



**INVESTIGATING THE IMPACTS OF SOCIAL NETWORK SITE USE ON THE
PSYCHOLOGICAL WELL-BEING OF CANCER AFFECTED PEOPLE**

By

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CERTIFICATION

This thesis by publication is submitted in fulfilment of the requirements of the degree of PhD, in the Faculty of Business and Economics, Macquarie University. This represents the original work and contribution of the author, except as acknowledged by general and specific references.

I hereby certify that this has not been submitted for a higher degree to any other university or institution.

Signed:

Seyedezahra Shadi Erfani

18/04/2015

Dedication

TO THE LOVING MEMORY OF MY LOVELY FATHER

TO MY LOVING AND CARING HUSBAND AMIN AND
DAUGHTER KIMIYA

My personal motivation for this research was my father's cancer diagnosis and subsequent death. I wanted to discover more about how SNSs could support people diagnosed with cancer, and in particular enable cancer-affected people to find information and support and improve their psychological well-being.

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ACKNOWLEDGEMENT OF CONTRIBUTION TO THE RESEARCH WORK AND/OR AUTHORSHIP

This thesis by publication includes four original papers either published or under review. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of the candidate, working within the Macquarie University-Faculty of Business and Economics under the supervision of Dr Yvette Blount and Dr Babak Abedin. The four papers are described below.

Paper 1: The use of Social Network Sites and psychological well-being: a systematic review
Journal: Communications of the association for information systems
Status: Under review
Abstract A systematic literature review has been conducted to lay the groundwork for understanding the relationship between the use of Social Network Sites (SNSs) and psychological well-being, and devising strategies for taking advantage of this relationship. The review included studies published between 2003 and 2014 that empirically tested the relation between an individual's psychological well-being and their use of SNSs. Science Direct, Springer Link, IEEE Explore, Google Scholar, PsychInfo, Scopus and expert consultation were used to select 96 articles, ten of which met the selection criteria. Findings revealed a positive relationship between the use of SNSs and psychological well-being. This study revealed the existence of weak theoretical justifications for the relationship between SNS use and psychological well-being. It also found that most of previous studies have relied on student participants. Little is known about the impact of SNSs use on the psychological well-being of other cohorts of SNS users. This review will help investigators to set priorities for future research on SNSs and psychological well-being, and will encourage social and health services to use SNSs for enhancing users' psychological well-being. Keywords: Systematic literature review, Social Network Sites, psychological well-being
Author's contribution: 90%

Paper 2: Effects of Internet-based interventions on the psychological well-being of cancer- affected people: A systematic literature review
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Journal: International Technology Management Review

Status: Published

Abstract

<p>To lay the groundwork for understanding the relationship between the use of Internet-based interventions and psychological well-being of cancer affected people and devising strategies for taking advantage of this relationship, we conducted a systematic literature review. This review undertook published studies between 1993 and 2014 addressing the effects of Internet based-interventions on psychological well-being of cancer affected. Science Direct, Springer Link, IEEE Explore, Google Scholar, and expert consultation to select articles resulted in 28 articles of which met the selection criteria. Results showed the use of Internet- based interventions by cancer-affected people has positive influence on their psychological well-being. This review revealed that previous studies extremely focused on websites, online forums, email listservs, bulletin boards and blogs for improving psychological well-being of cancer affected people. Other Internet-based interventions such as Social Network Sites have been neglected in past research. This review will help investigators set priorities for future research on Social Network Sites and psychological well-being of cancer affected people</p>
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Keywords: Internet-based Interventions, Psychological Well-being, Cancer-affected People.
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Author's contribution: 90%

Paper 3: The influence of health-specific Social Network Site use on the psychological well-being of cancer-affected people

Journal: The journal of the American medical informatics association

Status: Under revision

Abstract

Objective: We aimed to explore and examine how and in what ways the use of Social Network Sites (SNSs) is related to psychological well-being, of cancer-affected people.

Methods and Materials: Qualitative semi-structured interviews were conducted with users of the Ovarian Cancer Australia Facebook page (OCA Facebook). Twenty-five women who were affected by ovarian cancer and were users of OCA Facebook were interviewed. A multi-theory perspective was employed to interpret the data.

Results: Results showed most interviewees used OCA Facebook daily. Some users were passive and only observed created contents; others actively posted content and communicated with other members. Analysis showed that the use of OCA Facebook enhances social support, improves the experience of social connectedness, develops social presence and learning – and ultimately, improves psychological well-being.

Discussion: The strong theoretical underpinning of our research and empirically derived results produced a new understanding of the capacity of SNSs to improve psychological well-being. Our study provides evidence enabling the integration of these tools into existing health services. This study also contributes to formal knowledge of the implications of SNS use for the psychological well-being of cancer-affected people.

Conclusion: This research assessed the relationship between the use of OCA Facebook and the psychological well-being of cancer-affected people, and confirmed the capacity of this SNS to improve psychological well-being, demonstrating the potential value of SNSs within support services in the health care industry.

Keywords: Social network sites, Facebook, cancer-affected people, psychological well-being, social support, social connectedness, learning, social presence.

