

Aim of the study: This study aimed at integrating research discussing the role of perceived psychosocial barriers in cervical cancer screening (CCS) uptake. In particular, we analyzed the evidence for the associations between CCS uptake and perceived psychosocial barriers and frequency of psychosocial barriers identified by women.

Material and methods: A systematic search of peer-reviewed papers published until 2011 in 8 databases yielded 48 original studies, analyzing data obtained from 155 954 women. The majority of studies ($k = 43$) applied correlational design, while 5 had experimental design.

Results: Experimental research indicated a positive effect of 75% of psychosocial interventions targeting barriers. The interventions resulted in a significant increase of CCS uptake. Overall 100% of correlational studies indicated that perceiving lower levels of barriers significantly predicted higher CCS uptake. 53 psychosocial barriers were listed in at least 2 original correlational studies: 9.5% of barriers were related to CCS facilities/environment, 67.9% dealt with personal characteristics of the patient, and 22.6% addressed social factors. As many as 35.9% of perceived barriers referred to negative emotions related to CCS examination procedures and collecting CCS results, whereas 25.7% of barriers referred to prior contacts with health professionals.

Conclusions: Leaflets or discussion on psychosocial barriers between patients and health professionals involved in CCS might increase CCS uptake and thus reduce cervical cancer mortality rates. Communication skills training for health professionals conducting CCS might focus on the most frequently reported barriers, referring to emotions related to CCS examination and collecting CCS results.

Key words: cervical cancer, screening, barriers, systematic review.

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Cervical cancer screening and psychosocial barriers perceived by patients. A systematic review

Alicja Bukowska-Durawa¹, Aleksandra Luszczynska^{1,2}

¹Chair of Clinical Psychology, Health and Rehabilitation, University of Social Sciences and Humanities, Wrocław, Poland

²Trauma, Health, & Hazards Center, University of Colorado, Colorado Springs, USA

Introduction

Cervical cancer screening (CCS) targets the reduction of cervical cancer incidence and mortality rates [1]. Unfortunately, in Eastern Europe cervical cancer is still a considerable public health problem, with high cancer incidence and low rates of CCS participation [2]. Differences in cervical cancer mortality trends can be plausibly explained by the differences in screening uptake [3].

Cervical cancer screening participation is influenced by women's beliefs. Perceived psychosocial barriers are among commonly listed psychosocial determinants of CCS uptake [4]. Perceived barriers predicted performance of 48 different health-related behaviors (including CCS) across 100 different populations [5]. The balance between perceived psychosocial barriers and facilitating factors prompts individuals to form a strong intention and then to act upon the intention [4]. Perceived barriers may refer to the characteristics of the individual (e.g., emotions, skills, self-evaluations), as well as the social (e.g., communication with health professionals) and physical environment (e.g., perceived distance to CCS facilities) [4, 6].

Research evaluating the prevalence of perceived psychosocial barriers and their role in CCS uptake yielded diverse conclusions. Systematic reviews aim at integrating and synthesizing the accumulated results by means of collating empirical evidence which fits pre-specified eligibility criteria, using explicit, replicable search and evaluation methods, selected to minimize biases [7]. In sum, systematic reviews allow for a summary of overarching findings after appraising the available evidence [7].

Applying the systematic review strategies, our study aims at integrating research discussing the role of perceived psychosocial barriers in CCS uptake. In particular, we analyzed the evidence for the associations between CCS uptake and perceived psychosocial barriers of any types, and types and frequency of psychosocial barriers identified by women residing in European, North American or Australian continents.

Material and methods

Search procedure

A systematic search of peer-reviewed journal papers published until 2011 was conducted in PsycINFO, PsychArticles, Health Source: Nursing/Academic Edition, Medline, and ScienceDirect. Applied key-words referred to CCS behavior (e.g., "cervical cancer screening") and barriers. No language restrictions were applied. Manual searches of the reference lists were conducted to identify additional sources. Two reviewers independently screened identified studies ($k = 655$). The search strategies, data abstraction and synthesis used systematic reviews' guidelines [7]. All steps were conducted by two researchers to reduce biases; any discrepancies were resolved by the consensus method [7].

