was done by Kolmogorov–Smirnov (K–S)
165 goodness of fit test. Data was coded, transformed, and cleaned for further analysis. The results
166 were presented in the form of tables, figures and texts using frequencies and summary statistics
167 such as median, mean, standard deviation and percentage to describe the study population in
168 relation to relevant variables. Cross-classification analysis (χ^2 -test) was used to examine possible
169 associations between socio-demographic and other predicting factors for BMI (kg/m^2).
170 Multinomial logistic regression (MNLR) model was used to predict the independent factors
171 associated with the prevalence of nutritional status of commercial female sex workers and a P
172 value of < 0.05 set as significance. The level of nutritional status was the outcome variables with
173 3 categories (underweight, normal, overweight/obese). Likelihood ratio test, goodness-of-fit,
174 Pseudo R-square and classification table was considered for model fitting (as shown in Annex 1).

175 For the qualitative part, data collected by in-depth and key informant interviews through Sony
176 digital voice recorder. It was analyzed using OpenCode version 4.03 software. The audio data
177 was directly translated from digital recorder in to English. The translated word document was
178 converted in to plain text format. The plain text format of the translated content was transported
179 into OpenCode and then coded, categorized into sub-thematic areas and analyzed by
180 predetermined themes using thematic analysis approach. A triangulation protocol was used and
181 some quotes from the qualitative data that best explain the objective were identified and
182 presented by the participants own words in parallel with the quantitative information to give
183 more insight for the study.

184 **3. RESULTS**

185 A total of 297 commercial female sex workers from three female sex workers clinics in Hawassa
186 city were included in the study with response rate of 99.6%. One sex worker refused to
187 participate in the study. The median age of the study subjects was 25 years old. About one out of
188 five sex workers were not attended any formal education. Half of the respondents were single,
189 40% were divorced/separated/widowed and 9.1% were married. More than one-third of
190 participants had other work than sex work. One-hundred thirty sex workers had one or more
191 children. However, 70.8% of sex workers, who had children, had given their children to their
192 parents/relatives and the rest were living with their children. More than half of sex workers had
193 estimated average daily income more than or equal to 500 ETB. About half of sex workers were
194 living with other female sex workers. The respondents' socio-demographic characteristics are
195 presented in Table 1.

196 As shown in Table 2, four out of five sex workers drink alcohol regularly, three out of four chew
197 'Khat' regularly and one out of ten smoke cigarettes regularly. In addition to that, 30.0% of
198 female sex workers use substances or drugs like Cannabis (powder/injection), 'Shisha' and
199 'Ganja'. And, 11% of sex workers use substance in exchange of sex. About 44% of sex workers
200 didn't use any mass media.

201 Lack of money or poverty was the major reasons to start sex work. Among study participants,
202 68.7% start sex work because of lack of money or poverty. As show in Table 3, 18.5% of
203 respondents started sex work before 18 years of age. About two-third of the respondents had
204 experience of sex work for less than four years. Commercial female sex workers are mainly
205 categorized based on their usual place of sex. Half of sex workers were hotel-based sex

206 workers, 43.8% were street-based sex workers and only 6.4% were home-based sex workers. In
207 the last seven days prior to the survey, 81.1% of female sex workers worked for more than two
208 days last week. Majority, 68.4% of female sex workers had sex with at least two clients per day
209 on average. Though their coital frequency depends on the ability of their clients to pay, 80.5%
210 had more than one coitus per client. About one-third, 34.3% of female sex workers had non-
211 paying clients/permanent partners. However, 27.3% of sex workers in this study had no regular
212 and consistent use of condom.

213 In this study, 81.8% of female sex workers had used modern contraceptive method during the
214 data collection period. About 29% of female sex workers had experienced incidence of abortion
215 in the past. Most, 84.5% of female sex workers in this study had no access to water and soap
216 after sex. From the total respondents, 41.1% of respondents had history of sexual transmitted
217 diseases and 16.8% of them were self-reported HIV positive status. In this study, 17.5% of
218 female sex workers had reported presence of known chronic illness like hypertension, diabetes
219 mellitus and others (shown in Table 4).

