Are women with psychosis receiving adequate cervical cancer screening?

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ABSTRACT

OBJECTIVE To investigate the rates of cervical cancer screening among female patients with psychosis compared with similar patients without psychosis, as an indicator of the quality of primary preventive health care.

DESIGN A retrospective cohort study using medical records between November 1, 2004, and November 1, 2007.

SETTING Two urban family medicine clinics associated with an academic hospital in Toronto, Ont.

PARTICIPANTS A random sample of female patients with and without psychosis between the ages of 20 and 69 years.

MAIN OUTCOME MEASURES Number of Papanicolaou tests in a 3-year period.

RESULTS Charts for 51 female patients with psychosis and 118 female patients without psychosis were reviewed. Of those women with psychosis, 62.7% were diagnosed with schizophrenia, 19.6% with bipolar disorder, 17.6% with schizoaffective disorder, and 29.4% with other psychotic disorders. Women in both groups were similar in age, rate of comorbidities, and number of full physical examinations. Women with psychosis were significantly more likely to smoke ($P<.0001$), to have more primary care appointments ($P=.035$), and to miss appointments ($P=.0002$) than women without psychosis. After adjustment for age, other psychiatric illnesses, number of physical examinations, number of missed appointments, and having a gynecologist, women with psychosis were significantly less likely to have had a Pap test in the previous 3 years compared with women without psychosis (47.1% vs 73.7%, respectively; odds ratio 0.19, 95% confidence interval 0.06 to 0.58).

CONCLUSION Women with psychosis are more than 5 times less likely to receive adequate Pap screening compared with the general population despite their increased rates of smoking and increased number of primary care visits.

EDITOR'S KEY POINTS

- The goal of this study was to assess the quality of primary care for women with severe mental illness; this was achieved through comparing rates of Papanicolaou screening among women with psychosis with the rates among women without psychosis. These female patients were from 2 urban family practice clinics affiliated with a teaching hospital serving an inner-city population in Toronto.
- Women with psychosis are less likely to receive adequate Pap screening.
- This study shows an important disparity in the provision of cervical cancer screening between women with and without psychosis. Further action is needed to increase cervical cancer screening among women who are diagnosed with mental illnesses.

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Les femmes souffrant de psychose ont-elles un dépistage adéquat du cancer du col?

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RÉSUMÉ

OBJECTIF Déterminer le taux de dépistage du cancer du col chez les femmes souffrant de psychose par rapport à des patientes semblables sans psychose, comme indice de la qualité des soins de santé préventifs primaires.

TYPE D'ÉTUDE Étude de cohorte rétrospective à l'aide de dossiers médicaux, entre le 1er novembre 2004 et le 1er novembre 2007.

CONTEXTE Deux cliniques de médecine familiale urbaines affiliées à un hôpital universitaire de Toronto, Ont.

PARTICIPANTS Un échantillon aléatoire de patientes de 20 à 69 ans avec ou sans psychose.

PRINCIPAUX PARAMÈTRES MESURÉS Nombre de tests de Papanicolaou effectués sur 3 ans.

RÉSULTATS On a révisé les dossiers de 51 patientes avec psychose et de 118 sans psychose. Parmi celles avec psychose, 62,7% souffraient de schizophrénie, 19,6% de maladie bipolaire, 17,6% de trouble schizoaffectif et 29,4% d'un autre type de problème psychotique. Les âges, taux de comorbidité et nombre d'examens physiques complets étaient semblables dans les 2 groupes. Par rapport aux femmes sans psychose, celles avec psychose étaient significativement plus susceptibles de fumer ($P<,0001$), d'avoir plus de rendez-vous pour des soins primaires ($P=,035$) et de manquer leurs rendez-vous (($P=,0002$). Après ajustement pour l'âge, les autres maladies psychiatriques, le nombre d'examens physiques, le nombre de rendez-vous manqués et le fait d'avoir un gynécologue, les femmes souffrant de psychose étaient significativement moins susceptibles que celles sans psychose d'avoir eu un test de Papanicolaou au cours des 3 années précédentes (47,1% vs 73,7%, respectivement; rapport de cotes 0,19, intervalle de confiance à 95% 0,06 à 0,58).

CONCLUSION Les femmes souffrant de psychose ont un risque plus de 5 fois plus élevé que la population générale de ne pas avoir un dépistage adéquat par le Pap test, malgré un plus fort taux de tabagisme et un nombre plus élevé de visites pour soins primaires.