Inclusion and exclusion criteria, categorizing, and data synthesis

The following research was excluded: studies with less than 50 participants, narrative reviews, dissertations, book chapters, studies conducted in Africa, Asia and South America (cultural/health system differences may influence the results [8]), research on objective economic indicators (e.g., actual income), research on ethnic minorities, immigrants, homeless populations. Studies with multicomponent interventions (i.e., interventions combining psychosocial barriers and other components) were excluded. If two or more studies used the same dataset, only one investigation was included. The screening process resulted in selecting 71 publications.

In the next step, the quality assessment was conducted using the quality evaluation tool [9], which allows one to investigate whether original studies adhere to 14 quality criteria, referring to objectives, methods, analyses, confounders, and results. The concordance coefficients for quality assessment were high ($\kappa \geq 0.71$, $ps < 0.01$). Descriptive data were extracted and verified by two reviewers. In sum, 48 studies met > 65% of quality criteria [9] and were further analyzed.

For the purpose of data presentation 10 broader barrier categories were proposed, referring to:

- the physical environment (CCS facilities),
- individual characteristics (perceived CCS-related financial expenses, time management, other priorities, CCS perceived as not needed, threat related to CCS results, emotional barriers, CCS awareness),
- social characteristics (a lack of social support, past experiences with health professionals).

Applying meta-analysis was not possible due to heterogeneity of methods. Thus, our analysis focuses on identifying significant findings, replicated in at least 2 studies.

Results

Analyzed studies predominantly applied correlational design (89.6%, $k = 43$), with 10.4% ($k = 5$) using experimental design (Table 1). Data from 155,954 women were analyzed ($M = 3249.04$, $SD = 10832.75$, minimum: 62, maximum: 66,425). The majority of studies were conducted in the U.S. (66.7%), 8.3% were conducted in Australia, 8.3% in Western Europe, and 10.4% in Eastern Europe. Across studies, 39.6% enrolled participants from the general adult population, 23.7% focused on women without valid CCS, and 23.7% focused on women aged 40+.

Experimental research indicated a significant positive effect of psychosocial barriers interventions on the main outcome in 75% of studies, resulting in an increase of CCS uptake (Table 1). The overall effects were small (Cohen's $d < 0.19$), with the largest study (17 008 participants) showing only a 1% increase of CCS participation. All interventions addressed mixed types of barriers. Therefore the identification of barriers responsible for the observed effect is not possible.

Across correlational research, 41.9% ($k = 18$) analyzed associations between psychosocial barriers and CCS. Overall, 100% of studies which analyzed barrier-CCS re-

lationships indicated that perceiving lower relevance of barriers significantly predicted CCS uptake. The remaining 51.1% of studies focused on eliciting frequently reported barriers, without analyzing barrier-CCS associations.

Overall, 53 psychosocial barriers were listed in at least 2 original correlational studies. Five barriers were related to CCS facilities/environment, 36 dealt with personal characteristics, and 12 addressed social factors. Table 2 displays a summary of barriers elicited in the review.

Cervical cancer screening facilities-related perceived barriers referred to: long distance/transportation to CCS facilities (25.6% of correlational studies listed this barrier), difficulties in making a feasible appointment (18.6%), long waiting time (7.0%), long lines (4.7%), and discomfort if CCS is done at the workplace (4.7%).