220 About 55.6% of female sex workers achieved minimum dietary diversity as computed by greater
221 than or equal to five food groups and they are more likely to have higher (more adequate)
222 micronutrient intakes than the 44.6% of CFSWs who did not. The mean IDDS was 4.75 (SD =
223 1.497). About 86.2% of participants reported that they had consumed starchy staples (grains
224 and/or white root and tubers) yesterday, 49.8% reported consuming pulses yesterday and only
225 12.8% reported consuming nuts and seeds yesterday. Regarding animal source food, 25.3 percent
226 consumed milk and milk products, about half consumed meat, poultry and fish and 22.9 percent
227 consumed egg yesterday. Similarly, four out of five sex workers reported consuming dark green
228 leafy vegetables yesterday, one-third consumed vitamin A-rich fruits and vegetables yesterday,
229 82.5% other vegetables yesterday and 35.7% consumed other fruits yesterday. Food group
230 consumed yesterday by CFSWs in Hawassa city was shown in Figure 1.

231 The mean (SD) height and weight of the female sex workers was 160.7 cm (\pm 7.34) and 56.6 kg
232 (\pm 9.16), respectively. In the total prevalence of BMI categories, it was observed that majority of
233 the sex workers, 69.0% had normal BMI, whereas 14.1% were underweight and 16.8% were
234 overweight/obese. The mean BMI was 21.9 kg/m² (SD=3.13) with minimum and maximum BMI
235 of respondents were 14.5 and 32.3, respectively.

236 In the normal vs underweight model, with whom living with (AOR= 0.186, 95% CI: 0.043,
237 0.804), P= 0.024), chew Khat regularly (AOR= 0.233, 95% CI: 0.063, 0.866), P= 0.030), use
238 substance or drugs regularly (AOR= 10.577, 95% CI: 2.587, 43.243), P= 0.001), use drugs in
239 exchange of sex (AOR= 4.971, 95% CI: 1.279, 19.322), P= 0.021) and HIV status (AOR=
240 21.649, 95% CI: 5.862, 79.950), P< 0.001) were five significant predictors those influence
241 underweight among CFSWs (as shown in Table 5).

242 Similarly, in the normal vs overweight/obese model, having other work than sex work (AOR=
243 0.108, 95% CI: 0.033, 0.358, P < 0.001), Average daily income (AOR = 3.023, 95% CI: 1.205,
244 7.586, P= 0.018), category of sex worker or usual place of sex (AOR = 12.357, 95% CI: 3.839,
245 39.777, P < 0.001) and presence of any chronic illness (AOR = 5.157, 95% CI: 1.800, 14.775, P
246 = 0.002) were four significant predictors those influence overweigh/obese among CFSWs.

247 Major themes identified from the in-depth and key informant interviews were socioeconomic
248 factors, behavioral factors, risky sexual behaviors, health-hygiene practices and dietary practices.

249 **4. DISCUSSION**

250 The prevalence of underweight and overweight/obesity among CFSWs in Hawassa city were
251 14.1% and 16.8%, respectively. The prevalence of underweight in this study is lower than study
252 conducted in Dhaka city which was 22.8%; however, the prevalence of overweight/obese was
253 consistent with that of Dhaka city which was 16.3% (Kawser *et al.*, 2020). However, in another
254 study conducted on nutritional status among drug addicts and sex workers in Dhaka city in
255 Bangladesh, the prevalence of chronic Energy Deficiency (CED) was much higher than this
256 study which was 57% and the prevalence of overweight/obese was much lower than this study
257 which was 4% (Huq *et al.*, 2013). This might be due to the drug addict groups included in that
258 study in addition to sex workers.

259 The probability of living alone to be underweight with respect to having normal BMI was 0.175
260 times (81.5%) lower than those who live with other CFSWs. In the study conducted in
261 Bangladesh, the living status of CFSWs was not associated with neither underweight nor
262 overweight/obese (Kawser *et al.*, 2020). Those sex workers who live with other sex workers may
263 share everything in common including meals and there would be peer pressure when sex workers
264 live together in common house which might predispose to different risky behaviors including
265 risky sexual behaviors. Sex workers usually eat their meals outside their home in hotels or
266 restaurants. In addition to that most of them also share foods and eat together. In in-depth

267 interview, a 19-years-old sex worker said, *‘We share foods for three, because it is difficult to*
268 *afford separately. We share costs to buy food staffs like ‘Injera’ and onion.’*

269 CFSWs who chew Khat regularly were 0.24 times (76.0%) lower than to be underweight with
270 respect to having normal BMI than who didn’t chew Khat. As a recreational drug, the leaves are
271 chewed by people in most East African countries including Ethiopia to elevate mood.