POINTS DE REPÈRE DU RÉDACTEUR

- Cette étude voulait évaluer la qualité des soins primaires chez les femmes atteintes de maladies mentales sévères; à cette fin, on a comparé le taux des tests de Papanicolaou chez les femmes souffrant de psychose à celui de femmes sans psychose. Les patientes provenaient de 2 cliniques urbaines de médecine familiale affiliées à un hôpital d'enseignement desservant un quartier déshérité de Toronto.
- Les patientes souffrant de psychose sont moins susceptibles d'avoir un dépistage adéquat par le test de Papanicolaou.
- Cette étude montre que le taux de dépistage du cancer du col est très différent entre les femmes qui ont une psychose et celles qui n'en ont pas. Des interventions seront nécessaires pour augmenter le taux de dépistage du cancer du col chez les femmes souffrant de maladies mentales.

Cet article a fait l'objet d'une révision par des pairs.
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Cervical cancer was once the leading cause of cancer death for women. However, mortality and morbidity of this disease have decreased substantially since the advent of widespread screening using Papanicolaou tests.[1] In Canada, age-standardized mortality rates from invasive cervical cancer decreased from 7.4 per 100 000 in 1969 to 2.4 per 100 000 in 1992. Cervical cancer incidence rates also decreased from 21.6 per 100 000 in 1969 to 10.4 per 100 000 in 1990.[2] From 1992 to 2001, there were further reductions in both incidence and mortality.[3]

The greatest risk factor for developing cervical cancer is infection with a high-risk human papillomavirus (HPV) type.[1] Another considerable risk factor is never having been screened or being underscreened.[3] Factors such as smoking, low socioeconomic status, higher number of sexual partners, younger age at first sexual intercourse, and unsafe sexual behaviour of the woman's male partners also increase risk.[4]

Women with schizophrenia and psychosis might be at particularly high risk of cervical cancer: People with mental illnesses tend to be of lower socioeconomic status; 85% of people with schizophrenia smoke compared with 23% of the general population[5]; and people with schizophrenia have been found to have excess mortality compared with the general population, owing to differences in access to and use of health care services,[6] as well as to decreased quality of treatment received within the health care system.[5] Furthermore, women with schizophrenia and psychosis have a high lifetime incidence of sexual abuse (69%),[7] which could confer a greater risk of cervical cancer owing to forced sexual activity. Women with mental illness have also been reported to have had more sexual partners in their lifetime than age- and race-matched controls.[8]

Results of a handful of US studies in this area have been inconsistent. One study examined the self-reported use of gynecological services including Pap screening and mammograms in older women with schizophrenia compared with women without schizophrenia. Women with schizophrenia reported significantly lower rates of Pap screening and mammography compared with controls (71% vs 96% for Pap screening, $P=.001$; 68% vs 98% for mammography, $P<.001$).[9] Another study, which assessed Pap screening and other preventive care measures also through self-reporting among women with schizophrenia and schizoaffective disorder, found a very high overall rate of Pap screening with no difference between groups.[10] However, both studies were limited by relying on self-reported data, convenience sampling, and a lack of age comparability between groups.

To our knowledge, no Canadian study has assessed whether women with schizophrenia and psychosis receive adequate screening for cervical cancer compared with women without psychosis. As Pap tests are an integral part of preventive medicine, rates are likely to correlate with the general level of primary care that these women receive. The aim of this study was to investigate the quality of primary health care received by women with psychotic conditions at urban primary care centres compared with their counterparts by measuring adequacy of cervical cancer screening using retrospective chart review. Adequacy of cervical cancer screening was defined as having at least 1 Pap test in a 3-year time period.

METHODS

We conducted a retrospective cohort study using medical records at 2 urban family medicine clinics associated with St Michael's Hospital, a large teaching hospital that services the inner-city population of Toronto, Ont. All eligible women with psychosis (ie, cases) were identified using Ontario Health Insurance Plan physician billing codes for clinic visits, occurring between November 2006 and November 2007, associated with diagnoses of schizophrenia, bipolar disorder, schizoaffective disorder, or psychosis not yet determined. A random sample of women without any billing codes for psychosis (ie, noncases) were frequency-matched to cases according to 5-year age strata using a 2-to-1 ratio. The case or noncase status of each patient was confirmed through a diagnosis, or lack thereof, of a psychotic disorder (ie, schizophrenia, bipolar disorder, schizoaffective disorder, or psychosis not yet determined) documented on the chart. Inclusion criteria for all subjects were the following: women aged 20 to 69 years, at least 1 visit to the clinic between November 2006 and November 2007, and being a patient at the clinic for at least 4 years (determined by record of at least 3 visits between November 1, 2004, and November 1, 2007). Exclusion criteria consisted of record of hysterectomy at any time or a history of abnormal Pap test results prior to November 1, 2004.

