

Cancer risk factors and access to cancer prevention services for people experiencing homelessness

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Cancer is one of the most pressing global health issues, and populations with complex needs, such as people experiencing homelessness, have higher cancer incidence and mortality rates compared with the housed population. We mapped the evidence on cancer risk factors as well as barriers and facilitators to cancer prevention services among people experiencing homelessness, which is key to localising research gaps and identifying strategies for tailored interventions adapted to people experiencing homelessness. The results of 40 studies contribute to an understanding of the dynamic, interactive factors at different levels that determine access to cancer prevention services: socioeconomic, psychological, and physical factors (individual level); practical support and relational loops between health-care providers and people experiencing homelessness (interpersonal level); housing and regular medical care (system level); and interventions to facilitate access to cancer prevention (policy level). Furthermore, studies reported higher prevalence of various cancer-associated risk factors among people experiencing homelessness with the most common being tobacco use, ranging from 26% to 73%. The results show the importance of interventions to facilitate cancer prevention services through social support and low-threshold interventions (eg, navigation programmes), and training health-care staff in creating supportive and trusting environments that increase the likelihood of the continuity of care among people experiencing homelessness.

Introduction

Cancer is a crucial challenge to public health, responsible for an estimated one in six deaths globally.¹ Major factors influencing survival are timely detection and treatment, which vulnerable groups have especially scarce access to.¹ People experiencing homelessness are particularly affected by cancer, and the incidence and mortality rate is higher than in the housed population.²⁻⁷

Homelessness affects health, with people experiencing homelessness often facing poor health and inadequate access to primary care services. In addition, poor physical health intersects with mental health issues and substance misuse, poor quality of life due to rough living circumstances, and associated psychological implications.^{2,8} People experiencing homelessness are also more commonly exposed to cancer risk factors, including illicit substances, tobacco, and alcohol consumption; risks related to risky sexual practices; and environmental risk factors, such as sun exposure and pollutants.^{4,9,10} Despite their excessive cancer risk, people experiencing homelessness have remained largely invisible in cancer research, bringing about a paucity of evidence on cancer screening rates or their access to early cancer-detection services.^{2,6,11,12} Access to cancer prevention is crucial to counter delayed diagnosis and treatment, which would reduce this population's cancer burden.¹³ Studies addressing access to preventive services for people experiencing homelessness point to a mix of structural and individual factors that influence the uptake of cancer screenings. These factors include the prioritisation of food, shelter, and safety; having little health literacy on prevention; an absence of health insurance; having difficulty accessing health services; and having previous negative experiences with the health-care system.^{2,6,11,12,14}

Practices and behaviours of people experiencing homelessness related to exposure to cancer risk factors

and the use of cancer prevention services are shaped by their complex social environments. This Review takes an ecological perspective on risk factors and screening, considering both the systemic barriers and the more subtle interpersonal factors influencing access to cancer screenings.¹⁵ We present available data regardless of the structural conditions of the specific countries. However, it has to be noted that homelessness is embedded in different policies and structural dynamics across countries, and differences exist in the availability of cancer prevention programmes.¹⁶

Homelessness definitions vary across contexts. The European Typology of Homelessness and housing exclusion guided the selection process of this Review because it accounts for various forms of homelessness (ie, people living roofless, houseless, insecurely, or inadequately).¹⁷ This exhaustive definition shows how differently homelessness is experienced, such as living on the street, in transitional housing, or in overcrowded and unfit dwellings, which might influence access to screening differently.¹⁸

This Review aims to map and explore the nature of the available evidence on exposure to known cancer risk factors of people experiencing homelessness, and barriers and facilitators experienced when accessing prevention services (ie, screening). Examining these domains will advance the current understanding of cancer prevention in a high-need population, highlight the empirical gaps, and provide directions for future interventions.

We conducted a comprehensive literature review^{17,19-21} and extracted data on study characteristics, screening rates, access to cancer prevention services, and cancer risk factors. These descriptive results were presented narratively and mapped (table).⁵⁷ To comprehend data on barriers and facilitators of cancer screenings, textual

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
Agrawal et al (2020) ³² USA	Quantitative; 310 people experiencing homelessness who are smokers; mean age 43 (SD 12) years; 84 (27%) women	Shelter	Lung; screening rate data not provided	Greater smoking-related risk perception was not associated with interest in lung cancer screening	Interest in quitting smoking was associated with interest in screening	Average 12 (SD seven) cigarettes per day; average 19 (SD 12) years smoking over lifetime; 204 (66%) interested in quitting smoking; 232 (75%) interested in screening
Asgary et al (2015) ³⁰ USA	Quantitative; 300 people experiencing homelessness; mean age 45 (SD 12) years; all participants women	Shelters and shelter-based clinics	Cervical; 228 (76%) had one in last 3 years; 54 (18%) screened more than 3 years ago; 18 (6%) never been screened	HPV and HPV vaccine health literacy: 126 (42%) knew of relationship between HPV and abnormal Papanicolaou (known as Pap) test results; 111 (37%) knew HPV is an STD; 75 (25%) had heard about HPV from provider; 60 (20%) had received information on HPV testing or its vaccine; having no compliance with Pap was associated with not knowing the relationship between HPV and an abnormal test result; socioeconomic factors (race, education, duration of homelessness, etc) had no association with knowledge	Study recommends HPV provider counselling coupled with navigators to improve health literacy and to connect patients to HPV and cervical cancer services	111/219 (51%) currently smoke cigarettes; average six (SD four) cigarettes per day; average 22 (SD 13) years smoking over lifetime; 72 (24%) use condoms
Asgary et al (2016) ³¹ USA	Quantitative; 297 people experiencing homelessness; mean age 45 (SD 12) years; all participants women	Shelters and shelter-based clinics	Cervical; 212 (76%) up to date; 246 (88%) screened at least once	144/221 (65%) did not know or did not follow up on results; health literacy: 135/294 (49%) did not know recommendation on frequency; 122/296 (41%) knew about association between HPV and cervical cancer; socioeconomic factors (race, education, duration of homelessness, etc) were not associated with screening being up to date	Provider counselling and health education at all clinical encounters; employ patient and peer educators for health education, appointments, reminders, and help with results; providing informative materials in shelters to improve health literacy	77/297 (26%) condom use; 91/297 (31%) use contraceptives; 111/218 (51%) currently smoke cigarettes; average six (SD four) cigarettes per day; average 22 (SD 13) years smoking over lifetime
Asgary et al (2014) ³³ USA	Quantitative; 56 domiciled; 44 people experiencing homelessness; mean age 59 (SD 6) years; all participants women	Shelter-based clinics	Breast; 26 (59%) up to date; no difference between people experiencing homelessness and domiciled patients	People experiencing homelessness and domiciled patients differed in medical insurance, type of insurance, chronic diseases, HIV and AIDS, and rates of colorectal cancer screening and counselling, but none were independently associated with lower screening	Provider breast cancer counselling was associated with higher rate of up-to-date mammograms irrespective of housing and sociodemographic factors; race, insurance, housing, and history of mental illness or substance misuse were not associated with being up to date	15/44 (34%) currently smoke cigarettes; 4/44 (9%) history of substance misuse; 1/44 (2%) history of alcohol misuse
Asgary et al (2014) ³² USA	Quantitative; 269 people experiencing homelessness; 174 domiciled people with low income; mean age 60 (SD 8) years; 106 (24%) women	Shelter-based clinics	Up-to-date colorectal screening rate among people experiencing homelessness significantly lower (53/269 [20%]) than the rate of domiciled people (72/174 [41%])	Homelessness was a risk factor for not having an up-to-date colorectal cancer screening; identified barriers were that bathrooms are not private in shelters, which makes preparing for colonoscopy difficult (colon must be cleansed); health providers were less likely to counsel participants with history of mental illness	Provider counselling was associated with up-to-date screening; chronic disease was associated with increased chance of screening; participants who were older, had housing, and have received counselling were more likely to have screening	NA

