

# Screening for cervical cancer among Israeli lesbian women

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**Background:** The proportion of lesbian women who contract the human papilloma virus may reach 13% or even 21%; however, lesbian women were found to receive Pap smear tests less often or less regularly.

**Aim:** To explore factors influencing lesbian women to undergo Pap smear tests and to determine whether the Health Belief Model (HBM) is able to predict whether lesbian women would be willing to undergo the test.

**Method:** This is a correlational quantitative study guided by the HBM. A convenience sample of 108 Israeli lesbian women was recruited from local events in the lesbian community in the city of Tel Aviv, Israel. Data were collected using a self-administered questionnaire.

**Findings:** Findings indicate that only 22.2% of the women had undergone Pap smear tests in the past, but a slightly higher proportion, 30.8%, intended to be tested during the next year. Older women were found to be more compliant with the test. Model-based factors affecting actual testing were perceived benefits and barriers. Factors affecting women's intention to be tested were perceived susceptibility, perceived benefits and general health motivation.

**Conclusions:** Effective strategies for nurses promoting cervical cancer screening among lesbians should address ways to improve familiarity with Pap smear tests, raise physicians' awareness of offering the test to lesbians and emphasize the importance of women-based medical teams.

**Keywords:** Health Belief Model, Israeli Lesbian Women, Pap Smear Test

## Introduction

Worldwide, cervical carcinoma is one of the most common gynecologic malignant tumors and a leading cause of death from genital malignancies in women. The mortality rate from cervical cancer has significantly diminished in the last 45 years because of the availability of Papanicolaou smear screening (Pap test) (Greenlee et al. 2001). Data from the Israeli Cancer Registry show that Israel has a relatively low incidence of cervical cancer of 28 per million population (based on 184 new

cases occurring annually during the 2000–2005 period) compared with 82 per million worldwide. Israel's low incidence rate can be partly explained by a widespread abstinence from premarital sexual relations in all the religious (Jewish, Moslem and Christian) sectors of society, the practice of male circumcision among Jews and Moslems (Drain et al. 2006) and possibly the religious prohibition of the family purity laws of orthodox Jews from having sexual intercourse both during menses and 6–7 days after its complete cessation (Menczer 2003). Lesbians seem to be a group who are not risk-free in relation to cervical cancer, although the latter risk factor may be confounded by other risk factors such as multiple partners and smoking. One study reported that lesbians perceived themselves to be less susceptible to cervical cancer than heterosexual or bisexual women

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even though 79% of the lesbians in their sample had had a history of sexual intercourse with a man (Price et al. 1996).

### Literature review

The term 'lesbian' describes women's sexual identity, while 'women who have sex with other women' describes sexual behaviour. Sexual identity is not necessarily an indication of sexual behaviour – a considerable number of lesbian women have a history of sexual relations with men (Hughes & Evans 2003). In addition, it is important to understand that sexual behaviour has a wide range: from past to present behaviour, from sexual behaviour reflecting personal preferences to behaviour that does not reflect personal preferences and from reported to unreported behaviour (Carroll 1999). In order to simplify matters, the present study will use the term 'lesbian' to designate women who have sex with other women. These women comprise 8–20% of the population of US women (Marrazzo 2004), while no data exist concerning the extent of this population in Israel.

The prevalent view is that lesbian women are not susceptible to sexually transmitted diseases, aside from extremely exceptional cases, mainly because their sexual relations are perceived as not involving penetration (Bailey et al. 2004; Ravinerson et al. 2005). This perception is wrong and even dangerous – lesbian women are susceptible to sexual diseases to the same degree as all other women (McNair 2003; Ravinerson et al. 2005). One of the reasons is that 75–80% of lesbian women report current or former heterosexual relations (Carroll 1999; Price et al. 1996), mostly without protection (Carroll 1999).

Risk factors for contracting sexual diseases are many and varied and they depend on sexual tendencies, the number of partners and the types of sexual activity (Carroll 1999). Sexual activity among lesbian women may include oral–vaginal sex, oral–anal sex, and vaginal and anal penetration with hands, fingers or sex toys (Marrazzo 2004).

The proportion of lesbian women who contract the human papilloma virus (HPV) may reach 13% or even 21% (Ravinerson et al. 2005), even among lesbians who never had sexual relations with men (Liebert 2003), as infection can occur through skin/body contact or through salivary contact (for example, sex toys that have not been sterilized) (Marrazzo 2004).

