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Complementary and Alternative Medicine in Psychotic Disorders

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Abstract

The use of complementary and alternative medicine (CAM), including alternative therapies (ALT) and natural health products (NHP) such as vitamin and herbal supplements, is increasingly accepted in both the general population as well as in patients with mood and anxiety disorders. The level of acceptance and use of CAM, however, is unknown among patients being treated for psychotic disorders. Psychotic patients were surveyed about their use of and attitudes toward CAM. Questions included basic demographic and socio-economic items as well as the lifetime and 12-month use of CAM. Data were collected from June to October 2005. A sample of 172 participants representing 8.4% of the total eligible population of the outpatient clinics within the Schizophrenia Program at the Centre for Addiction and Mental Health in Toronto Canada completed the survey. Considering all forms of CAM, the lifetime and 12-month prevalence rate were 88% and 68%, respectively. The use and perceived safety of CAM by this population is similar to that reported by the general population. Clinical and public health implications of these findings are discussed.

KEYWORDS: schizophrenia, natural health products, herbal remedies, prevalence

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Introduction

Schizophrenia is associated with severe social and cognitive dysfunction (Lewis & Moghaddam, 2006; Stanghellini & Ballerini, 2007). Conventional treatments for schizophrenia including the use of antipsychotic medications (Kapur & Mamo, 2003) may not eliminate all symptoms and have the potential for adverse effects (Stahl & Buckley, 2007). Earlier research has suggested that patients with psychotic disorders may turn to complementary and alternative medicine (CAM), defined as products and practices that are not considered part of conventional medical practice (National Institutes of Health, 2009). Previous studies suggest that CAM is primarily used in addition to conventional therapy (Demling et al., 2002) by individuals seeking to improve their quality of life, (Rickhi et al., 2003) and to restore hope that their distress may be reduced if not eliminated (Murray & Rubel, 1992). However, the clinical benefits of CAM for psychotic symptoms are either unsubstantiated (Ping et al., 1997) or have been refuted (Chen et al., 1997; Rathbone et al., 2005; Zhang & Zhou, ; Zhang et al., 2001).

High prevalence of CAM use has been reported in North Americans and Europeans, with recent trends toward increasing use (Assion et al., 2007; Demling et al., 2002; Druss & Rosenheck, 2000; Eisenberg et al., 1998; Fisher & Ward, 1994; Health Canada, 2005, 2007; Ramsay et al., 1999; Statistic Canada, 2003; Unutzer et al., 2000). For example, the Canadian Community Health Survey in 2003, reported that 20% of Canadians aged 12 or older had visited at least one type of CAM provider such as a chiropractor or naturopathic practitioner (Statistics Canada, 2003). More recently, results from the Natural Health Products Directorate of Health Canada survey (2005) estimated that 71% of Canadians have used natural health products (NHP) at some time in their lives (Health Canada, 2005). These findings are consistent with the results of epidemiological surveys from other countries (Demling et al., 2002; Druss & Rosenheck, 2000; Eisenberg et al., 1998; Fisher & Ward, 1994; Health Canada, 2005; Ramsay et al., 1999; The National Center for Complementary and Alternative Medicine; Unutzer et al., 2000).

The literature suggests that patients suffering from mental health problems may be especially high users of CAM. A recent Canadian study showed that approximately 70% of people attending a complementary therapy clinic reported suffering from a psychiatric condition (anxiety & depression) using DSM-III-R criteria (American Psychiatric Association, 1994; Rickhi et al., 2003). A high prevalence of CAM use by individuals with anxiety and depressive disorders has also been found in national surveys of both American and British populations (Chen et al., 1997; National Institutes of Health, 2007; Ping et al., 1997; Rathbone et al., 2005; Zhang et al., 2001). In a survey of CAM use in psychiatric inpatients in Germany, the number of patients with schizophrenia who reported CAM use

was identical to those with depression (Assion et al., 2007). An analysis of the National Comorbidity Survey-Replication in the United States reported a rate of 31.1 % of unverified CAM use among persons with psychiatric care needs. In Canada, where conventional therapies are paid for by the state, it is not clear if similarly high numbers of patients with primary psychotic disorders will seek CAM therapies for which they must pay directly.