The number of Pap tests performed between November 1, 2004, and November 1, 2007, was recorded, as well as where the Pap tests were performed (at the family medicine clinics vs another location) and who performed them (family physician vs gynecologist). The following information was also recorded during the study period: age; any psychiatric diagnosis; use of antipsychotic or mood-stabilizing drugs; comorbidities; smoking status; and number of clinical visits, missed appointments, and full physicals. One researcher (D.T.) reviewed all charts.

The traditional $P<.05$ level was used for all significance testing. Data analyses included descriptive statistics as well as unconditional logistic regression to identify independent determinants of cervical cancer screening. Variables that could be associated with cervical cancer screening and that would be available on chart review were determined by a priori judgment. For inclusion in the final multivariable model, variables were selected

using a backward selection procedure with a liberal *P* value of .30 and confirmed using a forward selection procedure. All statistical analyses were performed using SAS, version 9.1. Ethics approval was received from the Research Ethics Board at St Michael's Hospital.

RESULTS

There were 228 charts (ie, 69 female patients with psychosis and 159 female patients without psychosis) initially identified; of these, 59 charts were excluded (**Figure 1**). The final sample consisted of 51 female patients with psychotic conditions (ie, cases) and 118 female patients without such conditions (ie, noncases). Most of the women in the cases group (62.7%) had a diagnosis of schizophrenia (**Table 1**). Women in both groups were similar in terms of age, rates of comorbid medical illness and comorbid nonpsychotic psychiatric illness, and addictions to cocaine and opioids. Despite incomplete information in medical records on smoking status, the women in the cases group were significantly more likely to smoke than the women in the noncases group (51.0% of cases vs 20.3% of noncases, $P<.0001$).

Table 2 shows descriptive characteristics of the number of Pap tests completed and other clinical visit variables by case and noncase status. Women with psychosis had fewer Pap tests compared with women without psychotic conditions, with 47.1% versus 73.7% having had at least 1 Pap test in the 3-year study period, respectively. Of the 58 charts without recorded Pap tests, 6 of them had reasons noted (ie, "declines," "refuses," "deferred," "not necessary," or "will do at gynecology clinic and send result"). Women with case and noncase status had a similar number of full physical examinations, with 33.3% versus 36.4% having had at least 1 full physical examination, respectively. Differences were seen in terms of the total number of clinical visits and number of missed appointments during the study period. Although more women with noncase status had gynecologists, more than 80% of Pap tests were completed by family physicians among women in both groups.

Table 3 presents results of multivariable logistic regression modeling. After adjustment for age, other psychiatric illnesses, number of physical examinations, number of missed appointments, and having a gynecologist, women with psychosis were significantly less likely to have had adequate screening compared with women without psychosis (odds ratio 0.19, 95% confidence interval 0.06 to 0.58). Younger age ($P=.04$), having a gynecologist ($P=.03$), and a higher number of full physical examinations ($P<.0001$) were also significantly associated with adequate cervical cancer screening in the final model.

DISCUSSION

The primary aim of this study was to assess the quality of primary care for women with severe, persistent mental illness. This was achieved through comparing rates of Pap screening among women with chronic psychotic illnesses with the rates among women without

Figure 1. Exclusion of ineligible charts from the 228 initially identified: *Patients with psychosis (ie, cases) and patients without psychosis (ie, noncases).*