Risk factors for contracting cervical cancer, aside from infection by the HPV, also include smoking (Bailey et al. 2000; Idstrom et al. 2002). Avoiding or irregular performance of Pap tests is a risk factor for later diagnosis and treatment, with possible worse outcomes (Carroll 1999). Lesbian women were found to have a higher prevalence of smoking than heterosexual women (Carroll 1999; Ravinerson et al. 2005) and they receive Pap smear tests less often or less regularly (Carroll 1999; Liebert 2003; Marrazzo 2004).

Regardless, lesbian women consume less health services and postpone testing more than heterosexual women (Carroll 1999). They also consume less preventive medical services (Diamant et al. 2000). One of the reasons is the medical personnel's unawareness of lesbian women's unique medical needs (Carroll 1999). Other reasons are unawareness of the significance of preventive screens, limited financial ability (Diamant et al. 2000) because of women's low income and the absence of a man in the household, and of course the lack of health insurance (Marrazzo et al. 2000). In addition, lesbian women are also deterred by their concern about the medical personnel's reactions to their sexual identity (Diamant et al. 2000).

An important factor explaining the low prevalence of Pap tests among lesbian women is the belief of their low susceptibility to cervical cancer, even if they engaged in heterosexual relations in the past (Marrazzo et al. 2000; O'Hanlan & Crum 1996; Price et al. 1996).

### The conceptual framework

The Health Belief Model (HBM) served as the theoretical framework of this study. The HBM, developed by Becker (1974), aims to explain preventive health behaviours rather than behaviours in time of illness. Major health behaviours emphasized by the HBM focus on prevention or exposure of diseases at their asymptomatic stage (Lee 2000). HBM assumes that health behaviours are motivated by five elements:

#### Perceived susceptibility

The perceived risk of contracting a disease refers to individuals' subjective perception of their susceptibility to the disease. In the current study, this refers to lesbian women's perceived susceptibility to cervical cancer.

#### Perceived severity

The perceived severity of the disease refers to the severity of the health problem as assessed by the individual. In the current study, this refers to the possible severity and implications of the consequences of women's avoidance of Pap smear tests.

#### Perceived benefits

Individuals' perception of their susceptibility to the disease and their conviction of its severity are the forces motivating them to act, i.e. the benefits of performing Pap smear tests.

#### Perceived barriers

Perceived barriers to action refers to the negative aspects of health-oriented actions or which serve as barriers to action and/or that arouse conflicting incentives to avoid action. In the

current study, this refers to those barriers and obstacles that prevent women from being tested (Austin et al. 2002).

### General health motivation

Health motivation refers to individuals' level of interest in health issues, their wish to reach or maintain a positive state of health and to avoid a state of illness (Gillam 1991).

Reviews of research involving HBM across a wide range of health behaviours indicate that these five dimensions are able to provide reliable, though weak, predictions of health behaviour (Harrison et al. 1992; Janz & Becker 1984; Sheeran & Abraham 1996). For example, a meta-analysis conducted by Harrison et al. (1992) indicated that although the HBM variables were significant predictors of health behaviour, the amounts of variance explained by the five dimensions were relatively small. The HBM does not directly address attributions of cause or individual definitions of cervical cancer; however, it appears to be a salient framework for describing cervical cancer screening. The utility of the model should be evaluated with respect to its ability to predict behaviour, and therefore provide nurses with a blueprint for intervening with women as they respond to the threat of cervical cancer.

A review by Orbell & Sheeran (1993) identifies a number of factors which may be associated with the performance of cervical screening. However, very few studies on the uptake of cervical screening have based their research design or the interpretation of their findings on a social cognition model, and neither meta-analysis previously mentioned included a study of uptake of cervical screening.

In addition, aside from the variables included in the model, the present study examined another dependent variable – intention to be tested over the next year. According to the Theory of Reasoned Action (Ajzen & Fishbein 1980), behavioural intention is shaped by individual attitude, and attitude is influenced by the specific behaviour expected to lead to certain outcomes, particularly, behavioural intention to take Pap tests. Thus, each stage of adoption was used in this study as follows: (a) maintenance phase: the woman has had a Pap test once a year regularly and plans to continue once a year, (b) action phase: the woman has had the test irregularly but plans to have it once a year in the future, (c) preparation phase: no experience but plans to have the test once a year, (d) contemplation phase: no experience but plans to have it sometime, and (e) pre-contemplation phase: no experience and no plans for the future.

