Background

Cancer is the second leading cause of death worldwide accounting for 8.7 million deaths globally in 2015 and 17.5 million new diagnoses with a 33% increase in cases between 2005 and 2015 [1

and June 2015. Written informed consent was sought from the selected individuals and confidentiality was maintained by all personal identifiers delinked by coding. The study protocol was approved by Kenya Medical Research Institute's Ethics Review Committee (SSC No. 2607).

Table 1 Sociodemographic characteristics, screening awareness and behaviors by unscreened and screened (/)

Characteristic	Cervical Cancer Screened			
	Unscreened (%)	Screened (%)	Total (%)	Uncorrected Pearson Chi2
/	*86 (83.6)*	*1 4 (16.4)*	*1180 (100)*	
Episodic alcohol drinking				
No alcohol	952 (84.4)	176 (15.6)	*1128 (5.8)*	chi2(2) = 12.16, = 0.134
Binge drinking	18 (66.1)	9 (33.9)	28 (2.4)	
Non-heavy drinking	16 (66.0)	8 (34.0)	24 (2)	
/	*84 (83.6)*	*1 4 (16.4)*	*1178 (100)*	
Inadequate fruits and vegetables				
No	691 (80.8)	164 (19.2)	855 (72.5)	chi2(1) = 17.28, = 0.001
Yes	296 (90.9)	30 (9.1)	325 (27.5)	
/	*86 (83.6)*	*1 4 (16.4)*	*1180 (100)*	
Excess sugar				
No	168 (90.7)	17 (9.3)	186 (15.8)	chi2(1) = 8.10, = 0.024
Yes	818 (82.3)	176 (17.7)	994 (84.2)	
/	*86 (83.6)*	*1 4 (16.4)*	*1180 (100)*	
Actual intake of salt				
Low salt (7 and below	823 (83.2)	167 (16.9)	990 (83.9)	chi2(1) = 0.08, = 0.840
High (above 7)	163 (85.9)	27 (14.1)	190 (16.1)	
/	*86 (83.6)*	*1 4 (16.4)*	*1180 (100)*	
Physical activity				
Sufficient	932 (84.4)	173 (15.7)	1105 (93.6)	chi2(1) = 7.15, = 0.020
Insufficient	55 (72.6)	21 (27.5)	75 (6.4)	
/	*86 (83.6)*	*1 4 (16.4)*	*1180 (100)*	
Diabetic				
No	900 (83.7)	175 (16.3)	1075 (97.1)	chi2(1) = 1.60, = 0.332
Yes	24 (75.3)	8 (24.7)	32 (2.9)	
/	*24 (83.5)*	*183 (16.5)*	*1107 (100)*	
Hypertensive				
No	296 (86.3)	47 (13.7)	342 (29.4)	chi2(1) = 2.24, = 0.233
Yes	680 (82.8)	141 (17.2)	822 (70.6)	
/	*76 (83.8)*	*188 (16.2)*	*1164 (100)*	

for cervical cancer despite high levels of knowledge about cervical cancer and its risk factors [68].

Higher screening rates were seen in older, more educated, richer women and those living in urban areas. This is similar to a study done in Tanzania [69]. Older women are more likely to have interacted with the health system longer and therefore more likely to have undergone cervical cancer screening. A study in France found high screening rates among younger women aged 25–35 year [70]. The explanation for this was the screening services provided during antenatal visits. This calls for integration of cervical cancer services within the Kenya health system to avoid missed opportunities. While this is noted in various national health documents notably the National Cervical Cancer Prevention Program [52], the current practice shows a lack of cervical cancer services across the public health system [53]. Access to health services in rural areas has been cited as a barrier in other African setting [69] and could explain the higher screening rates among urban women. Even though cervical cancer screening is free in the public health sector in Kenya, additional costs such as transport may explain low screening rates among the women in lower wealth quintiles. Programs to increase cervical cancer screening should factor in hidden costs such as transport or lost earnings as women seek screening services especially in asymptomatic phase.

Table 2 Determinants of uptake of cervical cancer screening

Cancer screen	Crude Odds Ratio		Adjusted Odds Ratio	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Age group				
30–34	1.00		1.00	
35–39	0.62 (0.41, 0.94)	0.024	0.54 (0.32, 0.90)	0.018
40–44	1.45 (0.98, 2.14)	0.063	1.50 (0.90, 2.52)	0.121
45–49	0.85 (0.52, 1.39)	0.517	1.00 (0.53, 1.88)	0.988
Marital status				
Not married	1.00			
Married	0.86 (0.48, 1.55)	0.618	1.48 (0.73, 3.02)	0.275
Formerly married	1.04 (0.53, 2.02)	0.912	1.58 (0.70, 3.59)	0.270
Education level				
No formal education	1.00		1.00	

screening uptake, early detection and better treatment outcomes. Advocacy initiatives should focus on younger women aged 35-39 years, and persons with risky as well as non-risky lifestyles.

Abbreviations
HDL: High density lipoprotein; HPV: Human Papilloma virus; LDL: Low density lipoprotein; MOH: Ministry of health; NCD: Non-communicable diseases

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AN coordinated the study. AN, MN, NG, EG conducted the literature review and analysis and wrote the first draft manuscript. JK, PG, CK, RGW reviewed the draft manuscript, provided critical comments. AN, MN NG finalized the manuscript. All authors have read and approved the final manuscript.

Ethics approval and consent to participate
The ethics committee at Kenya Medical Research Institute approved this study (SSC No. 2607).

Consent for publication
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