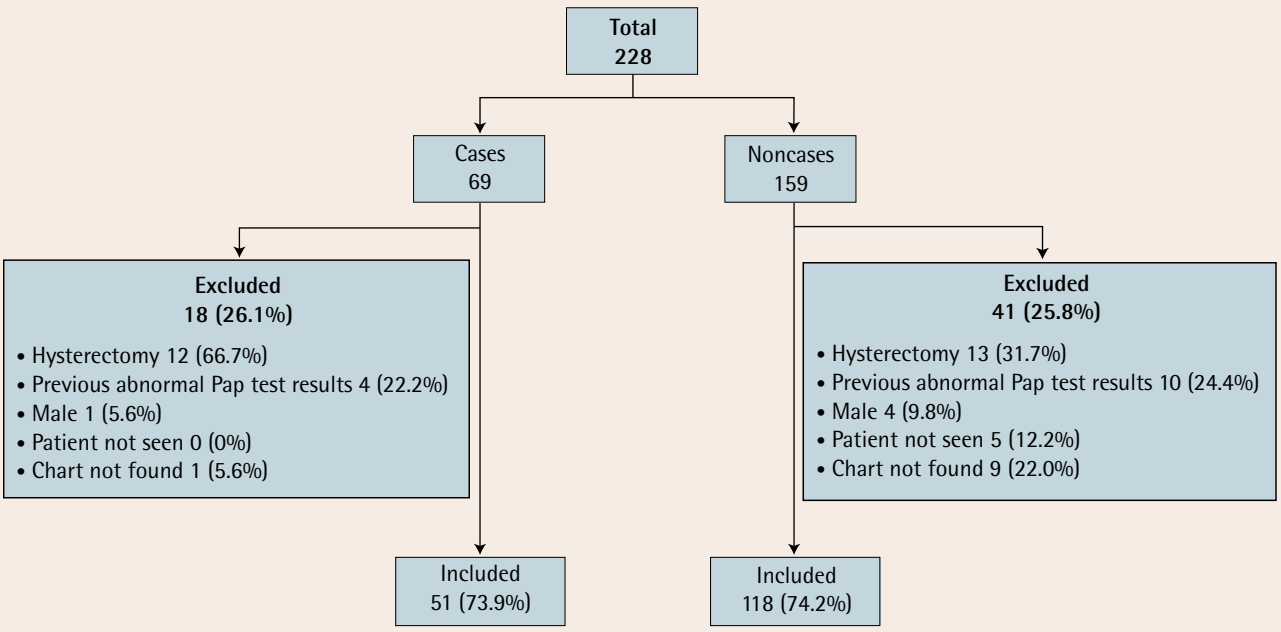

Table 1. Patient characteristics: *Mean (SD) age was 47.8 (9.7) years for women with psychosis (ie, cases) and 47.0 (11.0) years for women without psychosis (ie, noncases) (P = .067).*

VARIABLES	CASES (N = 51) N (%)	NONCASES (N = 118) N (%)	*P* VALUE*
Psychotic condition			
• Schizophrenia	32 (62.7)	0	
• Other psychotic disorder	15 (29.4)	0	
• Bipolar disorder	10 (19.6)	0	
• Schizoaffective disorder	9 (17.6)	0	
Other psychiatric comorbidity†	15 (29.4)	35 (29.7)	.97
Chronic comorbidity‡	31 (60.8)	78 (66.1)	.51
Opioid or cocaine addiction	3 (5.9)	5 (4.2)	.70
Smoking history			
• Current smoker	26 (51.0)	24 (20.3)	< .0001
• Not recorded	9 (17.6)	26 (22.0)	

NA—not applicable.
**P* value for student *t* test, Pearson χ^2 test, or Fisher exact test comparing cases and noncases.
†Other nonpsychotic psychiatric comorbidities included the following: attention deficit hyperactivity disorder, anxiety, depression, eating disorder, mental retardation, obsessive compulsive disorder, panic disorder, personality disorder, and posttraumatic stress disorder.
‡Chronic comorbidities included the following: anemia, asthma, coronary artery disease, cancer, celiac disease, cholecystitis, chronic pain, chronic renal failure, Crohn disease, chronic obstructive pulmonary disease, cerebrovascular disease, diabetes, endometriosis, fibromyalgia, hepatitis C, HIV or AIDS, hypercholesteremia, hypertension, mitral valve prolapse, osteoarthritis, osteoporosis, pancreatitis, polycystic ovary syndrome, rheumatoid arthritis, seizure disorder, tardive dyskinesia, and thyroid disease.

Table 2. Characteristics of Papanicolaou tests and clinical visits of women with psychosis (ie, cases) and women without psychosis (ie, noncases)