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
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USA	Asgary et al (2017) ²⁴ Quantitative; navigation programme; 162 people experiencing homelessness who were not up to date with screening; mean age 45 (SD 13) years; all participants women	Shelter clinics and hospitals	Breast: 46/52 (88%) screened; cervical: 119/143 (83%) screened during navigation period; baseline screening rates were low	Participants refused screening due to discomfort with test and environment, having no belief in screening, and preferring breast self-examination; no significant relationship between race, history of substance misuse, smoking, number of years of homelessness, number of pregnancies, and rates of mammogram or Pap test; older women more likely to refuse; not having time or expenses, having mental health issues, and substance misuse were not found to be reasons for refusal	Female navigators created rapport with people who experienced abuse; regular communication; monthly staff meetings with medical and non-medical staff; support staff introducing the navigation model and addressing issues; enhanced collaboration; and support provided	92 (57%) history of substance misuse; 117 (72%) history of sexually transmitted infections
USA	Asgary et al (2015) ²⁵ Qualitative; 50 people experiencing homelessness; mean age 52 (SD 11) years; 29 (58%) women	Shelter-based clinics	Cancer (all sites); screening rate data not provided	Barriers identified were: no screening counselling, information, or guidance on the importance of screening; no support and navigation on how to get to screening sites and appointments, or having issues with transport, with no help from caseworkers; issues with insurance, resources, and support; not being sexually active (female-specific); negative experiences with health-care system, such as discrimination; learned fatalistic view towards system in terms of help (eg, screening is difficult to obtain and not a priority); fear of screening and results; embarrassment	Facilitators identified: education on screening process; reminders and help with navigation, mobile free clinics for testing, and having a more holistic approach to health care; participants suggested incentives to improve uptake (eg, small gifts, personal hygiene, transportation); a substantial number of participants welcomed screening; screening was considered a top priority among those aged >50 years	NA
USA	Bharel et al (2009) ²⁶ Quantitative; 205 people experiencing homelessness offered a Pap test; mean age 45 (10) years; all participants women	Facility for people experiencing homelessness	Cervical (129 [63%] in need, of these participants 80 [62%] accepted screening); 55% of US population screened within past 12 months vs 36% people experiencing homelessness	49/129 (38%) declined the screening offered, despite some having been approached several times; reasons for declining included participants planning on having screening done elsewhere and participants believing they were not at risk or they were unhygienic; no significant differences in demographic factors between who accepted and declined, except for age (those who declined were an average of 3.5 years older than those who took part)	NA	149 (73%) current smokers; 85 (41%) history of sexually transmitted infections; 26 (13%) HIV positive; 25 (12%) family history of cervical cancer; 4 (2%) exposed to diethylstilbestrol in utero
USA	Bharel et al (2015) ²⁷ Quantitative; patient-centred approach; 2552 women experiencing homelessness in 2008 and 2882 women experiencing homelessness in 2013	Boston Health Care for Homeless Program	Cervical; significant increase in screening after intervention; 2008: 485 (19%) screened in past 3 years; 2013: 1441 (50%) after intervention	Biggest challenge was prioritising a patient's schedules while addressing preventive care; competing priorities (eg, access to food, shelter, and safety) deemed more important than addressing preventive care	Support from support workers and case managers; open-access clinics; information on open-access clinic hours; building a safe environment (ie, providing trauma-informed care); engaging in patient's history; explaining examinations; addressing health needs; culturally sensitive education; education provided on screening; multidisciplinary approaches were associated with increased screening	NA

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
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Bánóczy et al (2001) ²⁸	Quantitative; 17 325 participants; 300 people experiencing homelessness; aged 20–81 years; 70 (23%) women; 230 (77%) men	..	Oral; screening rate data for people experiencing homelessness not provided	NA	NA	All participants smoked or misused alcohol (152 [66%] men and 32 [45%] women did both); 58 (19%) had oral lesions (eg, tumour, carcinoma, precancer)
Chau et al (2002) ²⁹	Quantitative; 221 people experiencing homelessness; mean age 47 (range 21–78) years; 101 (46%) women; 120 (54%) men	Shelters	Colorectal (FOBT; aged ≥50 years): 39/92 (42%) had been screened at any time; 17/92 (18%) had been screened in the past year; endoscopy (aged ≥50 years): 11/48 (23%) had been screened at any time; 4/44 (9%; women only) had been screened in the past year; prostate (men aged ≥50 years): 9/48 (19%) had been screened at any time; 5/48 (10%) had been screened in the past year; breast (women): 51/76 (67%) had been screened at any time; 24/74 (32%) had been screened in the past year; cervical (women): 97/100 (97%) had been screened at any time; 55/100 (55%) had been screened in the past year; skin: 53 (24%) had been screened at any time; 33 (15%) had been screened in the past year	Low screening uptake was associated with money and access issues and discomfort (especially regarding colorectal cancer screening); some reported not thinking they needed screening because they were not feeling unwell; only a few family members and friends were screened, or the study participants had no friends who encouraged them to screen for cancer	NA	157 (71%) current smokers; 102 (46%) alcohol misuse; 100 (45%) report drinking 750 mL of alcohol in a day; 89 (40%) report drinking every day in a 2-week period; 159 (72%) never use sunscreen; 82 (37%) never wear a hat; 205 (93%) sit in the shade; 10 (5%) never exercise; 70 (32%) with overweight; 50 (23%) with obesity; 6 (3%) with extreme obesity
Diamant et al (2002) ³⁰	Quantitative; 2782 low-income people without health insurance; 324 people experiencing homelessness; all participants women	NA	Cervical: 185 (44%) screened in the past year; breast: 3/30 (10%) screened within the past year	People experiencing homelessness who drank alcohol on a regular basis or had a chronic medical condition were less likely to have a Pap test	Significantly more likely to have had mammogram if housed, were a non-smoker, did not drink alcohol, and had a good health status; study found significant racial differences for receipt of cervical cancer screening (African American women had higher Pap smear rates than White women)	NA
Folsom et al (2002) ³¹	Quantitative; 94 people experiencing homelessness with mental health issues; mean age 52 years for people with schizophrenia; mean age 51 years for people with depression; 44 (47%) women	Shelter with free clinic	Breast: 9/22 (41%) had screening within the past year in people with schizophrenia; 8/22 (36%) had screening within the past year in people with depression; colorectal: 2/47 (4%) had FOBT within the past year in people with schizophrenia; 13/47 (28%) had FOBT within the past year in people with depression	NA	NA	In people with schizophrenia 14/47 (30%) misused alcohol and 17/47 (36%) misused drugs; in people with depression 13/47 (28%) misused alcohol and 7/47 (15%) misused drugs