Author's contribution: 85%

Paper 4 – The effect of social network site on the psychological well-being of cancer-affected people

Journal: Journal of the association for information science and technology

Status: Under revision

Abstract

Social Network Sites (SNSs) are growing in popularity and social significance. Although researchers have attempted to explain the effect of SNS use on users' psychological well-being, previous studies have produced inconsistent results. In addition, most previous studies relied on healthy students as participants, and therefore have ignored or have paid less attention to other cohorts of users. In particular little is known about the impact of SNSs use on the psychological well-being of people living with serious health condition. In this study, we identified the factors that derive from the use of SNSs and which improve cancer-affected people' psychological well-being. This study examined the impacts of Facebook use on the psychological well-being of cancer-affected people, specifically the members of Ovarian Cancer Australia (OCA) Facebook. Using online survey data collected from 154 cancer-affected people aged 18–60 tested a theoretical model with eight hypotheses. The theoretical model showed social support, social connectedness, social presence and learning mediates the positive impact of SNSs use on the psychological well-being of cancer-affected people. The theoretical basis and empirically derived results from this study contributes to a better understanding of the ways and extent that SNS use is associated with psychological well-being of cancer-affected people. The findings should encourage organisations involved in the care of cancer-affected people, and cancer-affected people themselves, to use Facebook to improve their psychological well-being.

Key words: Social Network Sites, Facebook, cancer-affected people, psychological well-being, social support, social connectedness, social presence, learning, theoretical model.

Author's contribution:85%

Feedback received from Information Systems community

Americas Conference of Information Systems (AMCIS 2013)
International Conference on Information Society (i. Society 2013)
Australasian Conference on Information Systems (ACIS2014)

Abstract

Social Network Sites (SNSs) allow users to create online profiles and content, establish connections, share content, develop interactions with their connections and consume content provided by their network. The rapid growth in the number of users of SNSs makes it important to examine their impact on users and their potential to improve psychological well-being. A major limitation of most previous studies was that they relied on healthy students as participants. Little research attention has been paid to the ability of SNSs to promote the psychological well-being of other cohorts of SNS users.

People affected by cancer are using SNSs such as Facebook for informational and emotional exchange with people with the same health concern. This research examined the impact of SNSs use on the psychological well-being of the users of the Ovarian Cancer Australia (OCA) Facebook. Using a mixed-methods approach, this research sought to answer the question: In what ways and to what extent does SNS use impact the psychological well-being of cancer-affected people?

Semi-structured interviews with users of the OCA Facebook were used to assess how and in what ways SNSs use impacts the psychological well-being of cancer-affected people. A theoretical model was proposed to develop a better understanding of the relationship. Analysis of data collected through a subsequent quantitative survey confirmed the theoretical model and empirically revealed the extent to which SNSs use impacts the psychological well-being of cancer-affected people. Analysis showed that the use of OCA Facebook enhances social support, improves the experience of social connectedness, develops social presence and learning – and ultimately, improves psychological well-being. This study contributes to a better understanding of the ways that SNSs use is associated with psychological well-being

among cancer-affected people. Our theoretical model improves understanding of the factors that mediate the positive impact of Facebook use on the psychological well-being of cancer-affected people.

GLOSSARY OF TERMS

Social Networks Sites: Social Network sites are networked communication platforms on which users can create profiles and content, establish connections, share content, develop interactions and consume content provided by their network members (Berger et al., 2014).

Cancer-affected people: People who have been diagnosed with cancer, including those who are in treatment or have completed their treatment (Ovarian Cancer Australia, 2014).

Psychological well-being: “Psychological well-being refers to the extent in which one holds positive attitude toward oneself, to the extent in which one forms warming satisfying relationship, to extent in which one is able to resist social pressures, to the extent in which one feel competent to create context suitable to personal need, to the extent one has goal in life and to the extent in which one has a feeling of continued development” (Ryff &Keyes, 1995).

Social presence: Social presence is defined as a sense of understanding communications in community and being with others (Xu et al., 2012).

e-Health: The use of internet related technology for health purposes (Cunningham et al., 2014).

e-Health field: “An emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered through the Internet and related technologies” (Bender et al., 2011)

Web 2.0: A second generation of the World Wide Web that supports active participation, connectivity, collaboration and sharing of knowledge among users (Sykes, 2013).

Blog: Blog is a type of web-based application commonly used as an online diary and often updated with new information about particular topics by individuals or groups (Sykes, 2013).

Chatroom: Chat room is used to describe synchronous conferencing and is a web-based application that supports one-on-one or group interaction (Bender et al., 2011).

Mailing list: Commonly known as "listservs," are electronic discussions groups that participants' discussions are sent to participants via e-mail (Sykes, 2013).

Message board: Commonly known as bulletin boards or discussion forums are online discussion sites where people with same interest can hold discussions in the form of posted messages (Heidemann et al., 2012).

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CHAPTER 1:

INTRODUCTION TO THE THESIS

Many studies have affirmed the capacity of SNSs for social and organisational improvement (Von Krogh, 2012; Aral & Godes, 2013; Maghrabi & Salam, 2013; Huang et al., 2014; Pan et al., 2015), but little research attention has been paid to the capabilities of SNSs for health purposes.

Social Network Sites (SNSs) are networked communication platforms in which users can create profiles and content, establish connections, share content, develop interactions with their connections and consume content provided by their network (Ellison & Boyd, 2013; Berger et al., 2014). Information Systems researchers have highlighted the capacity of SNSs to foster informational and emotional exchange, knowledge sharing and the development of extensive supportive interactions (Ellison & Boyd, 2013, Berger et al., 2014; Oh et al., 2014; Lin et al., 2015; Utz, 2015). SNSs used in e-health have specific characteristics for fostering health-related informational and emotional support exchange (Bender et al., 2011; Zagaar & Paul, 2012; Bui & Honavar, 2015), and e-health studies have shown informational and emotional support enhances psychological well-being (Gustafson et al., 2005; Hong et al., 2012; liu et al., 2014). However, to date little research attention has been paid to the ability of SNSs to promote the psychological well-being of cancer-affected people (Hong et al., 2012). Psychological well-being is conceptualised as feeling happy, capable, well supported, and satisfied with life (Huppert, 2009; Winefield et al., 2012; Moyer et al., 2014). In this thesis, the term “cancer-affected people” is used to refer to people who have been diagnosed with cancer, including those who are either in treatment or have completed their treatment.