Personal barriers referring to time management included: no childcare (11.6% of studies), tendencies to procrastinate (11.6%), a lack of time for CCS (9.3%), perceiving CCS as time-consuming (4.7%), and bad weather causing delays (4.7%). Additional costs, related to CCS uptake, were indicated in 23.3% of studies. Barriers related to other priorities included: having other diseases (16.3%), having other priorities (16.3%), and other personal problems (7.0%). The following barriers referring to beliefs that CCS is not needed were elicited: CCS is not needed if there are no symptoms (11.6%), overall no need for CCS (9.3%), not needed for women my age (4.7%), CCS not needed if there is no sexual activity (4.7%), CCS not important (4.7%). Awareness-related barriers included: difficulties in obtaining reliable CCS information (9.3%), a lack of awareness about the need for CCS (7.0%), and confusing CCS information (7.0%). Two remaining barrier categories dealt with emotional aspects. The first one referred to CCS results: beliefs that it may be too late to apply successful treatments (11.6%), being afraid of detecting other diseases (7.0%), unwillingness to learn if results indicate diseases (7.0%), any results perceived as emotionally disturbing (7%), no trust in CCS results (4.7%), being afraid of bad news (4.7%), avoiding problems if CCS is not performed (4.7%), and being afraid of any CCS results (4.7%). Other emotion-related barriers referred to CCS examination and included: shame (11.6%), being afraid of embarrassment (9.3%), embarrassment (9.3%), discomfort (9.3%), CCS being unpleasant (9.3%), being afraid of CCS (9.3%), pain (4.7%), not liking CCS (4.7%), touching during CCS being unpleasant (4.7%), being nervous during CCS (4.7%), and perceiving conversations about CCS as unpleasant (4.7%).

Perceived social barriers, referring to prior experiences with health professionals, included: prior CCS contacts perceived as an overall bad experience (16.3%), male physicians performing CCS (11.6%), CCS not recommended by a family physician (11.6%), unsatisfactory contacts with physicians (7.0%), a lack of women-friendly CCS facilities (4.7%), different physicians performing CCS (4.7%), a lack of CCS discussion with a physician (4.7%), unsatisfactory contacts with healthcare personnel (4.7%), being patronized (4.7%). Barriers referring to social support included: a lack of CCS-related support (4.7%), being afraid that others would learn about results (4.7%), family/friends are not supporting CCS participation (4.7%).