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
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Europe	Quantitative; 298 people who use drugs; 83 people experiencing homelessness; median age 43 years (IQR 36–55); all participants women	Substitution treatment clinics and needle exchange programme	116/285 (41%) complied with recommended cervical cancer screening recommendation (ie, every 3rd year for women aged 23–49 years, every 7th year for women aged 50–64 years); 52/182 (29%) complied with recommended breast cancer screening (ie, every 18–24th month for women aged 40–74 years)	Unstable housing was associated with non-compliance in cervical cancer screening and in breast cancer screening	NA	NA
USA	Quantitative model programme; 460 people who are low income and domiciled; 210 people experiencing homelessness; average aged 33 years; 80 (38%) women	Community ambulatory health centre	Cervical: less than a third have had screening; 20 (25%) women experiencing homelessness had received Pap test vs 6 (5%) women who are low income and domiciled	Low rates of testing because of clinicians' needs to attend to immediate medical issues; lack of patient cooperation	People experiencing homelessness treated in special model programme returned on numerous occasions for follow-up (more often than domiciled); provided care to people experiencing homelessness that was accessible, non-judgemental, and sensitive to their needs; accessibility was increased by a walk-in appointment system; incentives included showers, homeless advocacy, and travel vouchers	NA
USA	Quantitative; patient-level intervention; aged 50–74 years	Homeless clinics	Colorectal; number of FIT kits distributed increased; number of FIT kits returned increased; 91 patients screened on the basis of 353 FIT kits	Some FIT kits were not returned on time; some patients forgot they had received FIT kits; despite staff providing education about screening, patients might have competing priorities; follow-up rate for colonoscopies after positive FIT tests did not increase substantially between usual care and implementation; difficulty obtaining transport and privacy for bowel preparation	Financial incentives, such as prepaid US\$10 gift cards for a supermarket, together with patient navigation and reminders were positively associated with return	NA
USA	Quantitative; 75 people experiencing homelessness; 34 (45%) aged 18–44 years; 41 (55%) aged ≥45 years; all participants men	Shelter	Skin; 10 (13%) have been screened before; 53 (71%) have never checked themselves	NA	NA	38 (51%) did not know that tan was a sign of skin damage; 71 (95%) knew that those with darker skin could get skin cancer; 42 (56%) identify sunburns and family history as risk factors; 37 (49%) identify a change in mole's appearance and becoming sore and not healing as signs of skin cancer; 39 (52%) are in the sun often; 16 (21%) use sunscreen; 48 (64%) stay in the shade; 40 (53%) limit time in the sun
USA	Quantitative; 6334 people with housing; 213 people experiencing homelessness; all participants women	NA	Breast; screening rate data for people experiencing homelessness not provided	People experiencing homelessness had lower odds of long-term mammography; people experiencing homelessness in the youngest age strata (aged 43–49 years) had lower odds of long-term mammography	NA	NA

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
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USA	Kohler et al (2021) ³⁶ Qualitative; 18 patients; 11 providers; 9 (50%) aged >50 years; 6 (33%) aged 41–50 years; 2 (11%) aged <40 years; 1 (6%) age not known; all participants women	Hospital-based clinics, shelters, outreach sites, and medical respite units	Cervical: 9 (50%) under screened (ie, due to refusing, being overdue, or never having been screened)	Identified barriers were sexual assault, violation, or trauma; providers believed prevalence of undisclosed sexual trauma was high because of strong reactions to Pap tests; those with trauma used stronger language (eg, “scared to death”); Pap tests can be a trigger and can retraumatise; some patients avoided anything related to pelvic examination; others thought trauma influenced screening experience and future intentions; flashbacks because of body positioning during examinations; physical and psychological reactions to screening for patients both with and without trauma; instruments hurt (large, cold speculum caused pain); feeling uncomfortable because of positioning	Identified facilitators were providing compassionate care and good patient-provider relationships; few saw screening as a priority; many accepted screening to stay healthy; benefits of screening outweighed trauma-related discomfort; patients appreciated seeing tools and hearing what happens during examination; providers offered female provider option	NA
USA	Kosog et al (2020) ³⁸ Quantitative; 1161 people with housing; 743 people experiencing homelessness; aged 50–74 years; all participants women	Community-based Health Centers; 499 transitional housing; 244 shelters	Breast: screening rate data for people experiencing homelessness not provided	Significant association with homelessness and adherence; self-paid insurance associated with lower adherence; significantly fewer people experiencing homelessness (eg, staying in shelters) were compliant than people living in transitional housing	People aged 55–59 years or 65–69 years and people who had a doubled-up (ie, shared living arrangement) or transitional homelessness status were more likely to have increased adherence; people living in a doubled-up situation or receiving support from a housing project were more inclined to seek services; the more support received, the greater the likelihood that they would take care of health needs	NA
USA	Long et al (1998) ³⁷ Mixed methods; 105 people experiencing homelessness; mean age 41 years; all participants women	Shelters	Cervical: 57 (54%) screened in past year; 7 (7%) never screened; breast: 28/59 (47%) screened in past year (aged >40 years); 16% of women aged >50 years have never been screened	NA	Clinical breast examination: being up to date was significantly associated with being of Black race, having ≥12 years' education, health care in one place with one provider, having had more medical visits in the past year, and having spoken with provider about cancer prevention; mammogram: being up to date was associated with having ≥12 years' education, being a non-smoker, and having spoken with provider about cancer prevention; pap smear: being up to date was associated with conducting self-examination of breasts, having more medical visits in the past year, and having more education	NA
USA	May et al (2014) ³⁸ Quantitative; 357 veterans; 82 people experiencing homelessness	Veterans Affairs	Colorectal: screening rate data for people experiencing homelessness not provided	Being African American (vs other races); homelessness; lower service connectedness; taking more prescription drugs; and not seeing a primary care provider within 2 years of screening eligibility	NA	NA

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
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Mayo et al (2022) ³⁹	USA Quantitative; 3413 people with housing; 1605 people experiencing homelessness; median aged 58 years; all participants men	Hospital	Prostate: 1146 (34%) people who have housing had received a prostate-specific antigen test vs 201 (13%) people experiencing homelessness	NA	Primary care provider (OR 2.54), Medicare (1.61), private insurance (2.24), and being employed (2.22) significantly increased the odds of receiving prostate-specific antigen testing	NA
McGuire and Rosenheck (2005) ⁴⁰	USA Quantitative; 94 932 people with housing or experiencing homelessness	Veterans Affairs	Colorectal: 30/48 (63%) people experiencing homelessness for <180 days screened; 256/407 (63%) people experiencing homelessness for ≥180 days; breast: 9/11 (82%) people experiencing homelessness for <180 days screened; 53/65 (82%) people experiencing homelessness for ≥180 days screened; cervical: 26/27 (96%) people experiencing homelessness for <180 days screened; 153/167 (92%) people experiencing homelessness for ≥180 days screened; prostate: 47/96 (49%) people experiencing homelessness for <180 days screened; 362/651 (56%) people experiencing homelessness for ≥180 days screened	Prostate screening rates were lowest for veterans experiencing homelessness for shorter amount of time and were lower for veterans experiencing homelessness for longer amount of time than for domiciled veterans; colorectal and breast screening: both groups of people experiencing homelessness had equally lower preventive service use than the domiciled group	NA	NA
Mings and Soto Mas (2019) ⁴¹	USA Quantitative; 60 people experiencing homelessness; 5 (8%) aged 18–25 years; 15 (25%) aged 25–40 years; 33 (55%) aged 40–60 years; 7 (12%) aged >60 years; all participants women	Health-care facility for people experiencing homelessness	Cervical: 23/54 (43%) had screening within past 3 years and intended to get another one when needed; 7/54 (13%) had screening 3 years ago and intended to get one within next month; 2/54 (4%) had never been screened before, but intended to get one within next month; 3/54 (6%) had no intention to be screened	33 (55%) did not have enough time; 19 (32%) had difficulty obtaining appointment; 14 (23%) felt embarrassment; people with negative attitudes towards test outcomes were less likely to have had Pap test; people with more knowledge were less negative about Pap tests; 12 (20%) had painful experience in past; 5 (8%) had fatalistic thoughts about cervical cancer	Women who had a good experience with the Pap smear examination had more positive attitudes about the process of testing; participants with increased knowledge on Pap smears and cervical cancer were less likely to avoid screening due to fear of cancer diagnosis than those with less knowledge; provider explaining efficacy of Pap smear is important	NA