1.1 Background

SNSs have become well established in modern individuals’ lives (Bui & Honavar, 2015). The enormous social and economic importance of SNSs has driven the development of SNS-based research in many areas over the past decade (Berger et al., 2014). Millions of people use SNSs every day for interactive communication, information search and community purposes (Hajli, 2014; Berger et al., 2014). One of the most popular SNSs, Facebook, launched in February

2004, had counts for more than with 900 million active users in 2015 (eBizMBA, 2015) <http://www.ebizmba.com/> (last visited September 2015).

The SNS research literature reviewed in this thesis can be divided into four broad groups by topic, as described below.

- The characteristics of SNSs, including: origin and development (Heidemann et al., 2012; Wilson et al., 2012), type and structures (Heidemann et al., 2010; Wigand et al., 2010; Wilson et al., 2011; Quinio & Marciniak, 2013).
- The characteristics of users of SNSs, such as: motivations and intentions (Maier et al., 2007; Hu et al., 2011; Xu et al., 2012; Ku, Chen and Zhang, 2013; Huang et al., 2014; Pan et al., 2015), behaviour (Guo et al., 2011), and interaction and communication (Wilson et al., 2012; Ng et al., 2013).
- Functionalities of SNSs for organizational purposes, such as using SNSs for generating new ideas and developing new products (Jain, 2010), improving customer services (Storni & Griffin, 2009), recruiting business professionals (Garg and Telang, 2012; Pike et al., 2012), and fostering collaboration, communication, and knowledge management (Aral & Godes, 2013; Berger et al., 2014).
- Functionalities of SNSs for societal purposes, such as for teaching purposes (Shim et al., 2011; Magro et al., 2012), for political purposes (Misiolek & Wozencroft, 2010; Maghrabi & Salam, 2013), social interaction and social presence (Xu et al., 2012; Von Krogh, 2012; Pan et al., 2015), emergency management (Albert & Salam, 2012; Demetz et al., 2011; Babu & Singh, 2013).

SNSs are growing in popularity and social significance and gained prominence as avenues for interactive communication, information search and community links (Nadkarni & Hofmann, 2012; Ellison & Boyd, 2013). To facilitate communication among users, SNSs such as Facebook offer various messaging services including private and public messaging (Heidemann et al., 2012, p.7). In the course of information dissemination, Facebook allows users to create content on their own message board, called a wall, or post content to another user's wall (Burke et al., 2010). Users can spread wall posts in their networks via information distribution functionality such as 'share', 'like' and 'tag photos' with only a single click, (Berger et al., 2014).

1.2 Research objective and research questions

The explosive growth of SNSs has made SNS use and its consequences increasingly popular topics for research (Ahn, 2011; Huang et al., 2014; Wilson et al., 2012). Many studies have affirmed the capacity of SNSs for social and organisational improvement (Von Krogh, 2012; Aral & Godes, 2013; Maghrabi & Salam, 2013; Huang et al., 2014; Pan et al., 2015), but little research attention has been paid to the capabilities of SNSs for health purposes (Bender et al., 2011).

SNSs have become an important part of many people's lives (Ellison & Boyd, 2013), and many users spend hours using SNSs each week or even each day (Junglas et al., 2013). The use of SNSs has implications for psychological well-being of the users (Reinecke & Trepte, 2014). Some studies have established correlations between the use of SNS and psychological well-being (Guo et al., 2013; Kalpidou et al., 2011; Nabi et al., 2013); however the results have been inconsistent. Most previous studies have shown a positive relationship between the use of SNSs and individuals' psychological well-being (Guo et al., 2013; Nabi et al., 2013;

Oh, Ozkaya, & LaRose, 2014). However, few studies have not shown this correlation (Kalpidou et al., 2011). The inconsistent results could be explained by differences in research design (Samson & Terziovski, 1999), insufficient theoretical justification for the relationship between SNS use and psychological well-being, or different mediating variables that might predict psychological well-being derived from the use of SNSs (Oh et al., 2014). For example, Kalpidou et al. (2011) used the number of SNS friends as a direct predictor of users' psychological well-being and failed to detect a positive relationship. However, Nabi et al. (2013) showed the number of Facebook friends was related to the individual's perception of social support, which in turn was associated with greater psychological well-being (Nabi et al. 2013). The inconsistencies have led to recent studies that have called for the establishment of a clear understanding of the impact of SNS use on users' psychological well-being (Oh et al., 2014; Reinecke & Trepte, 2014) and the development of a comprehensive theoretical model (Guo et al., 2014; Apolaza et al., 2013). Therefore, the goal of this thesis is to develop a theoretical model that shows the relationship between SNS use and the psychological well-being of cancer-affected people.

Cancer-affected people were selected as the study population because most previous studies of the effect of SNS use on psychological well-being involved young and healthy students. However, using students as the population sample may lead to difficulty in generalising the findings to other cohort of SNS users (Burke et al., 2011). We need a better understanding of the impact of SNS use on the psychological well-being of different users of SNSs (Guo et al., 2014). Less research attention has been paid to the less healthy people and people living with serious health conditions that could (theoretically) benefit from SNS use (Erfani et al., 2013). SNS use could bring together cancer patients, their friends and family to exchange health-

related information and emotionally support others with similar health concerns (Farmer et al., 2009; Bender et al., 2011; Westbrook, 2015).