Table 1. Overview of analyzed studies

First author and publication year	Methods	Main results
Experimental studies		
Valanis <i>et al.</i> (2002) [10]	510 women; RCT, 14-month follow-up; intervention: phone-based discussion + leaflets on multiple barriers	Significant differences in CCS uptake at follow-up. Participating in the intervention increased the likelihood of CCS; OR = 2.9, CI: 1.7–5.9
Fernbach <i>et al.</i> (2002) [11]	1301 Australian women; CT; mass-media campaign discussing multiple barriers	No significant effects (Cohen's $d = 0.08$)
Corkey <i>et al.</i> (2005) [12]	17008 Australian women; 6-month follow-up; automated phone message on multiple barriers	Significant effects on CCS: women aged > 50: 0.16% increase; women aged ≥ 50 : 1.35%
Dietrich <i>et al.</i> (2007) [13]	1316 women; aged 40+; RCT; 6-month follow-up; intervention: individualized phone message on barriers for three types of screening (cervical, colon and breast cancer)	Significant effects at follow-up: OR = 1.86 (CI: 1.1–3.21)
Luszczynska <i>et al.</i> (2011) [14]	1436 Polish women; RCT, post-test; intervention: leaflet on CCS barriers and benefits	Significant increases in CCS intention (Cohen's $d = 0.19$)
Correlational studies		
Peters <i>et al.</i> (1989) [15]	200 women with CC diagnosis and 200 women without CC diagnosis	A lack of regular CCS associated with embarrassment barriers
Mamon <i>et al.</i> (1990) [16]	290 women of lower socio-economic status	Frequently reported barriers: CCS is not recommended by the primary care physician
O'Brien <i>et al.</i> (1990) [17]	186 women	A lack of regular CCS associated with higher psychosocial barriers
Jubelirer <i>et al.</i> (1996) [18]	134 sexually active girls aged 14–18	Frequently reported barriers: shame/embarrassment (64%), discomfort during CCS exam (57%), fear about parents being informed (25%), fear of cancer (27%)
Barling <i>et al.</i> (1996) [19]	72 women	Frequently reported barriers: embarrassment, discomfort during CCS exam
Price <i>et al.</i> (1996) [20]	127 women; no regular CCS participation	Frequently reported barriers: forgetting about CCS (32%), not liking CCS examination (32%)
Branoff <i>et al.</i> (1997) [21]	214 women; no CCS in prior 3 years	Frequently reported barriers: financial costs (65%), shame/embarrassment (38%), unclear information about CCS exam (36%)
Fitch <i>et al.</i> (1998) [22]	110 Canadian women	Frequently reported barriers: a lack of communication with physicians, physicians lack communication skills, difficulty in obtaining reliable information about CCS, CCS examination unpleasant
Larsen <i>et al.</i> (1998) [23]	1725 Danish women	Frequently reported barriers: unsatisfactory contacts with physicians, discomfort during CCS examination
Kiefe <i>et al.</i> (1998) [24]	1764 women aged 43+	Compared to healthy women those with a chronic disease have 20% lower CCS participation
Yu <i>et al.</i> (1998) [25]	650 British women	Frequently reported barriers: embarrassment/discomfort during CCS exam
Girgis <i>et al.</i> (1999) [26]	788 women living in rural Australia	Frequently reported barriers: CCS being performed by a male (28–46%), physician performing CCS is a neighbor/friend (27–34%), long distance to CCS facilities (23–35%), a lack of symptoms (26–35%)
Glasgow <i>et al.</i> (2000) [27]	522 women aged 52+	CCS barriers reported as most relevant: being overall healthy/no symptoms (26%), embarrassment (22%), time/location inconvenient (26%), "a bad experience" with previous CCS (31%), don't want to know results if they indicate disease (13%), long waiting for CCS exams (13%), family/friends do not perform CCS (9%), it may be anyway too late to apply successful treatment (4%)