Aside from the variables included in the model, the study examined additional variables, such as demographic data, familiarity with the disease and the test, and prior experience with the test.

### Purpose

The purpose of this study is to determine the factors that influence lesbian women to undergo Pap tests and also to determine whether the HBM (Becker 1974) is able to predict whether lesbian women would be willing to undergo the test.

### Methods

#### Design

This is a correlational quantitative study.

#### Instrument

After performing a comprehensive review of the literature on knowledge and health belief perceptions of cervical cancer, a 64-item instrument was developed. Six professional experts in the fields of nursing and public health examined the content validity of the scales developed for the study. The experts were asked to rate each item on each scale for feasibility and relevance. A four-point rating scale was used as follows: 1, not relevant; 2, unable to assess relevance without item revision; 3, relevant but needs minor revisions; and 4, very relevant and succinct. The number of items rated by experts as 3 and 4 divided by the total numbers of items was calculated as the Content Validity Index (CVI) of the scale. The CVI for all the scales ranged from 0.90 to 1.00, which indicated that all the scales were acceptable for further use.

The instrument included 11 demographic items: education, age, income, race, religion, marital status. Also included in the questionnaire were two background questions about Pap smears: Pap smear compliance, history of pap smears. The questionnaire also contained 13 knowledge items about Pap smears. The total scores ranged from 0 to 13. The remaining questions were subscales based on the HBM with 6-point Likert-type scales: 1 = strongly disagree to 6 = strongly agree, for perceived susceptibility to the disease (three items), perceived severity of the disease (six items), perceived benefits of Pap tests (four items), perceived barriers to performing Pap tests (11 items) and health motivation (nine items).

In addition, the developers of the tool conducted pilot studies with 20 Israeli lesbian women and checked the internal consistency using Cronbach's alpha. After pilot testing, no modification was made. The internal consistency was: for perceived susceptibility to the disease – 0.75; for perceived severity of the disease – 0.89; for perceived benefits of Pap tests – 0.762; for perceived barriers to performing Pap tests – 0.797; for knowledge – 0.718; and for health motivation – 0.74.

#### Participation and sampling method

One hundred and fifty questionnaires were distributed by the researchers at the entrance to local events in the lesbian

community in Tel Aviv; 108 (72%) questionnaires were completed and returned on site. One hundred and eight Israeli lesbian women aged 18–41 participated in the study, mostly from Tel Aviv and the region. These women belonged to the population for whom Pap tests are recommended and they were selected in a convenience sample.

#### **Ethical considerations and data collection**

Approval to conduct the survey was obtained from the Nursing Department of the Tel Aviv University prior to conducting the survey in 2007. The data were collected by questionnaires distributed personally at the entrance to local events in the lesbian community in Tel Aviv. The questionnaires assured subjects of their complete anonymity, as well as of their right to refuse to participate in the study. A signed informed consent was obtained. Each questionnaire required approximately 20 min to complete. Confidentiality of the responses was ensured through the use of coded numbers rather than participants' names.

#### **Data analysis**

The data were analysed using SPSS statistical software (Version 12.0; SPSS Inc., Chicago, IL, USA). Descriptive statistics were employed, including means, standard deviations, percentages and ranges of the research variables. Chi-square analyses were used to examine differences between the health beliefs and health motivation of women who comply and do not comply with the test, and *t*-tests and discriminant analysis were used in order to examine differences between the beliefs and motivation of the various age groups. In addition, Pearson correlations for beliefs and motivation were calculated in order to examine their correlation.

## **Results**

#### **Demographics**

The research population mainly included young women aged 18–29, who comprise 77.8% of the research population. Most of them were Jewish (97.2%), secular (89.8%) and single (94.4%). In addition, most of them were born in Israel (88.9%) and are of Ashkenazi origin (60.7%), in this case determined according to the mother's country of origin. A total of 52.8% of the subjects have a graduate degree, 26.9% have a high school education and 19.4% have an undergraduate degree/professional course. Most of the women were employed, and about half (57.9%) earn a below-average income (see Table S1).

#### **Familiarity with the test and sources of knowledge**

The questionnaire included an item that examined subjects' familiarity with the test, in the form of the question: 'Have you

ever heard of Pap tests?' The findings indicate that 59.3% of the women are familiar with the test, while 39.8% have not heard of it.