In Canada, NHPs are easily available in community pharmacies and health food stores and are marketed extensively in the media. Although a number of regulatory measures have been instituted to ensure adequate safety standards in the manufacturing and labeling of these products, the extent of patients' awareness of the true effects and safety of these therapeutic modalities is unknown for patients with severe mental illness (Health Canada, 2005). Social and cognitive disability in patients with primary psychotic disorders may increase their vulnerability to advertisements of the purported therapeutic benefits of CAM. Other factors such as gender and underlying belief systems are also likely to contribute to the use of CAM (Chiu et al., 2005). We therefore conducted a survey of ambulatory patients with schizophrenia and related primary psychotic disorders followed at an inner city psychiatric hospital in Toronto to determine the prevalence and attitudes toward the safety and benefits of CAM.

The primary objective of this paper is to report the prevalence (lifetime and 12 months) of diverse CAM modalities including NHP (natural health products) such as herbal medicines excluding vitamins and minerals); ALT (alternate therapies such as yoga or meditation); VIT (vitamins and minerals); and CMP (visits to complementary medicine practitioners) in ambulatory patients with schizophrenia and related primary psychotic disorders followed at an inner city psychiatric hospital in Toronto. We hypothesize that the rate of use in our sample would be lower than the rates of CAM use found in community samples of the general population. The second objective of the paper is to report on our examination of the perceived benefits and safety of the CAM and "conventional medical care" received directly from doctors. We hypothesized that current and past users of CAM would report more perceived benefits and perceive CAM as safer than those who had never used CAM.

Methods

The study was approved by the Research Ethics Board of the Centre for Addiction and Mental Health. This study used an interviewer-assisted paper survey instrument to measure the use of, and attitudes toward, CAM in patients with psychotic disorders. The survey consisted of basic demographic and socio economic items, the lifetime and 12-month use of CAM, including CAM practitioners (CMP) and ALT, VIT and NHP. VIT were assessed as a separate

category from other NHP (such as herbal medicines, essential fatty acids, probiotics and homeopathic medicines) because several vitamins are routinely used by physicians to treat specific medical conditions - thus the use of these vitamins could not be considered CAM. For example, Vitamin E has been used for tardive dyskinesia (Arvindakshan et al., 2003), and vitamin B1 (Lerner et al., 2004) is often administered to prevent Wernicke's encephalopathy in persons experiencing withdrawal from alcohol. In this study, CAM use was defined as consulting a CMP, using ALT, VIT or NHP. A list of each was provided to the respondents along with an opportunity to add additional items in any category. CAM practitioners (CMP) included aboriginal healers, acupuncturists, Ayurvedic/Indian Medicine practitioners, chiropractors, doctors of complementary medicine, herbalist, homeopathic practitioners, and massage therapist. ALT included biofeedback, homeopathy, hypnosis, meditation or relaxation techniques, tai chi, traditional Chinese medicine, and yoga. VIT included vitamin A or beta carotene, vitamin B, vitamin C, vitamin E, calcium, magnesium or multivitamins. Typically NHP encompass a wide range of products such as herbal remedies, vitamins, minerals and other forms of supplementation. In this study however, NHP were limited to those commonly used in psychiatric conditions which were presented in a list to the respondents: chamomile, cod liver oil, echinacea, evening primrose oil, garlic, ginkgo, ginseng, glucosamine, kava kava, palmetto, valerian, and St. John's wort. (Table 2)

The survey instrument was adapted from a survey that was developed and used to assess CAM use among a sample of cancer patients (Boon et al., 2003). Minor modifications were made to this survey to include items that were more applicable to patients being treated for psychotic disorders. The modifications were based on the findings from a qualitative pilot study of schizophrenic outpatients' use of and attitudes towards CAM and NHPs that was conducted in 2004 (Personal communication, Dr. Mamo).