A diagnosis of cancer is a life-changing event and takes a great toll on a person's psychological well-being (Moyer et al., 2014). Developing knowledge and providing evidence of novel tools and technologies that can improve cancer patients' psychological well-being is a gap (Hong et al., 2012; McLaughlin et al., 2012) that is addressed in this study. Little research to date has shown the relationship between SNS use and improvement in cancer-affected people's psychological well-being (Hong et al., 2012; Erfani & Abedin, 2014).

SNSs offer coordination and immediate access (Nusair et al., 2013; Huang et al., 2014) and are accessible through multiple communication platforms (Xu et al., 2012). SNSs have specific characteristics for maximising supportive interaction with likeminded people and exchanging informational and emotional support (Bender et al., 2011; Zagaar & Paul, 2012; Bui & Honavar, 2015). Despite the clear benefits of SNSs for health support, the literature lacks a clear theoretical basis and empirically derived evidence for integrating these tools and data into existing health programs and systems. The effect of some dynamic health-related web-based applications (Web 2.0), such as blogs and forums, on the psychological well-being of cancer-affected people has been examined (Gustafson et al., 1994; Klemm et al., 1998), but little is known about the specific impact of SNS use on the psychological well-being of cancer-affected people (Hong et al., 2012; Erfani & Abedin, 2014). In addition, research on the theoretical underpinnings of online cancer support is sparse (Hong et al., 2012; Erfani & Abedin, 2014). Given the limitations of the extant literature on SNS use and the impact on psychosocial well-being discussed above, namely:

- insufficient theoretical justification for the relationship between use of SNS and psychological well-being
- A focus on young and healthy students, neglecting people living with serious health conditions who could (theoretically) benefit greatly from SNS
- Lack of research on the impact of SNS use on the psychological well-being of cancer-affected people
- Lack of theoretical underpinnings for the concept of online cancer support,

The research aim was to investigate the impact of SNS use on the psychological well-being of cancer-affected people and develop a theoretical model that depicts the relationship. The research needed to be exploratory and confirmatory (Creswell, 2013), because of the lack of research specifically related to both SNS and cancer-affected people. The research aim was supported by the following questions:

RQ1: How and in what ways does SNS use impact the psychological well-being of cancer-affected people?

RQ2: To what extent does SNS use impact the psychological well-being of cancer-affected people?

1.3 Research Design

This research used a mixed methods design to investigate the impact of SNSs use on the psychological well-being of cancer-affected people. Mixed methods approach that combines qualitative and quantitative data is desirable for the examination of social phenomenon, which cannot be fully comprehended by either only qualitative or quantitative techniques (Teddle & Tashakkori, 2003). Little is known about the use of SNS and psychological well-being of cancer-affected people. Accordingly applying a mixed methods approach is ideal for

investigating the impact of SNSs use on the psychological well-being of cancer-affected people. This enables researcher to collect, analyse, combine and draw conclusions from qualitative and quantitative data that leads to unique insight (Creswell, 2013).

Mixed Methods Approach

Mixed method research is known as the third methodological movement in the social and behavioural sciences and refers to ‘triangulating’ of data from different data sources (Teddlie & Tashakkori, 2003; Bender et al., 2011). The main methodological orientation for much of 20th century was quantitative methods and the positivism paradigm. Positivism holds that knowledge creation should be limited to what can be observed and measured (Bhattacharjee, 2012). Quantitative methods defined as the techniques associated with the gathering, analysis, interpretation, and presentation of numerical information (Atkinson & Hammersley, 1994). Second methodological movement, which was known in 1970s and 1980s, was qualitative methods and the constructivist paradigm (Bender et al., 2011). This methodological movement emerged as a result of unhappiness with the principal views of positivism (Teddlie & Tashakkori, 2003). Qualitative methods are defined as the techniques associated with the gathering, analysis, interpretation, and presentation of narrative information (Creswell, 2013). Constructivism believes that knowledge is socially and historically constructed (Lincoln & Guba, 2000). The ‘paradigm wars’ between the quantitative and qualitative researchers led to emergence of mixed methods in the 1990s (Teddlie & Tashakkori, 2003). A philosophical orientation with mixed methods is pragmatism (Cresswell, 2013).

Research Method

With applied research objectives, research questions and social phenomenon under study, a pragmatic philosophy was well suited to investigate the role of SNSs use on the psychological wellbeing of cancer-affected. This thesis followed the basic principles of pragmatism; the research is influenced by the value of the researcher and the theory that researcher applies, and the idea that facts can be supported by multi-theory perspective (Teddlie & Tashakkori, 2003; Bender et al., 2011).

This study aimed to understand how, in what ways and to what extent SNSs is related to the psychological well-being of people affected by cancer. Using a case study method is appropriate for developing knowledge in a particular area (Yin, 2008) and case study examines a phenomenon in its natural setting (Benbasat et al., 1987). A case study research methodology was adopted because it is appropriate for developing in-depth knowledge (Yin, 2013). Ovarian Cancer Australia Facebook page (hereafter OCA Facebook) was chosen as research platform because it is used by large numbers of cancer-affected people for informational and emotional purposes (Erfani et al., 2013). In February 2014 OCA Facebook had 9,499 members, with an average of 16 posts, 40 comments, and 15 shares every week, suggesting it is an active online environment (Hajli, 2014). OCA Facebook is maintained and moderated by Ovarian Cancer Australia, an independent national organization that supports people affected by ovarian cancer. OCA Facebook provides cancer-affected people with support, offers authoritative cancer-related information, promotes cancer awareness events, and suggests positive behaviours to stay healthy while living with cancer. OCA Facebook also enables people affected by ovarian cancer to connect and exchange details about their conditions, treatments

and symptoms of ovarian cancer, and support one another. Commercial and unrelated content and negative comments and posts are not permitted.