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
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Moore and Durden (2010) ⁴²	USA Qualitative; 325 people experiencing homelessness; mean age 36 (SD 2) years; 80 (25%) women	Mobile clinic that visits homeless shelters	NA	NA	NA	136/255 (53%) smoke cigarettes; 28/255 (11%) smoke cigars; 9/255 (4%) chew tobacco; 2/255 (1%) use so-called snuff; 182/255 (71%) know that tobacco use can cause lung cancer; 51/251 (20%) know that tobacco use can cause head and neck cancer; 68/251 (27%) currently drink alcohol; cigarette smoking and drinking alcohol increased need for medical follow-up; daily consumption of pure alcohol was associated with a higher chance of cancer; non-drinkers who smoked ≥25 cigarettes per day had seven times increased risk of oropharyngeal cancer compared with non-smokers
Moravac (2018) ⁴³	Canada Qualitative; 26 people experiencing homelessness with mental health challenges; age 24–74 years; all participants women	Homeless shelter system or assisted living residences	Cervical: 19 (73%) of 26 were up to date; 6 (23%) of 26 were under screened; 1 (4%) had never been screened; breast: 4 (31%) were up to date; 4 (31%) were under screened; 5 (38%) had never been screened	For some participants, high levels of anxiety impeded testing, but for others mental health did not interfere; past and current drug misuse interfered with use of health care; safe and stable housing is crucial for health; past sexual abuse made Pap tests painful and could retraumatise; options for a female provider were important; a quarter did not have a primary care provider; poor communication; feeling stigmatised and rejected; being socially isolated caused an absence of support from family or friends	Participants recommended that health-care providers have empathy, be more respectful, have more time, engage with sensitivity, provide supportive accompaniment, have informative materials in plain language and multiple languages; ask about sexual history, explain what will happen during the procedure, enquire whether the patient wants the speculum warmed up, help the patient relax, and ask the patient how it went; recommendations at the system and policy level include ongoing funding and sensitivity training tools for providers	NA

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
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Moya et al (2023) ⁴⁴	USA Mixed methods; 74 people experiencing homelessness; aged 18–75 years	Shelters, transitional living centres, overflow shelters, living centres for older people, centres for veterans	Cancer: 30 (41%) screened; 42 (57%) not screened	NA	NA	31 (42%) had a family history of cancer; 38 (51%) had a history of tobacco use; 37 (50%) had a history of drinking alcohol; 61 (82%) perceived themselves as low cancer risk in regard to unprotected sex; 59 (80%) perceived themselves as low cancer risk in regard to having multiple sexual partners and in regard to drug use; 58 (78%) perceived themselves as low cancer risk in regard to workplace risk; 54 (73%) perceived themselves as low cancer risk in regard to obesity; 49 (66%) perceived themselves as low cancer risk in regard to family cancer history; 20 (27%) perceived themselves as moderate cancer risk in regard to unhealthy eating; 19 (26%) perceived themselves as moderate cancer risk in regard to sun exposure; 16 (22%) perceived themselves as moderate cancer risk in regard to exposure to pesticides; 19 (26%) perceived themselves as high cancer risk in regard to tobacco use
Pinsker (2016) ⁴⁵	USA Quantitative; 110 people experiencing homelessness; mean age 42 (SD 11) years; all participants women	NA	Of women experiencing homelessness who are smokers, breast: 38 (56%) of 68 up to date with screening (aged ≥40 years); cervical: 75 (68%) of 110 up to date with screening (aged ≥18 years)	Factors that were associated with a lower probability of receiving a mammogram in the past year were being addicted to smoking (RR 0.63), having overweight or obesity (0.71), and having anxiety (0.63); the probability of having had a Pap test in the past year (aged >18 years) was lower for those addicted to smoking (RR 0.75), those with a greater autonomous motivation to quit (0.77), and those who smoked the same number of cigarettes as 1 year previous (0.58)	Factors associated with a higher probability of having had a mammogram in the past year were being Black, having a greater motivation to quit, smoking less than 1 year ago or smoking the same amount, and having a case manager to help coordinate care; factors associated with having a higher probability of having had a Pap test in the past year were being Black, smoking the same number of days per week as in the past year; of those aged 40 years or older, being up to date for breast cancer screening was associated with being up to date for cervical cancer screening; 33/68 (49%) participants aged ≥40 years were up to date for breast and cervical cancer screening; Black women were more likely to be up to date than White women	NA

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Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
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Poncet et al (2021) ⁴⁶	Europe Quantitative; 469 migrant women experiencing homelessness; 153 (33%) aged <30 years; 215 (46%) aged 30–40 years; 72 (15%) aged 40–50 years; 28 (6%) aged ≥50 years	Emergency housing	Cervical: 216 (46%) had no lifetime screening	Having no lifetime cervical cancer screening was significantly associated with sociodemographic factors: 37/54 (69%) women with no schooling had no lifetime cervical cancer screening vs 22/74 (30%) women with higher education; 44/73 (60%) respondents with very poor language skills had no lifetime cervical cancer screening vs 57/158 (36%) respondents with good language skills; 116/222 (52%) in a relationship more often had no lifetime cervical cancer screening vs 60/165 (36%) not in a relationship; those with a longer length of residence in France were associated with significantly lower rates of having had no lifetime cervical screening; those with no health coverage more often had no lifetime cervical screening (41/76 [54%]) than those with health coverage (56/147 [38%]); 107/259 (41%) had visited a general practitioner in past year; 58/168 (35%) had visited a gynaecologist in past year; 104/252 (41%) had given birth in France; 72/135 (53%) had not given birth in France	Single women were less likely not to have been screened than separated women (OR 0.46); women with a duration of residence ≥3 years were less likely to have never been screened; those who had visited a gynaecologist in the past year were less likely not to have been screened (adjusted OR 0.49)	All participants smokers
Ramirez (2007) ⁴⁷	USA Quantitative; 41 people experiencing homelessness; aged 20–70 years; all participants women	Shelters	Breast; screening rate data not provided	Participants believed they were unlikely to get breast cancer; 23 (56%) had no money for a test; 39 (95%) said they would take a free mammogram	Positive perceptions regarding benefits of screenings and minimal concern about negative aspects of having a mammogram	NA
Rogers et al (2017) ⁴⁸	USA Quantitative; 124 people experiencing homelessness; aged ≥50 years; 102 (82%) men	Shelters and transitional housing	Colorectal; 60 (48%) had been screened	Depression was the only psychosocial variable negatively associated with colorectal cancer screening; participants with depression were less likely to complete screening than those without; health insurance was not associated with colorectal cancer screening among White participants; Black participants with Medicaid, Medicare, or other health insurance were less likely to have obtained colorectal cancer screening than participants without health insurance	Participants currently unable to work were 6.2 times more likely to ever receive colorectal cancer screening than those who were employed	NA
Rosengard et al (2001) ⁴⁹	USA Quantitative; 105 people experiencing homelessness; aged 41 (SD 11) years; all participants women	Shelters	Breast: 54 (51%) had had a breast examination in the past year; cervical: 57 (54%) had had a cervical examination in the past year	NA	Proportion of participants who were up to date on examinations was slightly higher among those with health insurance	28 (27%) misused alcohol; 27 (26%) used cocaine; 7 (7%) used heroin; 5 (5%) used cannabis; 6 (6%) used >1 substance; participants aged 18–25 years were less likely to eat at least two meals per day
Teal et al (2020) ⁵⁰	USA Pilot project; 15 people experiencing homelessness; median age 49 (39–56) years; 5 (33%) women	Student-run free clinic	Skin; multiple patients had never been to dermatologist but were eager to be seen by one	Helpful to have access to the free clinic because the community clinic was booked months in advance and required several buses; many had minimal understanding of skin findings; many were concerned about cancer	Routine dermatological care in the student-run clinic meant that people experiencing homelessness could return; continuity was shown to lead to better outcomes	NA