Table 1. Continue

First author and publication year	Methods	Main results
Egbert <i>et al.</i> (2001) [28]	260 women from rural regions	CCS related to lower perceived barriers; higher support for CCS from important persons
Maxwell <i>et al.</i> (2001) [29]	33 817 Canadian women	Only 0.6% declared that accessibility is a perceived barrier; among women without regular CCS 53% believed they don't need CCS
Savage <i>et al.</i> (2001) [30]	1200 women aged 50+	CCS participation related to lower barriers
Eaker <i>et al.</i> (2001) [31]	944 Swedish women	CCS related to lower barriers (i.e., time management, other priorities, other personal issues more important, a lack of symptoms, CCS invitations irritating, being afraid of cancer detection, talking/thinking about cancer increases negative emotions)
Eiser <i>et al.</i> (2002) [32]	70 women aged 20–25	CCS participation related to lower perceived barriers
Owen <i>et al.</i> (2002) [33]	100 Australian psychiatric patients	Frequently reported barriers: shame/embarrassment (18%), prior CCS was an unpleasant experience (12%), CCS facilities difficult to reach (4%), gender of person performing CCS important (51%)
O'Malley <i>et al.</i> (2003) [34]	12024 women aged 50+	Among women with lower socioeconomic status key CCS barriers include additional financial costs and distance to CCS facilities
Smith <i>et al.</i> (2003) [35]	68 women	Frequently reported barriers: other priorities, embarrassment, being afraid of cancer detection, disgust, problems with making CCS appointment
Finney <i>et al.</i> (2004) [36]	66425 women, longitudinal study; 3 measurement points (years 1987, 1992, and 2000)	Frequently declared barriers: not sure if in need for CCS (8% in 1987; 11% in 2000); CCS not suggested by primary care physician (3% in 1987; 2% in 2000)
Behbakt <i>et al.</i> (2004) [37]	146 women	Frequently reported barriers: low support for CCS, fatalism, a belief that it may be too late for a successful treatment
Hewitt <i>et al.</i> (2004) [38]	2344 women without CCS in prior 3 years	Frequently reported barriers: seeing no reason for CCS (48%), CCS not recommended by primary care physician (10%), no symptoms (9%), additional financial costs (9%), no need for any examinations (8%)
Coronado <i>et al.</i> (2004) [39]	764 women	Frequently reported barriers: dislike being touched (9–24%), being afraid of cancer detection (19–32%), being afraid of other diseases being detected (19–25%), male physician (31–76%), extra financial costs (37–41%), difficult to leave work earlier (16–22%), transportation (11–22%), long waiting time (17–27%)
Markovic <i>et al.</i> (2005) [40]	62 Serbian women	Frequently reported barriers: a lack of women-friendly clinics, other personal priorities
Hoyo <i>et al.</i> (2005) [41]	144 women aged 45+	Frequently reported barriers: CCS is painful
Walsh <i>et al.</i> (2006) [42]	1000 women	Barriers related to low CCS participation: CCS is time-consuming, makes me nervous; being afraid before CCS exam
Guilfoyle <i>et al.</i> (2007) [43]	98 women aged 50+	Frequently reported barriers: embarrassment, fear of pain, transportation, prior experiences with CCS negative
Liu <i>et al.</i> (2008) [44]	630 women aged 40+	Barriers related with low CCS participation: transportation, other health problems
Politi <i>et al.</i> (2008) [45]	605 women aged 40+	Barriers related with low CCS: other health problems, transportation, difficulties in organizing childcare
Ross <i>et al.</i> (2008) [46]	204 female physicians	Frequently reported barriers: time management (36%), no gynecologist providing regular consultations (11%), discomfort if CCS performed at workplace (9%)
Todorova <i>et al.</i> (2009) [2]	2152 Bulgarian (BUL) and Romanian (ROM) women	Barriers related to low CCS. Frequently reported barriers: physicians are not interested in CCS (16–45%), CCS not recommended by a family physician (23–44%); examination is unpleasant (32–39%), waiting for a long time for the appointment (25–38%), additional financial costs (36–35%)

Table 1. Continue

First author and publication year	Methods	Main results
Waller <i>et al.</i> (2009) [47]	580 British women	Frequently reported barriers: embarrassment (29%), difficulties in implementing intentions (21%), fear of pain (14%). Barriers related to low CCS: difficulties in making CCS appointment; difficulties in implementing intentions; CCS is not essential; CCS not needed if no sexual activities, low trust in CCS results
Spaczyński <i>et al.</i> (2009) [48]	1638 Polish women aged 25–59 (77.5% with valid CCS)	Participants asked to indicate one key barrier reported: a lack of time (24%), not liking CCS exam (15%), no need for CCS (7%), long distance to CCS facilities (7%), no date/time specified in CCS invitation (6%), physician unknown and thus unacceptable (6%), fear of CCS exam (4%), difficulties in making appointment (4%), male physician (3%), physician is unacceptable (1%)
Clark <i>et al.</i> (2009) [49]	630 women aged 40+	Barriers related to low CCS: presence of other diseases
McAlearney <i>et al.</i> (2010) [50]	100 women	Frequently reported barriers: additional financial costs
Tello <i>et al.</i> (2010) [51]	200 HIV+ women	Frequently reported barriers: forgetting (61%), other diseases (52%), difficulties in making appointment (31%), fear of bad news (15%)
Wall <i>et al.</i> (2010) [52]	229 Mexican women	Barriers related to low CCS participation: it may be anyway too late to apply successful treatment, a partner does not accept CCS
Scarinci <i>et al.</i> (2010) [53]	130 women previously diagnosed with cervical pathology	Barriers related to low CCS participation: additional costs, difficulties in organizing childcare
Tracy (2010) [54]	225 women	Psychosocial barriers related to low CCS participation
Paskett <i>et al.</i> (2010) [55]	562 women	Barriers related to low CCS participation: high number of stressful events
Ullman-Włodarz <i>et al.</i> (2011) [56]	250 Polish women	Participants asked to indicate one key CCS barrier reported: fear of pain (39%), no symptoms (18%), own carelessness (15%), shame (12%), CCS not recommended by a physician (11%) fear of bad news (5%)