Another variable related to knowledge and examined in the questionnaire is sources of information regarding Pap tests (see Table S2). It seems that a significant portion of the women (43.5%) had not received any information about the test, and their main source of information was friends/relatives (25.9%). This was followed by gynecologist/general practitioner (15.7%), Internet/books (12.9%) and finally all the rest.

#### **Compliance with the test**

Compliance with the test was assessed on dichotomous measures: retrospectively – the women's report on undergoing Pap tests in the past, the number of times they were performed and when they last had a Pap test; prospectively – the women's report of their intention to be tested over the next year.

Findings indicate that only 22.2% of the lesbian women had undergone Pap smear tests in the past, of which 77.4% have undergone the test once and all carried out this year. However, a slightly higher proportion, 30.8%, intended to be tested over the next year. Distributed by age groups, differences were found between the groups in their rates of actual testing and intention to be tested in the future. Most of the young women had never been tested (84.5%) and did not intend to be tested over the next year (73.5%). In contrast, among the older women, no differences were found between the rates of implementation and their intention to be tested over the next year (45.8% had been tested and intend to be tested, 54.2% had not been tested and do not intend to be tested); however, their rate of compliance was clearly higher than that of the younger women.

According to the means presented in Table 1, it seems that younger women have higher perceived barriers, and a paired samples *t*-test found a significant difference of  $P = 0.006$  between the two age groups. A *t*-test found significant differences in regard to health motivation as well,  $P < 0.01$ , and it seems that the motivation of older women is greater than that of younger women.

#### **Relationship between beliefs and health motivation – and compliance with Pap tests**

##### *Performing the test*

Most of the research hypotheses relate to possible connections between women's compliance with Pap tests and their general health beliefs and health motivation. In the variance analyses held for each of the variables, significant differences were found between the perceived benefits of the test ( $P = 0.0000$ ) and its perceived barriers ( $P < 0.05$ ) among women who had been tested and those who had not.

Table 1 Means and standard deviations of beliefs and health motivation by age groups

Age		Susceptibility	Severity	Benefits	Barriers	Motivation
18–29	Mean	3.67 ± 1.23	5.18 ± 0.86	4.44 ± 1.17	2.69 ± 0.75	3.73 ± 0.94
30+	Mean	3.81 ± 1.44	5.01 ± 1.07	4.71 ± 1.29	2.18 ± 0.77	4.53 ± 0.92
Total	Mean	3.70 ± 1.27	5.14 ± 0.91	4.49 ± 1.19	2.58 ± 0.78	3.89 ± 0.99

Means ranged from 1 to 6.

Table 2 Means and standard deviations of beliefs and health motivation as correlated with performance of Pap tests

		Susceptibility	Severity	Benefits	Barriers	Motivation
Performed test	Mean	4.04 ± 1.69	5.37 ± 0.86	5.38** ± 0.91	2.21* ± 0.76	4.11 ± 0.97
Did not perform test	Mean	3.61 ± 1.12	5.08 ± 0.91	4.25** ± 1.15	2.68* ± 0.76	3.84 ± 1.00

\* $P < 0.05$ ; \*\* $P = 0.0000$ .

Means ranged from 1 to 6.

Table 3 Means and standard deviations of beliefs and health motivation as correlated with intention to be tested

		Susceptibility	Severity	Benefits	Barriers	Motivation
Intend to be tested	Mean	4.28* ± 1.47	5.14 ± 1.02	5.26** ± 0.87	2.55 ± 0.88	4.19* ± 0.96
Do not intend to be tested	Mean	3.44* ± 1.09	5.15 ± 0.86	4.17** ± 1.16	2.61 ± 0.74	3.77* ± 0.99

\* $P < 0.05$ ; \*\* $P = 0.0000$ .

Means ranged from 1 to 6.

According to the means presented in Table 2, we can see that the group of women who were tested is characterized by high-perceived benefits and low-perceived barriers. In addition, measures of susceptibility to the disease, its severity and health motivation, were also found to be higher among women who had been tested compared with those who had not, however not significantly so.

#### *Intention to be tested in the future*

As stated, the second variable related to compliance was the intention to be tested over the next year. Table 3 presents means and standard deviations of these two groups.