Systematic literature review methodology was used in this thesis to develop a general linkage between SNS and psychological well-being, and a general understanding of the linkage between a range of Internet-based interventions and the psychological well-being of cancer-affected people. These two systematic reviews serve as a foundation for more in-depth research designed to answer the research questions. The purpose of a systematic review is to present a rational evaluation of a research topic by using reliable and systematic procedures (Oxman & Guyatt, 1993).

In qualitative phase an interpretive qualitative approach was used to explore the relationship between SNS use and psychological well-being. This was appropriate because the objective was to understand the experiences of people involved in the study (Kurnia et. al., 2015). Semi-structured interviews with users of the OCA Facebook were carried out to assess the ways in which SNS use impacts the psychological well-being of cancer affected people. Twenty-five women who were affected by ovarian cancer and were users of OCA Facebook were interviewed. A multi-theory perspective was employed to interpret the data. A theoretical model was proposed to develop a better understanding of the relationships between SNS use and the psychological wellbeing of cancer-affected people.

The second phase of the research used a quantitative approach to empirically examine the extent to which SNS use impacts the psychological well-being of cancer-affected people. In the quantitative phase, a cross-sectional descriptive survey was used to identify to what extent SNS use impact psychological well-being of cancer-affected people. Survey is a research instrument comprising of a set of questions envisioned to take responses from respondents in

a standardized way (Dillman & Christian, 2009). In cross-sectional field surveys, “independent and dependent variables are measured at the same point in time” (Bhattacharjee, 2012, p.49). Using online survey data collected from 154 cancer-affected people aged 18–60. The theoretical model was validated and empirically revealed the extent to which SNS use impacts the psychological well-being of cancer-affected people.

Philosophical Orientation

Pragmatism as the philosophical foundation has guided the design of this study. Pragmatism emerged as a philosophical tradition in the 1990s. Pragmatism first explained by Charles Peirce (1877) in the United States and further developed by amongst others William James (1909) and John Dewey (1938) (Maxcy, 2003). Pragmatism “is not committed to any one system of philosophy and reality, pragmatism do not see the world as an absolute unity, and pragmatism opens the door to multiple methods and different forms of data collection and analysis in the mixed methods study” (Cresswell, 2013, p.12). Pragmatic researchers suggest that researcher should employ the philosophical or methodological approach that suits for a particular research problem or issue. Pragmatic approach supports the use of both qualitative and quantitative research methods in the same study (Teddlie & Tashakkori, 2003).

1.4 Research Ethics

This study received an ethical and scientific approval from Human Research Ethics Committee (Medical Sciences) in November 2013 (Appendix III). The ethics approval process required completing a structured application providing complete information about the research project, the researchers (Chief investigators and co-investigator), and details on how the participants’ rights will be protected. Additional documentation such as the Participant Information and Consent Form (PICF), research questionnaire and interview protocol were

also needed (Appendix VI). Some of the expected tenets of ethical behaviour that are widely accepted within the scientific community and were considered in this study are as follows:

Voluntary participation and harmlessness Participants in this study were informed that their participation in the study is voluntary, that they have the freedom to withdraw from the study at any time without any unfavourable consequences, and they are not harmed as a result of their participation or non-participation in the study. Furthermore, all participants received and signed an PICF that clearly describes their right to not participate and right to withdraw, before their responses in the study can be recorded.

Anonymity and confidentiality To protect participants' interests and future well-being, their identity was protected in this study. Anonymity means that the researcher or readers of the final research report cannot identify a given response with an exact participant. To this end, in this study no identification numbers were used to track who is responding to the survey. In interviews, anonymity was not possible but participants were ensured confidentiality, in which the researcher could identify participants' responses, but guarantees not to disclose that person's name in any report and article.

Disclosure Some information about this study was provided to potential participants before data collection to help them decide whether or not they wish to participate in the study. For instance, who is conducting the research, for what purpose, who can participate in the study, what are potential benefits of the study, who should participants contact if they have concerns about the study.

Carrying out research on cancer-affected people To control and manage participants' distress, researcher conducted the interviews under direct supervision of supervisors. In addition the researchers made sure that a third party such as caregiver, family member or friend

accompanied the participant during the interview. Most of interviews were conducted via phone or Skype. However in the case that participant preferred to have face-to-face interviews the interviews were conducted in protected environments where access to counsellor or advisor was available. Furthermore an appointment with counsellor was made, to be on-call during all interviews. In addition details about Cancer Help Line and Lifeline were provided in the introduction of survey.

1.5 Organisation of the thesis

The thesis has a ‘by publication’ format; it comprises four academic papers as well as introduction and conclusion chapters. Paper One is a systematic review paper that establishes the current state of knowledge about the linkage between SNS use and psychological well-being. Paper Two is also a systematic review; this paper provides a structured review of existing research on the effect of Internet-based interventions on the psychological well-being of cancer-affected people and showed that internet-based interventions can positively influence the psychological well-being of cancer-affected people. Paper Three describes investigation of the impact of SNS use on the psychological well-being of cancer-affected people using a qualitative study based on users of the OCA Facebook. Paper Three includes a description of the theoretical model developed to improve understanding of the positive relation between OCA Facebook use and psychological well-being of cancer-affected people. Paper Four presents a quantitative study of OCA Facebook use on the psychological well-being of cancer-affected people, based on survey data collected from 154 cancer-affected people aged 18–60 years. Paper Four demonstrates the work performed to test theoretical model that was developed in paper Three. It shows that the model was empirically validated

through a quantitative survey and empirically revealed the extent to which SNS use impacts the psychological well-being of cancer patients. Details of each paper are provided below.