(Table continues on next page)

Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
(Continued from previous page)						
Vuillermoz et al (2017) ⁵¹	Quantitative; 508 people experiencing homelessness; 137 (27%) aged 25–29 years; 152 (30%) aged 30–34 years; 193 (38%) aged 35–44 years; 25 (5%) aged ≥45 years; all participants women	Sheltered families	Cervical; 290 (57% [95% CI 52–61]) had no lifetime cervical cancer screening, with significant difference between those who have regular gynaecological follow-up (41/125 [33%]) and those who do not (245/383 [64%]); in 2010, only 8% of women in the French general population had never been screened	Having lived a quarter of life or less in France, having a history of births in France, having experienced homelessness ≥2 years, and having a history of excessive alcohol consumption influenced having no lifetime screening for those who did not have regular gynaecological follow-up; being aged ≥45 years, not being a French citizen, and having a history of excessive alcohol consumption influenced having no lifetime screening for those who did have regular gynaecological follow-up	NA	NA
Weinreb et al (2002) ⁵²	Quantitative; 220 low-income housed mothers and 220 sheltered mothers experiencing homelessness in the case group; 216 low-income housed mothers in the control group; 187 (43%) aged <25 years; 111 (25%) aged 25–29 years; 138 (32%) >29 years; all participants women	NA	Cervical; 167 (76%) of mothers experiencing homelessness screened in the past year	NA	Factors associated with having had a recent Pap smear were having given birth in past year, having a history of vaginal infection, having a history of abnormal Pap results, having a regular source of care, and having been hospitalised within the past year; having a regular source of care was strongly associated with receiving preventive services	NA
Williams et al (2018) ⁵³	Quantitative; 201 people experiencing homelessness; mean age 52 (SD 14) years; 63 (31%) women	NA	Breast (aged ≥45 years): 31/43 (72%) screened at any point; 20/43 (47%) had one screening within the past year; 5/43 (12%) had one screening within the past 1–5 years; cervical: 51/55 (93%) screened at any point; 40/47 (85%) screened within the past 3 years; colorectal (aged ≥50 years): 44/100 (44%) had had sigmoidoscopy or colonoscopy in their lifetime; prostate: 27/79 (34%) screened at least once at any point; 13/79 (16%) screened within the past year; 8/79 (10%) screened <1 year ago	NA	Older age and obesity status were significantly positively associated with colonoscopy screening; older age was significantly associated with prostate-specific antigen test among men and with mammogram screening among women	45/194 (26%) used tobacco; average of nine (SD eight) cigarettes per day; average of 22 (SD 13) years smoking; 147/188 (80%) had second-hand smoke exposure at least some of the time; 100/188 (53%) had second-hand smoke exposure daily; average BMI 28 kg/m ² (SD 7, range 15.2–53.4 kg/m ²); 149/198 (75%) had at least moderate intensity exercise for a minimum of 30 min on ≥2 days during the past week; 42/201 (21%) always used sunscreen; 14/201 (7%) often used sunscreen; 17/201 (8%) sometimes used sunscreen; average of 2.5 (SD 1.7) servings of fruits and vegetables per day; 130/201 (65%) had at least one alcoholic beverage 0–1 days per week; 42/210 (21%) had at least one alcoholic beverage 2–7 days per week

(Table continues on next page)

Region	Study methodology and participant details	Recruitment sites	Cancer site and screening rates	Barriers	Facilitators	Cancer risk factor prevalence
(Continued from previous page)						
Wittenberg et al (2015) ⁵⁴	USA Qualitative; 42 people experiencing homelessness; mean age 39 (range 20–64) years; all participants women	NA	Cervical: 41 (98%) had screening during lifetime	NA	Screening decision was positively influenced when a provider was caring, respectful, trustworthy, and non-judgmental; there was familiarity with the provider; the setting accepts people experiencing homelessness; there is no suspicion of drug use; scheduling appointments is easy; an explanation of test during examination was given; and an explanation of the results and support with positive results was provided; gender of person doing examination was relevant, but no gender was dominant in preference (ie, allow patients to choose); participants expressed concerns about their hygiene; a fear of examination because of past sexual trauma was reported	NA
Wittenberg et al (2016) ⁵⁵	USA Quantitative; 165 people experiencing homelessness; mean age 43 (SD 13) years; all participants women	Medical respite centre and out-patient clinic for people experiencing homelessness; residential substance use treatment programme; transitional housing programme	Cervical: 149 (90%) screened in the past 3 years	NA	Support was the biggest influence for participants to pursue testing, followed by no-cost testing; hygiene accommodations and provider being familiar had the least influence; personal hygiene accommodations were substantially less important for women who reported addiction	NA
Wu et al (2020) ⁵⁶	Canada Quantitative; 100 people experiencing homelessness; median age 46 (IQR 37–58) years; 36 (36%) women	Shelters	NA	NA	NA	67 (67%) active smokers; 32 (32%) misused alcohol; 32 (32%) other substance misuse; average of 26 (SD 22) years smoking; three (3%) had suspicious head and neck masses; poor awareness of head and neck cancer and warning signs

FIT=faecal immunochemical test; FOBT=faecal occult blood test; HPV=human papillomavirus; NA=not applicable; OR=odds ratio; RR=risk ratio; STD=sexually transmitted disease.

Table: Data extraction and study characteristics

data were condensed and reviewed to identify key categories (eg, practical support and socioeconomic factors) in an iterative process. We later used and adapted the ecological model¹⁵ to group these categories at different levels.

The database search yielded 8007 studies, of which 4214 remained after removing duplicates. Title and abstract screening left 142 articles to be assessed for eligibility in full-text reading. An additional search in Google and OpenGrey resulted in 63 studies that were checked for duplicates, leaving 38 documents for full-text screening. In total, 36 peer-reviewed articles from databases and four from the grey literature searches were included in this Review (appendix p 10).

Cancer risk factors

15 studies assessed behavioural cancer risk factors, such as tobacco use, alcohol consumption, substance misuse, sun exposure, condom use, nutritional factors, and obesity.^{9–11,22–24,26,28,29,31,42,44,49,53,56} Two of these articles assessed multiple factors (ie, tobacco and alcohol consumption, BMI, physical activity, nutritional factors, and sunscreen use).^{29,53} None of the reviewed articles explored exposure to toxic chemicals or radiation.