Ambulatory patients enrolled in the schizophrenia program at the Centre for Addiction & Mental Health - CAMH (an inner city hospital affiliated with the University of Toronto) who were considered by the treating team to be clinically stable and able to tolerate a brief survey were eligible to participate in the study. The schizophrenia program at CAMH provides ambulatory care to more than 3000 patients, which is approximately 25 % of patients suffering from primary psychotic disorders in Toronto. Given the tertiary care nature of the Centre, many patients followed by the program would likely have failed routine community-based management. Diagnosis of schizophrenia was not confirmed by the study interviewers and no direct clinical input from the treating psychiatrists was sought as part of the survey. Subjects were either self-referred in response to posted advertisements at the Centre, or referred by their case-workers. In all cases, a trained research assistant facilitated the completion of the survey. For this study,

participants received a token honorarium of \$10 for each hour spent completing the survey.

To determine the perceived benefits and safety of conventional medicine, participants were asked to rate their experiences with “conventional medical treatments” by indicating their perceptions of the “truth” of a set of statements that describe possible benefits and safety issues. Respondents indicated their opinions on a five point scale, ranging from “not at all true” to “very true”. However, due to few responses with extreme choices, responses with “not at all true” and “not very true” were assigned a value of zero, while “fairly true” and “very true” were assigned a value of 2. The neutral (mid-point) category was coded as 1. The scales of perceived benefit and safety of conventional medicine were computed as the sum of the three item scores. The internal consistency (as measured by Cronbach's alpha coefficients) of the three-item scales of perceived benefit and safety were 0.65 and 0.36 respectively. All respondents, irrespective of their previous use of CAM, were asked to rate the same set of statements regarding their experiences with NHPs. Perceived benefits and safety of NHPs were computed following the same operations used to rate the benefits and safety of conventional medicine and the internal consistency of the three item scales of perceived benefit and safety of CAM were 0.73 and 0.56 respectively.

Results

Table 1. Patient demographics (N=172) and prevalence (%).

Demographic Factors			
Sex (%)		Income	
Male	72.7	Annual income	
Female	27.3	<10,000 Cdn \$	61.0 %
Race		>10,000 Cdn \$	39.0 %
Caucasian/European	58.7	Source of Income	
Others	41.3	Ontario Disability Support Program	76.7 %
Country of Birth		Part time Employment	4.1 %
Canada	63.4	Full time Employment	3.5 %
Outside Canada	36.6	Unknown	15.7 %
Marital Status			
Never married /single	85.5		
Unknown	14.5		

Table 1 summarises the demographics of the participants. In total, 172 patients participated in the study (73% were male; mean age ± SD = 41 ± 12.5 years, range = 19-64 years), with a self-reported diagnosis of schizophrenia (82%),

schizoaffective disorder (7.6%), psychosis not otherwise specified (4.1%), bipolar disorder (1.2%), and major depression (0.6%). The duration of illness ranged from less than a year to 25 years. The overrepresentation of male participants is consistent with the 3:1 ratio of males to females in the Schizophrenia Program at the Centre for Addiction and Mental Health. Most respondents (85.5%) were single and had never married, less than half (44.8%) of the participants had attained a high school diploma. 61% of participants were predominantly of lower socioeconomic status earning less than \$10,000 in 2004. A similar trend was found with respect to household income, with 50% of participants reporting annual household incomes of less than \$10,000. Only a small fraction of the sample was employed with either part time (4.1%) or full time (3.5%) employment, and more than three quarters of respondents (76.7%) identified the allowance from the Ontario Disability Support Program (ODSP) as their main source of income. The majority of the respondents were Canadian born (63.4%) and of Caucasian descent. These figures suggest that the representation of immigrants in our sample (36.6%) was lower than the proportion of immigrants in the Greater Toronto Area (45.7%) (Chui et al., 2007), whereas the proportion of visible minority (41.3%) was representative of that in the Greater Toronto Area (42.9%) (Statistic Canada, 2008).

The majority of participants (88.4%) reported using some type of CAM at least once during their lifetime, and 68.0% reported having used CAM during the last 12 months. Only 48% of participants reported disclosing their use of CAM to their psychiatrists or case managers, and only 42% reported their use of CAM to their family physicians.

Table 2 lists the lifetime and past year prevalence of the different CAM dimensions (CMP, ALT, VIT and NHP) in our population. The lifetime prevalence of visiting a CAM practitioner was 40.7%. The most commonly reported practitioners utilized were chiropractors (20.9%), followed by massage therapists (11.6%), and acupuncturists (9.9%). Within the past year, 16.9% of participants visited at least one CAM practitioner.