1.5.1. Paper One: The use of social network sites and psychological well-being: a systematic review

Paper One is a systematic review of studies published between 2003 and 2014 that empirically tested the impact of SNSs use on individuals' psychological well-being, and reported factors that mediate this relationship. The paper also provides a review of definitions of SNSs and psychological well-being. This paper develops the groundwork for a general understanding of the relationship between SNS use and the psychological well-being of users. This review will help investigators set priorities for future research on SNSs and psychological well-being, and provides qualified encouragement to social and health services to use SNSs for enhancing users' psychological well-being.

The contribution of this paper to the thesis is that it provides a general understanding of the linkage between SNS and psychological well-being and serves as a foundation for more in-depth research designed to answer the research questions. The gaps in the literature showed two major weaknesses. The first was the insufficient theoretical justifications for the relationship between SNS use and psychological well-being. The second was the use of students as the study population. That is, less research attention has been paid to the less healthy people and people living with serious health conditions such as cancer-affected people who could (theoretically) benefit greatly from SNS.

1.5.2. Paper Two: Effects of Internet-based interventions on the psychological well-being of cancer-affected people: a systematic literature review

This paper provides a structured review of existing research on the effect of Internet-based interventions on the psychological well-being of cancer-affected people. It explains how the academic discussion on the effect of Internet-based interventions on the psychological well-being of users developed in the literature over time, identifies Internet-based interventions that have already been studied, the research methods that have been applied, the types of cancer-affected participants involved, the research results, and the areas needing further investigation. It provides evidence that Internet-based interventions can improve the psychological well-being of cancer-affected people.

The contribution of this paper is providing a general understanding of the linkage between a range of Internet-based interventions and the psychological well-being of cancer-affected people. The review revealed that while the effect of some dynamic health-related web-based applications (Web 2.0), such as blogs and forums, on the psychological well-being of cancer patients had been examined, little is known about the specific impact of SNS use on the psychological well-being of cancer-affected people. In addition, the paper showed that the theory behind online cancer support is poorly developed. This review also showed that studies published to date have focused overwhelmingly on women with breast cancer. This review helps investigators set priorities for future research on internet-based interventions such as SNSs for cancer-affected people.

1.5.3. Paper Three: The influence of health-specific social network site use on the psychological well-being of cancer-affected people

The aim of this paper was to examine how use of OCA Facebook affects the psychological well-being of cancer-affected people. Twenty-five women affected by ovarian cancer who were users of OCA Facebook participated in semi-structured qualitative interviews. Perceptive of Belongingness Theory, Sociocultural Theory, Social Support Theory and Social Presence Theory, was employed to guide the research and its findings. Results showed most interviewees used OCA Facebook daily. Some users were passive and only observed created contents; others actively posted content and communicated with other members. Analysis showed the use of OCA Facebook enhances social support, improves the experience of social connectedness, develops social presence and learning – and ultimately, improves psychological well-being. Based on the themes identified in the qualitative data, the author proposed a theoretical model of the relationship between the use of OCA Facebook and the psychological well-being of cancer-affected people. This theoretical model shows that OCA Facebook use is positively related to psychological well-being of cancer-affected people. This qualitative study provided insights into the lived experience of cancer patients' use of Facebook. The paper contributes through its presentation of a new understanding (a theoretical model – a primary aim of the research) of the way that SNS use is associated with the psychological well-being of cancer affected people. By clarifying this relationship, this study demonstrates that SNS use does indeed have possibilities for promoting the psychological well-being of cancer affected people, arguing for the sustainability of Internet-based interventions and showing the advantages of SNS use in patient healthcare. The findings

should encourage organisations involved in the care of cancer-affected people, and cancer patients themselves, to use Facebook to improve their psychological well-being.

1.5.4. Paper Four: The effect of Social Network Site use on the psychological well-being of cancer-affected people

Paper Four describes the work performed in testing the theoretical model defined in paper Three, and answers the research question “to what extent is Facebook use related to the psychological well-being of cancer-affected people?” In other words, paper Four aimed to empirically examine the extent to which SNS use impacts the psychological well-being of cancer-affected people. The survey was advertised on OCA Facebook, and 154 responses from cancer-affected members were collected and analysed. Factor analysis was used for testing questions loading on corresponding constructs and also for reliability and validity checks, and structural equation modelling was applied to estimate the relationship between constructs. This study applied Sobel test and showed that social support, learning, social connectedness and social presence mediate the relationship between Facebook use and the psychological well-being of cancer-affected people. This evidence will assist health organisations to generate strategies and make recommendations for using Facebook for improving the psychological well-being of their users.

The entire study, meaning the four papers collectively, contributes to the literature in terms of both theory and practice. Viewed through the lenses of Belongingness Theory, Sociocultural Theory, Social Support Theory and Social Presence Theory, this study showed a positive impact of SNS use on the psychological well-being of cancer-affected people. By clarifying this relationship, this study contributes to research on SNSs in two ways. First, it demonstrates conclusively that SNS use can promote psychological well-being, arguing for the

sustainability of Internet-based interventions and showing the advantages that SNS use can have in the context of healthcare, at least with respect to cancer-affected people.