CHARACTERISTICS	CASES (N = 51), N (%)	NONCASES (N = 118), N (%)	*P* VALUE*
No. of Pap tests			.008
• 0	27 (52.9)	31 (26.3)	
• 1	14 (27.5)	47 (39.8)	
• 2	8 (15.7)	27 (22.9)	
• ≥ 3	2 (3.9)	13 (11.0)	
Pap test collected by†			.903
• family physician	20 (83.3)	74 (86.0)	
• gynecologist	2 (10.0)	7 (8.1)	
• both	2 (10.0)	5 (5.8)	
Has a gynecologist	4 (7.8)	23 (19.5)	.058
No. of full physical examinations			.198
• 0	25 (49.0)	42 (35.6)	
• 1	17 (33.3)	43 (36.4)	
• ≥ 2	9 (17.6)	33 (28.0)	
No. of clinical visits			.035
• 1-9	6 (11.8)	32 (27.1)	
• 10-14	13 (25.5)	35 (29.7)	
• ≥ 15	32 (62.7)	51 (43.2)	
No. of missed appointments			.0002
• 0	13 (25.5)	62 (52.5)	
• 1-2	15 (29.4)	36 (30.5)	
• ≥ 3	23 (45.1)	20 (16.9)	

**P* value for Pearson χ^2 test comparing cases and noncases.
†In this category, n = 24 for the cases group; n = 86 for the noncases group.

Table 3. Variables associated with having at least 1 Papanicolaou test: *Reported associations are adjusted for all other variables listed in the table.*

VARIABLE	OR (95% CI)	*P* VALUE
Psychosis case	0.19 (0.06-0.58)	< .001
Age	0.95 (0.91-1.00)	.04
Other psychiatric illness	0.53 (0.18-1.56)	.25
Has gynecologist	4.99 (1.22-20.46)	.03
No. of full physical examinations	27.38 (9.54-78.54)	< .0001
No. of missed appointments		
• 0 (referent)	1.00	
• 1-2	2.52 (0.73-8.76)	.64
• ≥ 3	3.67 (1.09-2.37)	.14

CI—confidence interval, OR—odds ratio.

such diagnoses at 2 primary care clinics that serve a large inner-city population in Toronto. We found that the screening rate for women without psychosis in this study (73.7%) was similar to a previously reported rate of 70.3% for Toronto.[11] Women with psychotic illnesses had a screening rate of 47.1%, and thus substantially lower odds of receiving appropriate cervical cancer screening (81% or 5.3 times lower odds). This finding is in keeping with previous research showing that people with schizophrenia are less likely to receive adequate primary health care.[3] Previous studies relying on self-reported data among older women with and without psychosis in the United States have reported mixed results on rates of cervical cancer screening.[9,10] To our knowledge, no previous study in Canada has examined Pap screening in this population.

In this study, the women in the 2 groups were similar in key respects, including age, rates of comorbid medical illness, nonpsychotic psychiatric illness, substance abuse, and total number of full physical examinations. There was a significant difference in smoking rates between cases and noncases (*P* < .0001), in line with previous research indicating that people with schizophrenia are more likely to smoke.[1] Most of the women with case

status used antipsychotics or mood stabilizers; few women with noncase status used these medications. This finding is also expected, as women with psychosis have a clear indication for these medications. The difference in the use of health care services between the 2 groups, specifically both more appointments and missed appointments among the women in the cases group, is not surprising given the burden of illness and disorganization facing women with serious chronic mental illness.

One potential barrier to adequate screening for women with psychosis could be the high time demand for treating acute mental illness, which might supersede screening. Illness-related factors such as delusions and paranoia might adversely affect Pap test rates. Physician-related factors such as fear of being incorporated into a patient's delusions, fear of misunderstanding regarding an invasive procedure, and issues with patient hygiene might also account for some of the disparity in screening rates. Finally, patient-related factors such as understanding of the procedure and its risks and benefits might also be contributors to inadequate screening rates.

Limitations

This study has several limitations. Low screening rates have been associated with race, low income, low education, foreign language, and recent immigration.[3] These potential confounders were not identifiable from medical records. However, the 2 family medicine sites were selected owing to their urban inner-city populations with high rates of patients with low socioeconomic status, recent immigration, and homelessness. Therefore, it might be reasonable to assume that these factors were similarly prevalent among both groups of women. Furthermore, the 2 clinics studied are closely connected and associated with the same large academic centre dedicated to providing inner-city care. The results might not be generalizable to family medicine clinics in other urban or rural settings or to clinics not specializing in inner-city primary care. Finally, because of the small number of women with psychosis, we were unable to conduct analyses stratified by psychotic condition.

Nonetheless, our finding that women with psychosis are being significantly underscreened for cervical cancer is an important one. Women with psychosis might be at greater risk of invasive cervical cancer owing to higher rates of smoking,[1] lifetime incidence of sexual assault,[2] and risky sexual behaviour associated with manic episodes; therefore, screening might be even more important in this group than in the general population.