In variance analyses held for each of the variables, significant differences were found between women who intend to be tested in the future and those who do not in their perceived susceptibility to the disease ( $P < 0.05$ ), perceived benefits of the test ( $P = 0.0000$ ) and their general health motivation ( $P < 0.05$ ). Table 3 shows that the group of women who intend to be tested

is characterized by higher perceived susceptibility to the disease and benefits of the test, as well as having higher general health motivation. In addition, a lower level of perceived barriers was found among women who intend to be tested, although this finding was not statistically significant. In contrast, perceived severity of the disease was found to be slightly higher among women who do not intend to be tested.

In order to examine to what degree belief and motivation measures discern between women who intend to be tested and women who do not intend to be tested over the next year, as well as to assess the unique contribution of each of these measures to this distinction, a discriminant analysis was performed.

This analysis led to the following standard function:

$$\text{Motivation} \times 0.248^* - \text{Barriers} \times 0.052 + \text{Benefits} \times 0.734^{**} + \text{Severity} \times 0.240 + \text{Susceptibility} \times 0.567^* = \text{Intention to be tested or not to be tested}$$

where \* $P < 0.05$  and \*\* $P = 0.01$ .



The equation indicates that perceived benefits have the greatest contribution to the distinction between the two groups, followed by susceptibility and motivation, and last of all, the other variables. It is notable that benefits had a significant contribution to predicting which women intend to be tested in the future and which women have performed the test. In contrast, women's perceived severity of the disease was not a significant predictive measure among either of these two groups.

Categorization by groups according to the discriminant function was better for intention than for performance of the test. The sum of all five belief measures leads to an accurate prediction of 71.9%, i.e. approximately 22% more than the prediction ability with random distribution.

In summary, a connection was found between compliance and the various health beliefs, and this connection is stronger in regard to intention to be tested than to actual performance of Pap smear tests.

#### Relationship between health motivation and beliefs concerning cervical cancer

Table 4 shows that in regard to the entire sample, significant correlations were found between general health motivation and perceived benefits of the test, i.e. the higher the perceived benefits – the higher the motivation. Benefits were found to be significant only among the group of younger women, while no significant correlations were found with regard to any of the other health beliefs.

**Table 4 Pearson correlations between health motivation and health beliefs**

	<i>Motivation</i>
Susceptibility	
Age 18–29	0.06
Age 30+	–0.30
Total sample	–0.012
Severity	
Age 18–29	0.15
Age 30+	–0.26
Total sample	0.03
Benefits	
Age 18–29	0.33*
Age 30+	–0.14
Total sample	0.25*
Barriers	
Age 18–29	–0.04
Age 30+	0.06
Total sample	–0.10

\* $P < 0.01$ .

#### Feelings about the test process and their effect on compliance with the test

Subjects' feelings about the test process were examined in three questions on feelings of discomfort, fear and embarrassment. The findings indicate that women who are apprehensive of the test are less inclined to be tested and to intend to be tested. In addition, women who perceive the test as more embarrassing are less compliant; in contrast, feelings of discomfort had no effect.

#### Discussion

The total rate of compliance with Pap tests among the research population was 22.2%. This rate is particularly low in comparison with that depicted in the literature from around the world (Klug et al. 2005; Park et al. 2005; Rossi et al. 2006) (where the lowest rate reported was 34%) and in comparison with literature on lesbian women in particular (where the lowest rate reported was 71%), but similar to the rate indicated in Israeli literature (where a compliance rate of 23% was reported) (The National Center for Disease Control, Ministry of Health 2004). The rate of compliance found in the present study is indeed incompatible with the rate mentioned in the literature, but it is supported by the findings of previous studies, which found that lesbian women consume less health services, postpone testing (Carroll 1999) and consume less preventive medical services (Diamant et al. 2000). Another more specific claim voiced in the literature is that lesbian women undergo fewer Pap tests than heterosexual women (Bailey et al. 2000; Marrazzo 2004; Marrazzo et al. 2000). This is explained by the nature of the population, such as their unfamiliarity with the significance of preventive periodic screening (Diamant et al. 2000), and their belief that they are less susceptible to cervical cancer, even if they previously engaged in heterosexual relations (Marrazzo et al. 2000; O'Hanlan & Crum 1996; Price et al. 1996), in addition to the medical staff's unawareness of the unique medical needs of lesbian women (Carroll 1999). Marrazzo et al. (2000) suggested that lesbian women who are not sexually active with men do not see gynecologists in order to obtain contraceptives, and this significantly reduces their chance of being offered a Pap test by a gynecologist. They also have a lower pregnancy rate, further reducing their gynecological visits (Marrazzo 2004).