Second, by developing a theoretical model, the research further illustrated the ways through which SNS use is positively related to the psychological well-being. The model that predicts Facebook use enhances reception of social support, experiences of social connectedness, development of social presence and learning – and ultimately, enhanced psychological well-being. The theoretical model improves understanding of the factors that mediate the positive impact of Facebook use on the psychological well-being of cancer-affected people.

This thesis developed and tested a multi-theory approach to hypothesis development and to frame interpretation of relationships between the use of SNSs such as Facebook and the psychological well-being of users, specifically cancer-affected people. A lack of theoretical underpinnings in previous studies in this area had been recognised (Guo et al., 2014; Hong et al. 2011), and this study has addressed this gap.

1.6 Defining terms and Keywords

Social Network Sites Social network sites (SNSs) are networked communication platforms in which users can create profiles and content, establish connections, develop interactions with their connection, share content and consume content provided by their networks (Berger et al., 2014; Ellison & Boyd, 2013).

Psychological well-being Psychological well-being is defined in the literature in terms of autonomy, personal growth, self-acceptance, life purpose, environmental mastery and positive relatedness (Ryff, 1989). Autonomy means being able to resist social pressures; personal growth refers to feelings of continued development; self-acceptance means holding positive attitudes toward oneself; life purpose is a sense of direction in life; environmental mastery is

about feeling competent in creating context suitable to personal needs and values; positive relatedness is the extent to which one forms satisfying relationship with others. Psychological well-being can also be conceptualised as feeling happy, capable, well supported and satisfied with life (Huppert, 2009; Moyer et al., 2014; Winefield, Gill, Taylor, & Pilkington, 2012).

Social support Shumaker and Brownell (1984) defined social support as “an exchange of resources between two individuals perceived by the provider or recipient to be intended to enhance the well-being of the recipient” (p.13).

Social connectedness Social connectedness is described as emotional connectedness and a sense of belonging between an individual and other people (Pearson et al., 2010), which forms through social connections and positive relationships (Abubakar et al., 2014).

Belongingness theory Belongingness theory as first posited by Baumeister and Leary (1995), which states individuals develop meaningful relationships to experience a sense of belonging and consequently experience greater psychological well-being.

Sociocultural Theory (SCT) Sociocultural Theory focuses its full attention on learning as a social process (Lantolf, 1994). While this theory is mainly informed by Vygotsky, he himself was unlikely to have ever used this term. The concept of regulation derives from sociocultural theory where learners are said to progress from other regulation to self-regulation. According to SCT successful learning involves moving from object and other regulation to self-regulation. Object regulation is the stage that learners' actions are determined by the object they encounter in environment, and start to learn by observation in social environment. Other regulation stage when learners learn by obtaining assistance and receiving feedback from peers

or mentors in a social environment. Self-regulation stage when learner becomes competent enough to perform independently.

Social presence Social presence is defined as the degree of salience of the other person in the interaction (Short et al., 1976), a sense of human contact and experience of others' presence in a social environment (Lee et al., 2009; Ning Shen & Khalifa, 2008; Biocca, & Burgoon, 2003).

Social Presence Theory (SPT) Social Presence Theory postulates that communication is effective if the medium has the social presence appropriate for the level of interpersonal involvement required for a task (Short et al., 1976).

CHAPTER 2 (PAPER ONE):

THE USE OF SOCIAL NETWORK SITES AND PSYCHOLOGICAL
WELL-BEING: A SYSTEMATIC REVIEW

*The rapid growth in the number of users of SNSs makes
it important to examine their impact on users and their
potential to improve psychological well-being
(Guo et al., 2014)*

Abstract

A systematic literature review has been conducted to lay the groundwork for understanding the relationship between the use of Social Network Sites (SNSs) and psychological well-being, and devising strategies for taking advantage of this relationship. The review included studies published between 2003 and 2014 that empirically tested the relationship between an individual's psychological well-being and their use of SNSs. Science Direct, Springer Link, IEEE Explore, Google Scholar, PsychInfo, Scopus and expert consultation were used to select 96 articles, ten of which met the selection criteria. Findings revealed a positive relationship between the use of SNSs and psychological well-being. This study revealed the existence of weak theoretical justifications for the relationship between SNS use and psychological well-being. It also found that most of previous studies have relied on student participants. Little is known about the impact of SNS use on psychological well-being of other cohorts of SNS users. This review will help investigators to set priorities for future research on SNSs and psychological well-being, and will encourage social and health services to use SNSs for enhancing users' psychological well-being

Keywords: Systematic literature review, Social Network Sites, psychological well-being

2.1 Introduction

Social Network Sites (SNSs) are networked communication platforms in which users can create profiles and content, establish connections, share content, develop interactions with their connections and consume content provided by their network [Ellison and Boyd., 2013; Berger et al., 2014].

SNSs have become a part of many peoples' daily practice and have attracted millions of people [Li, Chau, and Slyke, 2010; Hajli et al., 2014] and gained prominence as avenues for interactive communication, information search and community links [Shim, Decleva and Guo, 2011; Hu, Poston and Kettinger, 2011; Durst, Viol and Wickramasinghe, 2013; Ku, Chen and Zhang, 2013]. SNSs have become well established in modern individuals' lives [Bui and Honavar, 2015]; Internet users are increasingly inclined to merge some or all of their online activities through SNSs [Yu et al., 2010]. SNS users can perform numerous activities – such as blogging, emailing, instant messaging and photo sharing – on a single site such as Facebook [Erfani et al., 2013; Abedin and Jafarzadeh, 2015]. Facebook had counts for more than with 900 million active users in 2015 (eBizMBA, 2015) <http://www.ebizmba.com/> (last visited June 2015).