Tobacco use and alcohol consumption were the two most assessed cancer risk behaviours in the included studies. The number of people experiencing homelessness who currently smoke was high compared with population-survey data (appendix pp 12–15), ranging from 26% to 73% of the studied populations of people experiencing homelessness.^{10,26,29,42,44,53,56} Alcohol abuse ranged from 3% to 50% among people experiencing homelessness in four studies.^{29,31,49,56} One study reported that among people experiencing homelessness, 152 (66%) of 230 men and 32 (46%) of 70 women smoked and abused alcohol.²⁸ Two studies found that high tobacco and alcohol use combined with low awareness of adverse effects are risk factors for head and neck cancers.^{42,56} One study reported a prevalence of tobacco use (ie, cigarette or cigar smoking, tobacco chewing, or using snuff) of 70% (179 of 255) among people experiencing homelessness and the risk of oropharyngeal cancer was seven times higher in those who were smokers compared with non-smokers. Among those with cancer symptoms (eg, skin changes), the majority (184 [72%] of 256) had not received adequate health care.⁴²

One study found a low perception of cancer risk with unprotected sex and multiple sexual partners,⁴⁴ and in two other studies condom use among people experiencing homelessness was 24% and 26%.^{10,11} In two studies, most people reported being physically active for 20 min a day; however, 32–33% of respondents were overweight, and 23–25% were obese or extremely obese.^{29,53}

Three studies reported sunscreen use; 21% and 44% of people experiencing homelessness used sunscreen,^{9,53} and 72% had never applied it.²⁹ An increased risk of skin cancer was coupled with low screening estimates in two

studies: 10 (13%) of 75 participants have ever been checked for skin cancer by a health-care provider in one study⁹ and in another 53 (24%) of 221 had ever had a skin examination.²⁹

Access to cancer prevention services

Cancer screening rates

In 12 studies, cervical cancer screening rates among people experiencing homelessness were between 54% and 98%.^{10,11,29,37,40,43,45,49,52–55} In six studies, cervical cancer screening rates ranged from 19% to 44%.^{27,30,32,33,36,41} Two studies found 46–57% of the study population had never been screened for cervical cancer, with an absence of routine gynaecological care being a determining factor.^{46,51}

See Online for appendix

Four studies found rates of up-to-date mammograms below the national average,^{18,23,24,32} and six reported screening rates below 50% in the previous year.^{29–31,37,43,53} In three studies, up-to-date breast cancer screening among people experiencing homelessness ranged from 51% to 82%.^{40,45,49} In another four studies, colorectal cancer screening rates were below 50%.^{12,29,48,53} In one study, 13 (16%) of 79 people experiencing homelessness over the age of 50 years had a prostate-specific antigen test in the previous year,⁵³ and in another study people experiencing homelessness had a much lower testing rate (201 [13%] of 1605) than study participants who did not experience homelessness (1146 [34%] of 3413).³⁹

Barriers and facilitators to cancer screening

According to the included studies, facilitators and barriers primarily concern the individual, interpersonal, system, and policy levels (figure).

Socioeconomic factors

Two studies of people experiencing homelessness in France assessed factors related to having had no cervical cancer screening within their lifetime.^{46,51} Factors associated with never having been screened for cervical cancer were having a low level of education (ie, no schooling), being in a relationship, having a short duration of residence in France (ie, <3 years), and having no regular visits to a gynaecologist,⁴⁶ as well as living in France for a quarter of their life or less, having given birth in another country, being homeless for over 2 years, and alcohol abuse.⁵¹

According to two US studies, having little health literacy was a barrier to effective cervical cancer screening.^{10,11} The studies reported an unfamiliarity with the frequency recommendations of a Papanicolaou test (also known as a Pap test), not understanding the association between human papillomavirus (HPV) and cervical cancer, and limited awareness of the need for follow-up test results.^{10,11} In these two studies, socioeconomic factors (eg, age, race, and sexual orientation) were not associated with knowledge regarding HPV or with being up to date on cervical cancer screening.^{10,11}

Further, included studies examined age,^{24,26,53} health insurance,^{12,18,48,49} or race^{30,38,45,48} but derived different

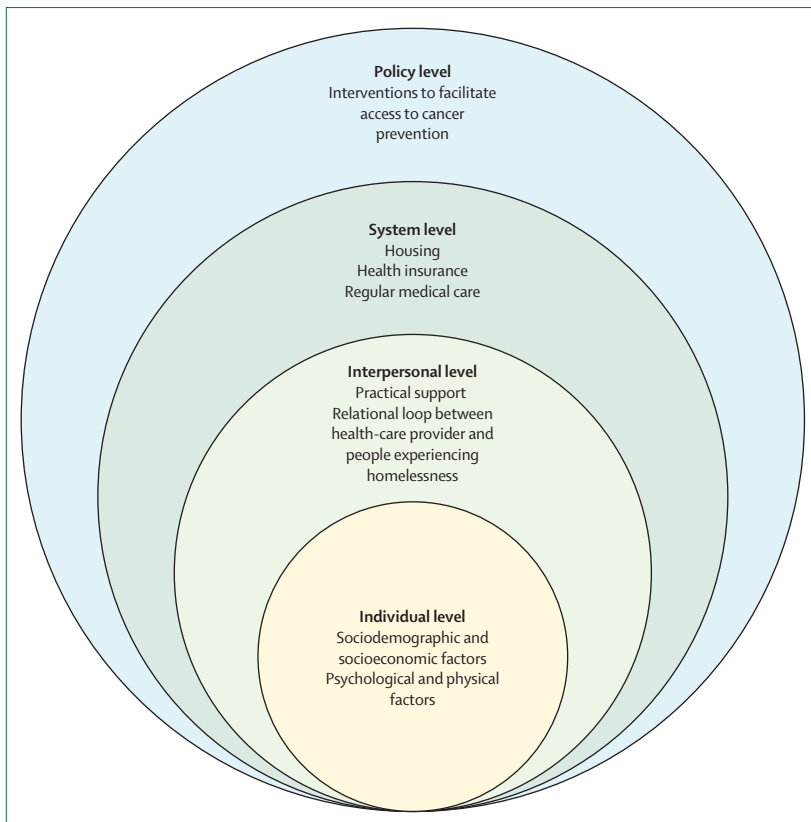


Figure: Factors determining access to cancer preventive services

conclusions, which might be attributable to the heterogeneity of the studies (eg, study design, context of homelessness, methods, cancer screening types, and variables used).

Psychological and physical factors

Being uncomfortable with the Pap test and the testing environment, fear of the examination and its results, and embarrassment were perceived as relevant barriers.^{24,25,36,41} Having been diagnosed with a mental illness was a psychosocial variable that was negatively associated with colorectal cancer screening in two studies,^{31,48} but was not associated in another study.¹²

Having had previous sexual trauma influenced the overall screening experience and future intentions to be screened, including the decision not to participate in screening again.^{36,43} The Pap test was sometimes perceived as a trigger for retraumatisation. Those who had previous trauma felt pain, described cervical cancer screening as “terrifying”, or were “scared to death of being touched”.³⁶

Practical support

Support is crucial for participating in various cancer screenings. People experiencing homelessness are often socially isolated, have no companionship during screening, or do not get support navigating the

health-care system.^{25,29,43,55} A study in eastern Kentucky, USA, found that financial incentives, paired with patient navigation and patient reminders increased return rates of faecal immunochemical tests.³⁴ Patient navigators followed up when a test was not returned, helped to address barriers such as transportation to clinics, and facilitated the use of tests or replacement of tests that had been lost.³⁴ Similarly, other studies found that help in navigating or coordinating care, reminders, and receiving support positively affected screening uptake.^{10,18,24,34,55}