The lifetime prevalence of ALT use was 52.9%. Meditation/relaxation techniques were the most commonly reported therapies used (39.5%), followed by yoga (23.3%), and tai chi (11.6%). Within the past year, 33.3% of participants reported use of at least one ALT.

The lifetime prevalence of VIT intake was 70.3%. The most commonly used vitamin supplement was the multivitamin (54.1%), followed by vitamin C (32.0%) and calcium supplements (22.1%), vitamin E (15.7%), and vitamin B (14.5%). Within the past year, 48.3% of participants used at least one vitamin and mineral supplement.

Table 2. Lifetime and past year prevalence of complementary and alternative medicine (CAM) dimensions.

CAM Dimensions		Lifetime Prevalence (%)	Past Year Prevalence (%)
CAM Practitioners	Acupuncturist/Traditional Chinese	9.9	3.9
	Ayurvedic/Indian Medicine	1.2	0.7
	Aboriginal Healer	4.7	2.8
	Chiropractor	20.9	8.7
	Doctor of Complementary Medicine	4.7	2.9
	Herbalist	5.8	3.5
	Homeopathic practitioner	4.1	3.4
	Massage Therapist	11.6	4.7
	Naturopathic practitioner	4.7	3.5
	Reflexologist	2.9	1.7
	Reiki Healer	4.1	1.7
	Therapeutic-touch practitioners	2.3	0.6
	Alternative Therapies	Biofeedback	2.3
Homeopathy		4.7	3.5
Hypnosis		5.8	0.6
Meditation or relaxation techniques		39.5	25
Tai Chi		11.6	4.1
Traditional Chinese Medicine		3.5	2.9
Vitamin and Mineral Supplements	Yoga	23.3	11.6
	Vitamin A or Beta carotene	8.7	7.5
	Vitamin B*	14.5	8.9
	Vitamin C	32.0	20.3
	Vitamin E*	15.7	11.0
	Calcium	22.1	18.0
	Magnesium	9.3	8.3
Other NHPs	Multi-vitamin	54.1	36.0
	Chamomile	34.3	16.9
	Cod Liver Oil	30.8	5.2
	Echinacea	16.9	9.3
	Evening Primrose Oil	5.2	2.3
	Garlic	15.7	8.7
	Ginkgo*	7.6	3.5
	Ginseng	27.3	11.0
	Glucosamine Sulphate	5.2	3.5
	Kava Kava	1.2	0.0
	M. Valerian	4.7	1.2
	St. John's Wort*	8.7	1.7
Saw Palmetto	1.7	0.6	

* Vitamins and supplements and NHPs that have been reported to be used in the treatment of psychiatric disorders.

The lifetime use of NHPs was 62.8%. The most commonly used NHPs were: chamomile (34.3%), cod liver oil (30.8%), ginseng (27.3%), echinacea (16.9%), and garlic (15.7%). Within the past year, 36% of participants reportedly used at least one NHP.

Table 3. Comparison of users and non-users of Natural Health Products (NHP), alternative therapies (ALT), vitamin and mineral supplement products (VIT), complementary and alternative medicine practitioners (CMP) users on perceived benefits and safety of NHP and conventional medicines.