272 Interestingly, the better nutritional status among regular Khat chewing sex workers was observed
273 in this study. This might be due to Khat chewing sex workers might sit for long period in Khat
274 chewing places which might result in a sedentary life which can brought weight gain. In in-depth
275 interview, a 35 years old sex worker in Adare General Hospital said, *‘When we got money, we*
276 *went out and eat and drink together with our friends. Then, we came back to our rooms and*
277 *chew Khat until evening. That is all.’*

278 Similarly, in underweight category keeping normal category as reference category, sex workers
279 who use substance/drugs and use substances/drugs in exchange of sex were 11.704 and 4.195
280 times more likely to be underweight, respectively. In the study conducted on nutritional status
281 among sex workers and drug addicts, the prevalence of malnutrition among drug addicts was
282 62% (Huq *et al.*, 2013). Though, this study didn’t determine factors associated with malnutrition
283 among sex workers, the high prevalence of malnutrition among these groups could be an
284 indication for likelihood of possible association with malnutrition. In another study conducted in
285 Dhaka city, CFSWs addicted with cannabis were fund to be significantly associated in the
286 second model. CFSWs addicted with cannabis were decreased the probability of being
287 overweight/obesity relative to normal BMI (Kawser *et al.*, 2020). In the narrative review, chronic
288 substance use affects a person’s nutritional status and body composition through decreased
289 intake, nutrient absorption, and dysregulation of hormones that alter the mechanisms of satiety
290 and food intake (Mahboub *et al.*, 2020). Sex workers expend small portion from their daily
291 income for food. And, they reduce frequency and amount of their meals too. In key informant
292 interview in this study, a service provider in Millennium health center said, *‘I realize that it*
293 *would be better for their health if they expend more money for food than Khat and drugs. Most of*
294 *them expend their money for their addictions.’* Sex workers use alcohol, Khat or drugs/substance
295 every day. It’s part of their life. The health officer in Millennium KP clinic said, *‘Sex workers*
296 *usually wake up from sleep lately in the morning and then, they eat breakfast. After breakfast,*

297 *they chew Khat and smoke Shisha in a group. Some of them may smoke cigarette. Then, they*
298 *start drinking early in the evening.'*

299 According to this study self-reported HIV status was statistically strongly associated with
300 underweight among sex workers. Sex workers with positive HIV status had 32 times higher odds
301 ratio to be underweight as compared to HIV negative sex workers. The prevalence of
302 malnutrition among PLWHA was high in Ethiopia (Hussien *et al.*, 2021; Nigusso and
303 Mavhandu-Mudzusi, 2021); this could be the reason for strong association with undernutrition
304 among sex workers in this study. In the qualitative part of this study, it was explored that
305 sexually transmitted disease and HIV are the most common illness among commercial female
306 sex workers. A peer educator in Adare general hospital said, '*sexually transmitted disease and*
307 *HIV are the most common infections observed among sex workers.'* However, most HIV positive
308 sex workers hardly adhere to ART treatment. A 30-year-old sex worker said, '*I was tested HIV*
309 *positive six years ago. But I gave birth to HIV negative child.... There are also many HIV*
310 *positive sex workers. And, some sex workers who are on ART medical treatment put their drug in*
311 *my home in secret.'* Sex worker in Millennium health center also said, '*HIV positive individuals*
312 *in particular sex workers do face shortage of food while receiving their drugs. Though they take*
313 *medicine daily, they have several addictions and no food to eat. Because of this, they throw away*
314 *their medicine.'*

315 In overweight category keeping normal as reference, it is obtained that having other work than
316 sex work were 0.11 times (89%) less likely to be overweight/obese as compared to those who
317 had no other work than sex work. Study conducted on factors associated with body mass index
318 of government employee in Nepal showed that those who did not exercise were more likely to be
319 obese compared to those who did exercise (Tharu and Mahatra, 2021). As a result, having other
320 work other than sex work might have an equivalent effect as exercise. Those sex workers who
321 had additional work than sex work mainly engaged in works like waitress in hotels and
322 restaurants, broker agent, small business and cleaning, making beds & washing bed sheets and towels
323 in hotels and pensions.

324 Similarly, in overweight category keeping normal as reference, those who had average daily
325 income less than or equal to 500 ETB were 3.0 times more likely to be overweight/obese
326 compared to those who had average daily incomes less than 500 Birr. This finding was
327 inconsistent with study conducted in Dhaka city (Kawser *et al.*, 2020). Those who had better

328 daily income (monthly income) would have higher socio-economic status which might have a
329 better nutritional status in this study.