Relational loop between health-care providers and individuals

Negative experiences with the health system (eg, discrimination, feeling stigmatised, or poor communication) led to the perception of accessing health care as complex and ultimately unimportant.^{25,43} Factors influencing regular screening uptake were the provision of a safe environment, social competencies, and characteristics of the health-care provider, such as being trustworthy, empathic, and non-judgemental.⁵⁴ Key to building a safe environment was engaging in conversations about the patient’s history (eg, sexual trauma) and explaining the screening procedure thoroughly. These conversations included specifying what would happen during the test, providing reassurance, and following up on how the person had felt about the screening.^{27,36,43,54} Another relevant factor was providing explanations of results and support in the case of positive results.⁵⁴ Building up and maintaining a trusting relationship was crucial in such encounters. For example, some women who had sexual trauma were willing to accept the Pap test when they had a preserving, trusting relationship with the provider and received compassionate care.³⁶ In this context, the possibility of choosing the gender of the provider was important as well.^{36,43,54}

Housing

Factors related to infrastructure of shelters were found to have a role. For example, the availability and accessibility of toilets is pivotal for colorectal cancer screenings, and not having enough privacy in shelter toilets makes effectively preparing for a colonoscopy or performing a faecal occult blood test difficult.^{12,34,53}

Another study found that people experiencing homelessness aged 55–59 or 65–69 years living in shared arrangements or transitional housing were more likely to adhere to breast cancer screening recommendations than those facing other forms of homelessness.¹⁸ This greater compliance is possibly due to receiving more support and influence from their social environment in these forms of housing.¹⁸

Eight studies comparing people experiencing homelessness and people who are housed but with restricted options, such as domiciled people with very low incomes, found that people experiencing

homelessness were less likely to have had cancer screenings.^{12,18,30,32,35,38–40} In a study in which people experiencing homelessness and domiciled patients accessed the same health-care facilities, people experiencing homelessness were less likely to have had a colorectal cancer screening.¹² Although the populations differed according to factors such as alcohol abuse and mental illness, these factors were not independently associated with lower uptake but were possibly associated with homelessness.¹²

Regular medical care

Although having regular access to health care is an important factor for obtaining preventive services, known barriers for people experiencing homelessness, such as not having access to adequate health care or feeling discriminated against, might make it more difficult than for people with housing. In a study among mothers with low income and experiencing homelessness, having regular medical care was the strongest predictor of receiving cervical cancer screening.⁵² In another study, access to a primary care provider increased the likelihood of receiving a prostate-specific antigen-based screening test in people experiencing homelessness.³⁹ In a pilot study on skin cancer prevention, the establishment of low-threshold care was important for improving comprehensive patient care. People experiencing homelessness were able to access the clinic at a more convenient time and place and were therefore able to return when they needed follow-up care.⁵⁰ However, in this context, the health-care providers should use the opportunity of contact with people experiencing homelessness to emphasise the importance of cancer prevention and check the screening status of people experiencing homelessness.^{41,51} Studies found that counselling by a health-care provider (ie, providers discussing cancer prevention and the procedure), or absence thereof, was an important factor for obtaining cancer screenings.^{10–12,23,25,37}

Interventions to facilitate access to cancer prevention

Training for health-care providers and staff was recommended for several features: (1) provider counselling; (2) thorough explanation of the screening procedure to minimise stress, discomfort, and anxiety and to promote a positive screening experience; (3) trauma-informed care; and (4) strengthening interpersonal competencies, such as empathy, communication, respectful encounters, and creating a supportive environment.^{10,25,27,36,43,54}

Patient or peer educators who facilitate health education, schedule appointments, send reminders to patients to keep appointments, help obtain screening results, and accompany patients to screenings were effective.^{11,25} The use of health-navigation programmes or programmes tailored to the specific needs of people experiencing homelessness resulted in a higher

likelihood of screening uptake^{23,24,27} or other positive outcomes, such as increased return rates of faecal immunochemical tests, more returns to follow-up care, or the continuity of care.^{33,34,50}

Discussion

This Review aimed to map out the evidence of the exposure of people experiencing homelessness to known cancer risk factors and identify facilitators and barriers of people experiencing homelessness to accessing secondary cancer prevention services. The included studies were mainly conducted in the USA, indicating an empirical gap from other countries and continents. Since Asgary⁷ reviewed cancer mortality and access to cancer screening in people experiencing homelessness, covering a period of published studies up to 2017, an additional 14 eligible studies have been published, indicating this Review has a strong representation of recently published studies.

The most reported cancer risk factors in the included studies were tobacco use and alcohol misuse. Three studies found low sunscreen use among people experiencing homelessness.^{9,29,53} The results show that people experiencing homelessness are highly exposed to certain cancer risk factors, suggesting that primary prevention interventions tailored to people experiencing homelessness are urgently needed. Further, more research is needed on sexual risk practices and drug use in connection with cancer prevalence. No studies assessed genetic cancer risk factors or exposure to cancer-inducing substances, such as toxic chemicals or radiation, in people experiencing homelessness.

Facilitators and barriers to cancer screenings are linked to a variety of elements and practices, psychosocial and socioeconomic factors, and aspects of connectedness to the health-care system. These are categorised by level—individual, interpersonal, system, and policy—taking an ecological perspective to screening behaviour. Our Review suggests a dynamic interactive framework of factors determining cancer screening uptake. These factors might overlap, be inter-related, or influence one another. For instance, individual-level factors are related to the people experiencing homelessness themselves, but might be influenced by the broader social conditions in which they have experienced health care.²⁵

Most included studies on breast cancer screening and colorectal cancer screening reported screening rates less than 50%, which is below the US national average of 72% for breast cancer screening and 67% for colorectal cancer screening in a similar time period.⁵⁸ Twelve studies found relatively high rates of cervical cancer screening uptake among people experiencing homelessness, with screening rates between 54% and 98%.^{10,11,29,37,40,43,45,49,52–55} The screening rate for the US general population was 82.9% over a similar time period.⁵⁸ In the mapped studies, good uptake was explained by recruitment of participants in shelters, the often well established link

between homeless shelters and health-care facilities in the USA, regular medical care, and free tests through the public health system.^{24,37,52,53,55}

However, in most studies, people experiencing homelessness were recruited at homeless shelters, transitional housing units, or shelter-based clinics.^{9–12,22–26,31,34,37,41,44,47–49,51,52,56} Therefore, discrepancies might exist in the connection of these services (eg, shelters with health-care systems), the provision of preventive services within shelter-based clinics, or the extent to which medical providers are sensitised to preventive services for people experiencing homelessness.

Data from 2023 from across four European cities show that people experiencing homelessness and health professionals perceive there to be a lack of cancer prevention activity among people experiencing homelessness, and there is little evidence of tailored cancer prevention interventions for people experiencing homelessness in general.¹⁶ Only a few participants were in touch with screening programmes or knew of their existence. The scarcity of a prevention-oriented system across the four European settings led to cancer being diagnosed at a later, more advanced stage.¹⁶

Other authors have highlighted the pertinence of housing first to prevent or mitigate homelessness.^{59–62} When people who are experts by experience (ie, people who have previously experienced homelessness) were asked for their opinion, housing stabilisation was the top priority. Facilitating access to housing has been considered a premise for implementing health interventions for people experiencing homelessness, adjusted to their complex needs.^{2,59,63} Although some studies showed an effect of housing first on the mental health of people experiencing homelessness, the results of other studies are more conflicting and more evidence of housing stabilisation on health outcomes is needed.^{2,60,61}

Although studies emphasising the need to prevent homelessness engaged experts by experience in listing their priority needs, only some of the included studies in this Review engaged people experiencing homelessness from data collection to analysis,⁴⁴ used a person-centred method to let people experiencing homelessness decide themselves what is most important for them in terms of cervical cancer screening, or inquired on their recommendations to improve the screening experience.^{43,54,55} Participation of those directly affected by homelessness is not only pivotal for understanding their needs and capacities but also for co-developing solutions that are meaningful to them.