Further directions for research would involve confirming these findings in other primary care settings. Collecting information on potential confounders such as race, immigration, income, and education would prove valuable. It might also be useful to compare rates of cervical cancer screening among women with psychotic illnesses with those among women with chronic medical illnesses (eg, diabetes) to determine whether a chronic illness in general lowers screening rates rather than psychotic illness specifically.

Conclusion

This study adds to a limited body of research that examines patterns of use of primary care services among persons with severe mental illness and shows a serious disparity in the provision of cervical cancer screening to women with and without psychosis. In our setting, women with psychosis, who are likely at higher risk of cervical cancer, were 81% less likely to have adequate Pap screening compared with their otherwise similar counterparts. Considering that this study took place in a setting that specifically aims to provide primary care to people with severe mental illness, it is possible that other clinical settings might have even lower rates of cervical cancer screening for this population. Based on the unacceptably low rate of cervical cancer screening, one might infer that women with psychosis are receiving inadequate primary health care overall. Further action needs to be taken to increase cervical cancer screening in this population and to determine whether other primary health care measures are adequately provided to people with psychosis.

Dr Tilbrook was a locum physician in the Department of Family and Community Medicine at St Michael's Hospital in Toronto, Ont, at the time of writing this paper. She is currently on locum in New Zealand. **Ms Polsky** is a research associate and **Dr Lofters** is a physician, both in the Department of Family and Community Medicine at St Michael's Hospital.

Contributors

Dr Tilbrook is the principal investigator for this study. She contributed to concept and design, all data abstraction, and data interpretation. She drafted the original manuscript and contributed to its revision and editing. **Ms Polsky** contributed to the research concept and design. She performed the regression analysis and contributed to manuscript revision. **Dr Lofters** was involved in the concept and design of the study. She made substantial contributions to data analysis and manuscript revision. All authors approved the final version of the manuscript.

Competing interests

None declared

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References

1. Kasper D, Braunwald E, Hauser S, Longo D, Jameson L, Fauci A. *Harrison's principles of internal medicine.* 16th ed. Toronto, ON: McGraw Hill; 2005.
2. Quality Management Working Group Cervical Cancer Prevention Network. *Programmatic guidelines for screening for cancer of the cervix in Canada*. Ottawa, ON: Society of Gynecologic Oncologists of Canada; 1998. Available from: **www.phac-aspc.gc.ca/cd-mc/pdf/screening.pdf**. Accessed 2010 Feb 17.
3. Lofters A, Glazier RH, Agha MM, Creatore MI, Moineddin R. Inadequacy of cervical cancer screening among urban recent immigrants: a population-based study of physician and laboratory claims in Toronto, Canada. *Prev Med* 2007;44(6):536-42.
4. Franco EL, Duarte-Franco E, Ferenczy A. Cervical cancer: epidemiology, prevention and the role of human papillomavirus infection. *CMAJ* 2001;164(7):1017-25.
5. Goff DC, Cather C, Evins AE, Henderson DC, Freudenreich O, Copeland P, et al. Medical morbidity and mortality in schizophrenia: guidelines for psychiatrists. *J Clin Psychiatry* 2005;66(2):183-94; quiz 147, 273-4.
6. Roberts L, Roalfe A, Wilson S, Lester H. Physical health care of patients with schizophrenia in primary care: a comparative study. *Fam Pract* 2007;24(1):34-40. Epub 2006 Oct 24.
7. Rice E. Schizophrenia and violence; the perspective of women. *Issues Ment Health Nurs* 2006;27(9):961-83.
8. Dickerson FB, Brown CH, Kreyenbuhl J, Goldberg RW, Fang LJ, Dixon LB. Sexual and reproductive behaviours persons with mental illness. *Psychiatr Serv* 2004;55(11):1299-301.
9. Lindamer LA, Buse DC, Auslander L, Unützer U, Bartels SJ, Jeste DV. A comparison of gynecological variables and service use among older women with and without schizophrenia. *Psychiatr Serv* 2003;54(6):902-4.
10. Dickerson FB, Pater A, Origoni AE. Health behaviors and health status of older women with schizophrenia. *Psychiatr Serv* 2002;53(7):882-4.
11. Cancer Care Ontario [website]. *Toronto central LHIN*. Toronto, ON: Cancer Care Ontario; 2009. Available from: **http://csqi.cancercare.on.ca/cms/One.aspx?portalId=40955&pageId=41309.** Accessed 2010 Mar 9.