			BENEFIT		SAFETY	
			Benefit of CAM	Benefit of Conventional Medicine	Safety of CAM	Safety of Conventional Medicine
NHP	Lifetime	User	4.87 (1.44)	4.15 (1.91)	4.43 (1.40)	1.25 (1.28)
		Non- user	3.86 (1.75)	4.34 (1.69)	2.09 (1.18)	1.86 (1.22)
		P value	<0.001	0.499	<0.001	0.002
	Past 12 month Use	User	5.35 (1.03)	4.05 (1.03)	2.39 (1.49)	1.13 (1.34)
		Non- user	4.01 (1.72)	4.32 (1.76)	2.25 (1.24)	1.67 (1.22)
		P value	<0.001	0.354	0.532	0.007
ALT	Lifetime	User	4.74 (1.61)	4.16 (1.87)	2.11 (1.45)	1.16 (1.26)
		Non- user	4.22 (1.63)	4.28 (1.79)	2.52 (1.15)	1.83 (1.23)
		P value	0.039	0.671	0.044	0.001
	Past 12 month Use	User	4.96 (1.63)	4.16 (1.85)	2.09 (1.49)	0.93 (1.34)
		Non- user	4.26 (1.60)	4.25 (1.82)	2.41 (1.23)	1.73 (1.19)
		P value	0.007	0.751	0.131	<0.001
VIT	Lifetime	User	4.69 (1.53)	4.16 (1.88)	2.21 (1.41)	1.36 (1.25)
		Non- user	4.09 (1.78)	4.37 (1.71)	2.53 (1.10)	1.75 (1.34)
		P value	0.013	0.482	0.146	0.076
	Past 12 month Use	User	4.88 (1.50)	4.12 (1.86)	2.27 (1.45)	1.33 (1.33)
		Non- user	4.13 (1.68)	4.31 (1.81)	2.34 (1.21)	1.62 (1.24)
		P value	0.003	0.488	0.724	0.136
CMP	Lifetime	User	4.63 (1.75)	4.19 (1.88)	2.44 (1.40)	1.31 (1.29)
		Non- user	4.40 (1.55)	4.25 (1.80)	2.21 (1.28)	1.59 (1.28)
		P value	0.373	0.835	0.252	0.171
	Past 12 month Use	User	4.90 (1.54)	4.34 (2.02)	2.48 (1.50)	0.96 (1.22)
		Non- user	4.41 (1.65)	4.20 (1.79)	2.27 (1.29)	1.59 (1.27)
		P value	0.147	0.690	0.424	0.012

NHP: Chamomile, Ginseng, Echinacea, Garlic, Cod liver oil, Ginkgo, Glucosamine, Lecithin, Kava kava, St. John’s wort, Valerian, Saw palmetto, Evening primrose oil.**ALT:** Meditation/relaxation techniques/ visualization/ imagery, Yoga, Tai chi, Homeopathy, Traditional Chinese Medicine, Biofeedback, Hypnosis.**VIT:** Multivitamin; Vitamin (A, B, C, E); Calcium; Magnesium.**CMP:** Chiropractor, Massage Therapist, Acupuncturist, Ayurvedic Practitioner, Herbalist, Naturopath, Homeopath, Reflexologist, Reiki Healer, Aboriginal Healer, Therapeutic Touch Practitioner, Doctor practicing complementary and alternative medicine.

Table 3 compares the perceived benefits and safety of CAM and conventional medicines by users and non-users of NHP, ALT, VIT, CMP with

respect to their perceptions of the benefits and safety of NHP and conventional medicines. Lifetime users of NHP scored significantly higher on their perception of both the benefits and the safety of CAM ($p < 0.001$; $p < 0.001$), and scored significantly lower on their perception of safety for conventional medicine compared to lifetime non-users of NHP ($p = 0.007$). However, the use of NHP had no impact on the perceived benefits of conventional medicine. These results were similar for subjects using NHP within the last 12 months. Lifetime users of ALT attributed greater benefit to CAM than lifetime non-users of ALT ($p = 0.39$) but lifetime users of ALT also perceived NHP (not including vitamins and minerals) to be less safe than non-users ($p = 0.44$) (i.e., users of ALT were more likely to recognize the potential for side effects from CAM). Use of CAM therapies was not associated with a difference in perceived benefit of conventional medicine ($p = 0.671$). We found no difference in the perceptions of benefit and safety of CAM between those that reported visits to CMP and those that did not, though those reporting recent visits to CMP were more likely to attribute adverse effects to conventional medicine. Participants who reported the use of VIT rated the attributes of CAM as more beneficial than non-users of VIT. No differences were found between users and non-users of VIT with respect to views about the safety of CAM or the benefits and safety of conventional medicine.