Cancer screenings are a multistage process, implying regular uptake, preparation, following up on test results, and taking necessary steps after positive results. Asgary and colleagues¹¹ commented on the follow-up of cervical cancer screening results: “the intended endpoints are often not achieved and subsequent necessary next steps that are instrumental part[s] of effective screening

programs are often missed in the homeless”. Equally, an intervention to enhance uptake and return rates of stool screening tests only led to a minor increase in colonoscopies after positive test results.³⁴ Achieving screening uptake and finishing the screening process might be associated with health literacy, having an established health-care provider, and the provision of proper counselling by that provider. A trusting relationship, non-judgemental and safe environment, positive screening experiences, and receiving explanations of each step of the screening process might influence continuity of care and regular uptake.

Interventions facilitating preventive care via social support or through a low-threshold procedure, such as navigation programmes,^{24,34} a person-centred model,²⁷ a programme to address specific needs of people experiencing homelessness,³³ and studies offering cervical cancer screening or dermatological care^{26,50} led to an increase in uptake of the services offered. Through these programmes, barriers at various levels might have been mitigated.²⁴ Interventions addressing training for providers, focusing on provider counselling and interpersonal competencies, and patient navigation programmes to facilitate health education and provide support in the screening process are essential. The results of a scoping review conducted in 2022 show that long-term patient navigation (ie, ≥6 months) for people experiencing homelessness, focusing on support and assisting with access to health care, was associated with receipt of timely health care.⁶⁴ Further, programmes tailored to the specific screening are pivotal, such as providing trauma-informed care and making provisions for privacy for bowel preparations.^{12,34}

Cancer risk practices and cancer screenings are inter-related. Being isolated, feeling lonely, and lacking support from family or friends influence cancer screening uptake and risk behaviours, such as smoking, drinking alcohol, or not getting enough exercise.⁶⁵ Further, studies found increased sun exposure, low access to or use of sunscreen and protective clothing, and limited access to dermatological care and skin cancer screening in people experiencing homelessness.^{50,66} A 2023 study from Denmark found a higher risk of skin conditions but lower rates of skin cancer in people experiencing homelessness compared with housed people. It is argued that skin cancer might be underdiagnosed in people experiencing homelessness due to inadequate dermatological screenings.⁶⁷ Effective strategies take a holistic approach by tackling primary and secondary cancer prevention, such as health education on cervical cancer screening, HPV testing and vaccines,¹⁰ skin cancer education, and better access to dermatological care.⁹

Most of the findings of this Review are contextually specific to the USA, indicating an absence of or little evidence in non-US contexts. Barriers and facilitators to cancer screening might depend mainly on the structural

circumstances and the awareness of cancer prevention as a priority. Further, the multifarious nature of homelessness engenders a wide variety of individualised experiences, not all of which could have been adequately accounted for with the European Typology of Homelessness and housing exclusion categorisation. In addition, the included studies yielded conflicting results (eg, regarding age or health insurance), which could be because of the heterogeneity of the studies (eg, differences in study design, methodology, sample size, and variables used). According to Joanna Briggs Institute guidelines,⁵⁷ we did not assess the quality of the studies or perform a risk of bias assessment.⁶⁸ Therefore, the inherent limitations of the studies could not be accounted for in this Review. Further, our ability to report on the prevalence of cancer risk factors among people experiencing homelessness is limited by the scarcity of studies providing estimates regarding the connections between risk factors and cancer in people experiencing homelessness or comparing the prevalence of cancer risk factors between people experiencing homelessness and the housed population. This limitation underscores the need for additional research to address these specific issues.

A strength of this Review is the adaptation of an ecological model for understanding the multiple inter-related factors at different levels influencing the uptake of cancer screening in people experiencing homelessness. In essence, there is a high need for an integrated, tailored, and inclusive approach to cancer preventive care for people experiencing homelessness that should consider this community's lived experiences by adopting co-designed interventions that foster active involvement of people experiencing homelessness in their development to address and overcome the systemic challenges this population currently faces.

Homelessness is a complex and multifaceted issue and, relatedly, facilitators and barriers to cancer screening among people experiencing homelessness concern many levels—from individual and interpersonal, to health-care system and policy levels. In the 2018 review, Asgary⁷ suggests improvements in data collection and assessments of the effectiveness of various approaches, the introduction of screening services at places where people experiencing homelessness access care, and addressing adequate housing. These recommendations are still pertinent, and with our updated review focusing on cancer risk and access to preventive services we expand on the earlier recommendations noting an essential need for a holistic view to understand cancer screening uptake and the designing of interventions. As the included studies show, providing a system of preventive services, accompanying and supporting people experiencing homelessness in the screening process, and creating a climate of trust, empathy, and support is crucial. Additionally, at the policy level, interventions should focus on advancing knowledge of

health-care staff on the relationship of health and homelessness, improving coordination of services and their flexibility, and making steps towards universal health insurance coverage.^{69–73} Ultimately, the participation of those directly experiencing homelessness, as well as decision makers and stakeholders responsible

Search strategy and selection criteria

We generated a comprehensive list of search terms (appendix pp 1–9) according to the population, concept, and context framework, from which research librarians of the Medical University of Vienna developed a search strategy. This search strategy was tested and applied by the research librarians in CINAHL, Embase, Global Index Medicus, PubMed, Scopus, and Web of Science, for studies published from database inception until the search on Feb 20, 2023. Grey literature was searched in Google, OpenGrey, and by contacting the European Federation of National Organisations Working with the Homeless (FEANTSA) to inquire about reports on the given topic. Grey literature was retrieved for the full-text reading on March 26, 2023, with no additional reports noted from FEANTSA. This Review was registered at OSF Registries (<https://doi.org/10.17605/OSF.IO/X78AJ>), and a protocol was prepared to guide the review process.

Eligible studies defined people experiencing homelessness as the study population, including people living in supportive, transitional, unstable, inadequate, or inappropriate housing. Studies that included people experiencing homelessness who had no history of confirmed cancer diagnosis and were aged 18 years or older were eligible. The concepts of interest included behavioural, social, and biological cancer risk factors among people experiencing homelessness and access (perceived or measured) to secondary cancer prevention services (ie, breast, cervical, colon, lung, prostate, and skin cancer screening). Included studies could be conducted in any country, with no language restrictions or limitations on social identifiers. Original research with quantitative (ie, clinical, social, and public health papers), qualitative, or mixed-methods study design, as well as grey literature (ie, unpublished studies and reports by non-government organisations), were deemed relevant.

Duplicate articles were removed before screening.

Two researchers (MJ and TS) independently performed the title and abstract screening using Rayyan. Four researchers (MJ, SH, TS, and IG) read the full texts and selected articles that were relevant according to the eligibility criteria and then extracted data in Microsoft Excel. Two reviewers (MJ and SH) further condensed this information. Four researchers (MJ, SH, TS, and IG) extracted data on study characteristics (eg, author, year, region, methodology, number of participants, age, and sex and gender) and key findings related to the review question (eg, screening rates, barriers, facilitators, and cancer risk factors). Discussion rounds were held within the authorship team to resolve questions, ambiguities, and the final inclusion of articles.

for formulating and implementing policies, will be essential to understand the needs of people experiencing homelessness and co-developing solutions that are meaningful to the local context.

Contributors

All authors conceptualised the research. MJ and TS reviewed all titles and abstracts. MJ, SH, TS, and IG read all full texts and extracted data. MJ and SH accessed and verified the data. MJ wrote the Review. All authors contributed to the editing of this Review and approved the final manuscript.

Declaration of interests

We declare no competing interests.

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