Women's compliance with Pap tests was examined in accordance with their age groups as well. Differences were found between the compliance rates of the various age groups both regarding actual testing and regarding intent to be tested, with older women (above 30) undergoing testing three times more often than younger women (aged 18–29) and expressing an intention to be tested almost twice as much than younger women. Here, too, compliance rates are very low compared with the worldwide literature (Diamant et al. 2000; Klug et al. 2005;

Marrazzo 2004; Nguyen et al. 2002) and national literature (The National Center for Disease Control, Ministry of Health 2004), but compatible with many studies which maintain that compliance rates rise with age (Diamant et al. 2000; Kelaher et al. 1999; Leeuwen et al. 2005; Marrazzo 2004; Matthews et al. 2004). In contrast, other studies found high rates of compliance among younger women (Nguyen et al. 2002; Paskett et al. 1999). However, the age groups in each of these studies were divided differently, both in age and age ranges, making it difficult to perform comparisons and even forming bias. The present finding may be explained by the fact that medical personnel tend to recommend screening for early identification of cancer, including Pap tests, to older women more than younger women (Matthews et al. 2004). As lesbian women delay their first pregnancy until after the age of 30 (Ravinson et al. 2005), we can assume that here as well the reason that younger women undergo fewer Pap tests is that they reach the gynecologist at a relatively older age.

The study found that compliant women differ from avoiders by perceiving higher benefits and lower barriers. The benefits variable contributed more than barriers to differences between compliers and avoiders. The contribution of these variables is important but insufficient. It seems that one of the reasons that the model was found to only partially explain the behaviour of women in regard to cervical cancer is the basic premises of the model, which are mainly economical–rational. According to the model, an individual's decision to behave in a certain way is guided by cost–benefit considerations, while the effect of emotional factors on shaping individual behaviour was considered minimal. Indeed, when the health beliefs of women in regard to cervical cancer were examined, they matched the ideal design which serves as the basis of the model's premises. However, when their actual compliance with the test was examined in relation to these beliefs, it was not guided by the rational considerations predicted by the model. This is because of the interference of barriers which prevented them from actually being tested.

Forss et al. (2001) found that benefits are one of the two strongest predictors, and the test is perceived by women who consent to be tested as a means of achieving control, rather than as a way of caring for themselves. It is notable that according to the HBM, the benefits component is comprised of the test's efficiency and its early identification of cervical cancer rather than its potential psychological benefits. The present study examined psychological benefits as well, and in general the benefits in this study were perceived as being high. Gillam (1991) found that women who comply with the test tend to have greater trust in the test's capacity to expose the disease before the appearance of symptoms and in the efficiency of early diagnosis. Park et al. (2005) found that it is possible to enhance

health behaviour by improving its perceived benefits and that in the case of high-perceived benefits of a previously applied action, the result will be its continued application.

The women in this study have a low level of barriers to performing Pap tests; however, these barriers were found to lead to their avoidance of the test. This finding is similar to that of Gillam (1991), who found perceived barriers to be the strongest predictor. Among the barriers perceived, discomfort, embarrassment and pain in regard to the test were found to have the greatest effect on non-compliance. This finding is similar to those of the present study. Rossi et al. (2006) also found barriers to be a strong predictor, as did Austin et al. (2002) who identified barriers as an important variable.

Women who expressed an intention to be tested over the next year perceive their susceptibility to the disease as high, the benefits of the test as high and their general health motivation is high. Here, too, benefits contribute the most to the distinction between those who intend and those who do not intend to be tested over the next year. This is followed by perceived susceptibility and, finally, general health motivation. The total of all beliefs contributes about 22% to predicting women's intention to comply with the test. The reason that the model succeeds in predicting a greater intention may be related to the fact that rationality has more of an effect on intention. Intention is closer to beliefs than actual behaviour and thus it is affected by perceived susceptibility, perceived benefits and general health motivation, and not by emotional factors such as barriers and severity of the disease. A review of studies on cervical cancer according to the HBM found very few studies on women's intention to perform Pap tests in the future, as the model basically relates to actual behaviours and therefore there is not much basis for comparison.