330 In addition to that, in overweight category keeping normal as reference, hotel-based or home-
331 based sex workers were 12.256 times more likely to be overweight/obese compared to street-
332 based sex workers. This result is supported by the study conducted in Bangladeshi (Kawser *et al.*,
333 2020) in which hotel/home-based sex workers were more likely to be overweight/obese. This
334 might be due to that hotel/home-base sex workers had more stable work environment compared
335 to street-based sex workers. In the KII, the peer educator in Adare General Hospital also said,
336 *'By the way, there is status difference among hotel-based and street-based sex workers. hotel-
337 based sex workers may get income in thousands of Birr, but street-based sex workers paid the
338 least and home-based sex workers might also get paid double including their room fee.'*

339 In model 2, in overweight category keeping normal as reference, it was also observed that sex
340 workers with presence of known chronic illness had 5.078 times higher odds ratio to be
341 overweight/obese as compared to sex workers with no known chronic illness. This finding was
342 consistent with other findings in Ethiopia. In the meta-analysis conducted in Ethiopia, the pooled
343 meta-regression analysis showed that there is a statistically significant association between BMI
344 ≥ 25 and hypertension (Tesfa and Demeke, 2021). In the study conducted in southwest Ethiopia,
345 it revealed high prevalence of overweight/obesity among study participants. It was found that
346 comorbid HTN, family history of overweight and obesity were significantly associated with it
347 (Abdissa *et al.*, 2021). In the qualitative part, it was identified that no nutrition counseling was
348 provided for sex workers in all the three facilities included in this study. The training package of
349 key population service provider has several components but, nutrition counseling and
350 intervention was not incorporated in the training and service packages for key population service
351 providers. For one of the questions related with nutrition counseling which says 'Have you ever
352 obtained any nutrition counseling, nutrition related intervention from service providers from the
353 clinic?' All of them replayed, 'No!'

354 **5. CONCLUSIONS**

355 Commercial female sex workers in this study faced double burden of malnutrition. The
356 prevalence of underweight and overweight/obesity among CFSWs in Hawassa city were 14.1%
357 and 16.8%, respectively. Socio-demographic, lifestyle and health factors influenced the
358 nutritional status of CFSWs. Living with other sex workers, not chewing Khat regularly, use of

359 substance or drugs regularly, use drugs in exchange of sex and HIV status were associated with
360 underweight among CFSWs. In addition to that, not having other work, higher daily income,
361 being hotel/home-based sex worker and presence of chronic illness were associated with
362 overweight or obese among CFSWs in this study.

363 Lack of money and food was the main cause to start sex work among in-depth interview
364 participants in this study. There is status difference between hotel/home-based and street-based
365 commercial sex workers. Hotel/home-based sex workers had better income and safety than
366 street-based sex workers. Use of alcohol, Khat and substances is their routine life. HIV and STI
367 were the most common illnesses among sex workers in this study. In addition to that, this study
368 also explored lack of nutrition counseling, services and interventions for commercial female sex
369 workers at the health facilities.

370 **ACKNOWLEDGEMENTS**

371 First of all, our special thanks go to almighty God. And, also thanks to School of Nutrition, Food
372 Science and Technology of Hawassa University for administrative supports. We would also like
373 to thank staff members of Adare General Hospital, Millennium Health Center and Family
374 Guidance Association of Ethiopia, Southern Area Office for their support during data collection.
375 Finally, we would like to thank participants of this study who were willing to cooperate during
376 data collection.

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472

Table 1 (on next page)

Socio-demographic characteristics of CFSWs in Hawassa city in 2022

Variables	Frequency (n=297)	Percentage (%)
Age (years)		
< 25	139	46.8
25-29	116	39.1
>= 30	42	14.1
Median age (SD) = 25.0 (5.07)		
Educational status		
No education	52	17.5
Primary education	125	42.1
Secondary education	115	38.7
College and above	5	1.7
Marital status		
Single	151	50.8
Married	27	9.1
Divorced/separated/ widowed	119	40.0
Having work other than sex work		
Yes	108	36.4
No	189	63.6
Having children		
Yes	130	43.8
No	167	56.2
Average daily income		
< 500 ETB	126	42.4
>= 500 ETB	171	57.6
Average daily expense		
< 500 ETB	265	89.2
>= 500 ETB	32	10.8
With whom living with		
Alone	106	35.7
Children/husband	49	16.5
Other CSWs	142	47.8

Table 2 (on next page)

Behavioral factors of CFSWs in Hawassa city in 2022

Variables	Frequency (n=297)	Percentage (%)
Drink alcohol regularly		
Yes	236	79.5
No	61	20.5
Currently smoke		
Yes	62	20.9
No	235	79.1
Chew Khat		
Yes	218	73.4
No	79	26.6
Use substances/drugs		
Yes	89	30.0
No	208	70.0
Use substance in exchange of sex		
Yes	33	11.1
No	264	88.9
Major mass media exposure		
Nothing	131	44.1
TV/Radio	113	38.0
Social media (Facebook, telegram etc.)	53	17.9