Data collected in the U.S., unless indicated otherwise; experimental studies focused on women who did not perform CCS on regular basis; participants of correlation studies were adult women (with or without a recently conducted CCS) through lifespan, unless indicated otherwise
CCS – cervical cancer screening

Table 2. A summary of elicited psychosocial barriers

Category	Barriers listed in at least 2 studies CCS facilities/environment	Patients' personal characteristics	Social factors
Examples	Long distance/transportation to CCS facilities Difficulties in making appointments	Time management (e.g., no childcare replacement); Additional costs Other priorities (e.g., having other diseases) CCS is not needed (e.g., no need if no symptoms) Awareness-related barriers (difficulty in obtaining reliable CCS information) Emotional barriers dealing with CCS results (e.g., it may be anyway too late to apply successful treatments) Emotional barriers referring to examination (e.g., discomfort)	Experiences with health professionals (e.g., unsatisfactory contacts with physicians) A lack of social support (e.g., family/friends don't support CCS participation)
Percent of studies indicating the barrier	9.5%	67.9%	22%

CCS – cervical cancer screening

Research targeting women aged 40+ highlighted the importance of perceived problems with transportation/distance to CCS facilities and other diseases perceived as hindering CCS uptake. Both barriers were indicated in 55.6% of studies conducted among middle-to-older age women.

Discussion

The results of the systematic review suggest that perceiving psychosocial barriers is related to lower participation in CCS (100% of reviewed correlational studies). These associations were observed across different samples, such as adolescents, older women, economically disadvantaged groups, female doctors, patients with a chronic illness, women who performed CCS regularly, and those who did not perform CCS.

The majority of simple psychosocial interventions discussing perceived barriers affected CCS participation (75% of reviewed experimental studies). In particular, all interventions using leaflets/handouts or automated phone message resulted in a significant increase of CCS at follow-ups. A media-based campaign had a negligible influence on CCS participation. Importantly, the observed effects of these interventions were small.

In line with previous research [6], a broad range of psychosocial barriers was identified. The majority of barriers dealt with personal characteristics of women (67.9%). In particular, as many as 35.9% of perceived barriers referred to two categories, one referring to negative emotions evoked during CCS examination and the other focusing on negative emotions related to receiving CCS results. Notably, the next broadest category of barriers concerns prior contacts with health professionals (25.7%).

Our findings have some practical implications. Leaflets discussing dealing with barriers women perceive and ways of overcoming those barriers might be a powerful tool to increase CCS uptake and thus reduce cervical cancer mortality rates. Communication skills training for health professionals conducting CCS and primary care physicians may focus on psychosocial barriers reported by patients. Research suggested that compared to standard care, training physicians to discuss psychosocial barriers results in a higher likelihood of implementing health behavior change by their patients [57].

Several limitations of this systematic review result from issues identified in original studies. Trials applied various questionnaires, sampling, and analytical strategies, therefore the heterogeneity in the methodology hinders any conclusions. The character of samples adds to the heterogeneity of the results and limits conclusions about the most frequent type of barriers within specific subsamples. Regardless of the limitations, this systematic review provides an insight into the types of barriers perceived by women and their role in cervical cancer screening uptake.

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Address for correspondence

Prof. Aleksandra Luszczynska
Trauma, Health, & Hazards Center, University of Colorado
1861 Austin Bluffs Pkwy
80918 Colorado Springs, CO
United States
e-mail: aluszczyn@uccs.edu

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