Discussion

This is the first study to report quantitative data estimating the lifetime and 12-month prevalence of use of CAM modalities and subjective assessments of the perceived safety and benefits of these modalities and products in patients with schizophrenia and related primary psychotic disorders. The principle finding from this survey is a very high lifetime prevalence of 88% of these therapies in patients with a primary psychotic disorder, which is not different from data derived from larger epidemiological surveys within the Canadian population. The pattern of use was also similar to that reported in the general population: the most commonly visited CAM practitioner is the chiropractor (Canadian population: 40%; our survey: 20.9%) (Esmail, 2007) and the most commonly used CAM therapy is meditation/relaxation (Canadian population: 20%; our survey 25%) (Esmail, 2007). Similarly, vitamins are the most frequently used in both populations (Canadian population: 57.%, our survey: 70.3%) (Health Canada, 2005).

These findings were surprising for a number of reasons. First, surveys of the general population have shown that individuals with higher incomes or more formal education are more likely to use complementary and alternative therapies including NHP (Fisher & Ward, 1994; National Institutes of Health, 2007). In our study, the highest education attained by most of the participants was a high school

diploma, and their annual income that was less than \$10,000 - thus we expected lower use than the general population. Studies of other groups of individuals with mental illness have found rates of CAM use that are similar both to the general public and to our findings. For example, in a self-report survey involving inpatients with mental illness, 63% used at least one CAM modality, and the majority of these patients were high school graduates (Ramsay et al, 1999). In another study involving a community mental health service, high use of CAM was found among Chinese Americans who were employed and had completed high school education (Fang & Schinke, 2007). Identical findings were found with psychiatric inpatients in Germany (Assion et al., 2007). Finally, we found a high rate of use of CAM in our sample which was predominantly male (72%). All of these findings challenge the assumption that CAM use is concentrated in females with high incomes and education.

Persons suffering from schizophrenia and related psychotic disorders tend to suffer from decreased motivation as part of their illness and would therefore be expected to be less proactive in exploring alternative therapeutic modalities. In contrast, patients with mood and anxiety disorders are known to be more likely to engage in help seeking behaviours (Assion et al., 2007; National Center for Complementary and Alternative Medicine, 2007; Statistic Canada, 2003). Our finding of a high prevalence of all types of CAM (88%) and NHP (63%) use in this population was therefore unexpected.

Why would patients with schizophrenia and related psychotic disorders seek out CAM despite low incomes, poor education, and the presence of negative symptoms such as apathy and amotivation? Possible explanations to account for this high use include the perceived lack of efficacy in conventional medications in decreasing distress experienced in their illnesses (Assion et al., 2007) and the use of NHPs to counter the side effects of the prescribed psychiatric medications (Fang & Schinke, 2007). NHPs may also be used for conditions unrelated to their psychiatric diagnoses (e.g., echinacea for the common cold (Yale & Liu, 2004) or glucosamine for osteoarthritis (Christgau et al., 2004). It is unclear in our study whether NHPs were being used for a psychiatric disorder or for other reasons including side effects from psychiatric medications. On the other hand, the high use may be interpreted as a way of patients taking some control over their treatment that they often perceive as imposed by their clinicians given a decreased level of insight associated with schizophrenia. CAM use could also resonate with their philosophical values and beliefs (Assion et al., 2007; National Center for Complementary and Alternative Medicine, 2007). This study was not designed to elucidate the motivation behind these behaviours.

We are concerned with our finding of a high level of reluctance on the part of participants to disclose their use of CAM to their health care providers, even if this is consistent with published results from the general population (Assion et al.,

2007; Chen et al., 1997; National Center for Complementary and Alternative Medicine, 2007). Although the reasons are unknown, previous qualitative field studies used as pilot data for this study (personal communication, Dr. Mamo) suggest that this population may not perceive conventional medical practitioners to be in a position to advise them on their use of CAM. The public health significance of this observation is self evident in view of the potential adverse effects and interactions with prescription medications. Although CAM has a reputation for being natural (which, for most lay persons is synonymous with safe), this assumption is incorrect. For example, kava kava, a naturally occurring antianxiety agent has been withdrawn as it has been associated with hepatotoxicity (Fang & Schinke, 2007). Wernike et al. (2006) reviewed 2700 studies for 20 remedies such as ginkgo and St. John's wort that may be used to alleviate psychiatric ailments (American Psychiatric Association, 1994; Natural Standard, 2007). The safety of these remedies for the treatment of psychiatric disorders has not been established and more systematic clinical trials are clearly needed to establish the safety and therapeutic efficacy of these products (American Psychiatric Association, 1994; Natural Standard, 2007).