Comparable to the present study, Park et al. (2005) found that medium to high perceived benefits affect intentions to be tested. In contrast, interestingly, the present study found that women who do not intend to be tested perceive the severity of the disease as slightly higher, a finding that is not compatible with the model. A possible explanation is that perhaps women who perceive the severity of the disease as higher utilize defence mechanisms of denial and repression and disregard the risks of the disease – and therefore also have less intention of being tested.

The results indicated that the higher the perceived benefits, the higher the health motivation, but only a moderate correlation was found. Maybe general health motivation as examined in this study expresses health behaviours and habits more than the abstract aspect of motivation, and therefore the correlation found was moderate–low. In addition, health motivation per se is an abstract concept, hard to define (Gillam 1991) and therefore it also does not easily lend itself to empirical examination. None-

theless, it is possible that motivation acts as a mediating variable affected by all beliefs, however only slightly, to a degree not expressed by calculated results. In addition, there are possibly additional factors not included in the model that also affect health motivation.

### Research limitations

Possible biases affecting rates of performing Pap tests may have resulted from the method used, in which data about testing were gathered from the women themselves and not from a qualified medical authority, a fact that some researchers have indicated as leading to incorrect assessments. In addition, maybe women who were tested did not know that the name of the test was 'Pap' or 'screening for cervical cancer', as defined in the questionnaire. Another possible bias is the use of a convenience sample, in which not everyone approached, agreed to participate, and thus it seems that the research population is not representative.

It was difficult to find subjects from all age ranges, particularly from the slightly older age group, and therefore ages were clustered in two broad groups. As a result, precise comparisons with the age ranges mentioned in the literature were not feasible.

### Clinical implications

Research findings indicate the effect of emotional barriers in hindering desirable behaviour – compliance with Pap tests – and the benefits that encourage such behaviour. Thus, the derived recommendations are nursing interventions for reducing emotional barriers and increasing perceived benefits of the test.

According to the findings, it seems that there is room to intervene and change women's perceived susceptibility to the disease. As stated, women's scores on questions regarding familiarity with risk factors for the disease and recommended testing were very low – therefore, there is room to improve knowledge in this field. This goal may be achieved by information pamphlets, advertising in the media, the Internet and on billboards. In addition, beliefs concerning women's perceived susceptibility were one of the variables which discerned women who intended to be tested from those who did not intend to be tested – indicating that these beliefs have an effect on women's health care intentions. In addition, what Weinstein called 'the optimistic biases about personal risk', where women perceive their personal susceptibility to be lower than that indicated by the statistics, requires health personnel (nurses), to occasionally remind them that this is an illusion and that the reality is different.

An information pamphlet mailed to women at home can achieve these and other goals. This is a way of increasing women's familiarity with the test and enriching their knowledge where it has been found to be lacking. This will also reduce their anxiety towards the disease and the test process, as well as

increasing the test's perceived benefits. Information pamphlets can also serve as an incentive; an instrument stimulating women and serving as a 'cue for action'. In order to further arouse women's interest in being tested, pamphlets should be accompanied by notices of pre-arranged appointments. Previous studies have shown that these two methods (mailed information pamphlets and pre-arranged appointments) increase compliance.

Training health teams and preparing them for encounters with patients should also be emphasized, as unpleasant staff–patient encounters will prevent clients from returning in the future, particularly when dealing with sensitive populations such as lesbians. This may be achieved by holding nurse-led workshops for health care staff on effective and sensitive communication with lesbians.

In addition, there is room to improve physicians' awareness of the significance of the test for lesbians. Health care staff's familiarity with lesbian barriers to screening must also be improved. In addition, the inclusion of more women on health care teams must be considered, as studies have proven that feelings of embarrassment and unpleasantness, which proved prominent in the present study as a basis for avoidance, would be reduced in the presence of female personnel.

### Conclusion

The low rate of Israeli lesbian compliance with Pap testing is a major health concern for public nurses in Israel. The study's findings can guide future research and raise possibilities for specific nursing intervention strategies to reduce health disparities among lesbian women in Israel.

### Author contributions

Both authors contributed to the study conception and design, data collection and analysis, drafting of the manuscript, critical revisions for important intellectual content, statistical expertise, as well as administrative, technical and material support.

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## Supporting information

Additional Supporting Information may be found in the online version of this article:

**Table S1** Demographic characteristics: age, religion, origin, marital status and country of birth

**Table S2** Sources of information about the Pap test\*

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