1

Table 3 (on next page)

Sexual behavioral factors of CFSWs in 2022

Variables	Frequency (n=297)	Percentage (%)
Reason for sex work		
Lower economy/poverty	204	68.7
Peer pressure	69	23.2
Other reasons (harassment, exploitation)	24	8.1
Years of experience in sex work		
< 4 years	192	64.6
>= 4 years	105	35.4
Age entering in to sex work		
>= 18 years	242	81.5
< 18 years	55	18.5
Number days worked in the last 7 days		
< 3days a week	56	18.9
>= 3 days a week	241	81.1
Category of sex workers (usual place of sex work)		
Hotel based	148	49.8
Home based	19	6.4
Street based	130	43.8
Client per day		
One client	94	31.6
>= Two clients per day	203	68.4
Coital frequency per clients		
One coitus per client	58	19.5
>= 2 coitus per client	239	80.5
Non-paying partners (client)		
Yes	102	34.3
No	195	65.7
Regular & consistent condom use		
Yes	216	72.7
No	81	27.3

Table 4(on next page)

Health and hygiene related practice of CFSWs in 2022

Variables	Frequency (n=297)	Percentage (%)
Use of modern contraceptive		
Yes	243	81.8
No	54	18.2
History of abortion		
Yes	87	29.3
No	210	70.7
Access to water and soap after sex		
Yes	251	84.5
No	46	15.5
History of STI		
Yes	122	41.1
No	175	58.9
HIV status		
Positive	50	16.8
Negative	247	83.2
Presence of known chronic illness		
Yes	52	17.5
No	245	82.5

1

Table 5 (on next page)

Multinomial logistic regression analysis of factors associated with nutritional status among CFSWs.

Explanatory variables	Normal BMI verses underweight					Normal BMI verses overweight/obese				
	B	Odds ratio	95% CI		<i>p</i> -value	B	Odds ratio	95% CI		<i>p</i> -value
			Lower	Upper				Lower	Upper	
Intercept	-1.281					-3.637				
Age (years)										
19-24	-.722	.486	.072	3.265	.458	-.806	.447	.091	2.191	.321
25-29	-1.526	.217	.035	1.351	.102	1.108	3.027	.845	10.843	.089
>= 30										
Having other work										
Yes	.181	.835	.283	2.460	.743	-2.224	.108***	.033	.358	.000
No										
Average daily income										
< 500 ETB	.802	2.231	.735	6.769	.157	1.106	3.023*	1.205	7.586	.018
>= 500 ETB										
Years of experience										
< 4 years	.291	1.338	.344	5.201	.674	-.527	.591	.217	1.610	.030
>= 4 years										
With whom living with										
Alone	-1.683	.186*	.043	.804	.024	.220	1.247	.470	3.304	.658
Children/husband	-1.194	.303	.064	1.429	.131	.474	1.607	.448	5.770	.467
Other CFSWs										
Drink alcohol regularly										
Yes	-.539	.584	.142	2.405	.456	-.244	.784	.263	2.332	.661
No										
Chew Khat regularly										
Yes	-1.455	.233*	.063	.866	.030	-.423	.655	.222	1.935	.444
No										
Use substances/drugs regularly										
Yes	2.359	10.577*	2.587	43.243	.001	-.856	.425	.123	1.468	.176
No										
Use drugs in exchange of sex										
Yes	1.604	4.971*	1.279	19.322	.021	.880	2.241	.499	11.639	.274
No										
Use mobile for catching clients										
Yes	.669	1.953	.557	6.851	.296	.564	1.758	.609	5.077	.297
No										

Usual place of sex											
Hotel/home based	-1.096	.334	.110	1.013	.053	2.514	12.357***	3.839	39.777	.000	
Street based											
Use any modern contraceptives											
Yes	-.669	.512	.155	1.691	.272	-.142	.868	.217	3.469	.841	
No											
HIV status											
Positive	3.075	21.649***	5.862	79.950	.000	.139	1.149	.347	3.809	.820	
Negative											
Presence of any chronic illness											
Yes	1.000	2.719	.601	12.300	.194	1.640	5.157*	1.800	14.775	.002	
No											

1 $*p < 0.05$; $**p < 0.01$; $***p < 0.001$

Figure 1

Food groups consumed yesterday by CFSWs in Hawassa city in 2022