This leads to a discussion about concerns regarding the potential vulnerability of this population. Partial response to antipsychotic treatment is very common, leaving clients with distressing residual symptoms (Alphs, 2006; Stahl & Buckley, 2007). Schmid and Brunisholz (2007) found that the motivation for using CAM included personal interest and the influence of friends, family and acquaintances. The cognitive deficits (Rajji & Mulsant, 2008) prevalent in this population may make it difficult for many of them to critically assess the safety and effectiveness of CAM. Hence this population may be vulnerable to the marketing strategies used to promote CAM modalities and the potentially misleading influence of friends and family members. This suggests an urgency to further study the reasons for use of CAM in this population.

Based on the results of this study, clinicians responsible for the care of patients with schizophrenia and related psychotic disorders should consider including an assessment of current and past CAM use in their routine medical workups. A non-judgmental approach and genuine interest in the use of CAM may also have the added benefit of enhancing the therapeutic alliance between patient and clinician. Given the complexities of drug interactions, a discussion of the potential risk of concomitant use of NHP with psychotropic agents is recommended, and referral to a pharmacist may be indicated if the clinician lacks expertise in drug NHP interactions. Although some patients may choose to use NHPs as alternatives to conventional treatment, many decide to use them in addition to prescribed medications. In contrast to the reported adverse effects from NHP use in epidemiological studies, (Fisher & Ward, 1994) the majority of respondents to our survey reported experiencing side effects from their

prescription medications instead of NHPs. Thus clinicians would be wise to heed their clients' perceptions and subjective experiences of both prescription medications and NHP - not only would this have implications for safe prescribing but it would also likely have beneficial effects on medication adherence. This is especially important since the participants in this study perceived the use of NHP positively, a finding that reflects the views of the general population (Fisher & Ward, 1994; National Institutes of Health, 2007). Users of NHP also acknowledge the benefits of conventional medication. This is important since many conventional clinicians associate NHP use with a belief that conventional medicine lacks its purported benefits – our results refute this stereotype. It is encouraging to note that in our sample, users of NHP were more likely than non users of NHPs to recognize and acknowledge the adverse effects of NHP. Not surprisingly, lifetime users of CAM attribute greater benefit to NHP than non users, but they were more likely to acknowledge potential adverse effects from NHPs.

The results of the study need to be interpreted within the context of a number of limitations of the study design. While it would have been ideal to randomly sample the population, our pilot work suggested that this was not feasible. This population is known to have deficits in cognition and executive functioning (Rajji & Mulsant, 2008) and to be typically unable to adhere to appointments, making it difficult to reach them using common population survey methods (e.g., telephone, mailed or internet-based surveys). Thus our study used a convenience sample of participants who either self-referred after seeing posters or accepted a referral from a clinician. This sampling incurs the risk of an ascertainment bias, potentially inflating the prevalence of CAM use in this population. Furthermore, some VIT such as vitamin E (Arvindakshan et al., 2003) and B (Lerner et al., 2004) may have been prescribed for conditions such as tardive dyskinesia, and therefore represent a more conventional therapy. In addition, the study design did not take into account the participants' mental states at the time of completion of the survey. It is possible that this may have been an important hidden factor in the interpretation of the results. Finally, the survey was not designed to elucidate the motivation and reasons behind the use of CAM, limiting our ability to derive an explanatory model for the high CAM use observed in the study.

Notwithstanding these limitations, this study reports on the prevalence of CAM use in the severely mentally ill within the Schizophrenia program at the Centre of Addiction and Mental Health. Contrary to our expectation, we found that the prevalence and attitudes towards CAM use and conventional medicine to be similar to published reports in the general population. The findings highlight the importance of including a review of CAM use in routine clinical practice in patients with severe mental illness, and dispel a number of myths and stereotypes

pertaining to the use of CAM in this population. This study also highlights the apparent lack of communication between clinicians and patients about CAM use and our lack of knowledge about mental health clinicians' attitudes toward CAM. Future studies to explore the motivation underlying the use of the respective CAM modalities are needed to provide an explanatory model for these observations.

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