SNSs which many users spend hours using each week or even day [Junglas et al., 2013] have implications on users' psychological well-being [Grieve et al., 2013]. The rapid growth in the number of users of SNSs makes it important to understand the impact of SNS on users and their potential to improve users' psychological well-being [Guo, Li and Ito, 2014; Reinecke and Trepte, 2014]. However, to date little research attention has been paid to the impact of the use of SNSs on the psychological well-being of users and its role in promoting the psychological well-being [Grieve et al., 2013; Guo et al., 2014]. In order to develop the

groundwork for a general understanding of the relationship between SNS use and psychological well-being of users we conducted a formal systematic literature review of existing evidence about the potential ways that SNSs use can affect users' psychological well-being. Kitchenham et al. (2009)'s methodology was employed for summarizing and giving structure to evidence. This methodology includes planning the review, conducting the review and reporting the review, and enabled us to present a rational evaluation of the research topic. The study argument in this paper is built on uses and gratification theory (UGT), which suggests people intentionally choose a technology with a use associated with obtaining gratification such as greater psychological well-being [Katz, 1959]. Based on this theory, it is assumed that people would ignore SNSs if SNS use had negative impact on their psychological wellbeing.

The remainder of this paper is organised as follows. Section 2.2 presents an overview of SNSs, Section 2.3 presents a summary of psychological well-being definitions, Section 2.4 describes the methods applied in this systematic literature review, and Section 2.5 is the recommendation for future research, and the paper's conclusions are outlined in section 2.6.

2.2 An overview of Social Network Sites

Social networks have existed since modern humans arose 200,000 years ago. The first known mention of "Social network" concept was 400 years before Christ, when the Greek philosopher Aristotle described human beings as "zoon politicon", a character with essential need to build communities [Heidemann, Klier and Probst, 2012,p.2]. World Wide Web (WWW) and development of Web 2.0 marked the beginning of a new era for social networking [Zhang, Zhai, Liu, and Stevenson, 2015].

With the advent of Web 2.0, the second generation, more personalized and communicative form of the World Wide Web [Huang, Kuang, and Güney, 2012; Kim et al., 2009; Sykes, Oskoz and Thorne 2013], SNSs became popular channels for online interaction [Chen, Rui, Sharma and Sushil, 2013]. The first recognizable SNS, SixDegrees, was launched in 1997; MySpace emerged in 2003, followed by Facebook in 2004 [Berger et al., 2014]. The popularity and social and economic significance of SNSs is surging, and SNS research is growing accordingly.

Social Network Sites are user-oriented sites [Smith, Fischer and Yongjian, 2012; Probst, Grosswiele and Pflieger, 2013]. SNSs have the capability to foster informational and emotional exchange [Ellison and Boyd, 2013; Berger et al., 2014; Pan et al., 2015; Lin, Hsu, Cheng and Chiu, 2015; Utz, 2015]. SNSs enable their users to use messaging functionalities such as private messages and chat services to develop communication [Heidemann et al., 2012]. Within Facebook, for example, users can develop aural and visual communication [Burke, Kraut and Marlow 2011; Erfani, Abedin and Daneshgar, 2013a; Petrocchi et al., 2015]. In the course of information dissemination, SNS such as Facebook allow users to create content on their own message board, which is called a “wall”, or post content to another user’s wall [Burke et al., 2010]. Moreover, Facebook users can distribute wall posts through their networks via information distribution functionalities such as “share” with only a single click. On SNS, Facebook, users can “tag photos” [Wisniewski, Xu, Lipford and Bello, 2015] and “mention friends in comment” and thereby send content into the news feeds of their friends, and create comment directly below the posted content or endorse content by “liking” it [Heidemann et al., 2012, p.2]. SNSs are accessible through different communication platforms such as mobile phones [Xu, Ryan, Prybutok and Wen, 2012].

Several parallel terms exist in the literature for SNSs, such as social networking service, online social network, social networking sites, and Virtual Social Networks. Table 2.1 lists terms that have been used synonymously for SNS.

Table 2.1: SNS definitions

Term	Author	Definition
Social networking service	Adamic and Adar (2005)	Social networking services gather information on users' social contacts, construct a large interconnected social network, and reveal to users how they are connected to others in the network
Social network sites	Ellison (2007)	Social network sites are web-based services which allow individuals to create profiles, lists of contact management with which it is possible to exchange all sorts of information, navigate through one's own list of contacts and that of other users
Social network service	Riordan, Adam, and O'Reilly (2009)	A social network service is a shared, interactive, immersive environment in which participants can communicate, collaborate, and trade with each other
Online social network	Schneider, Feldmann, Krishnamurthy and Willinger.(2009) Heidemann et al., 2012	Online social network form online communities among people with common interests, activities, backgrounds, and/or friendships. Most OSNs are web-based and allow users to upload profiles (text, images, and videos) and interact with others in numerous ways
Virtual Social Networks (VSNs)	Quinio and Marciniak (2013)	Online environments which offer their users three large categories of functionality: (1) self-representation, (2) creation, modification and sharing of digital contents, (3) user interaction via profiles or contents created by users or VSN designers
Online Social Network	Ellison and Boyd (2013)	A networked communication medium in which participants have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and/or system-level data, can publicly articulate connections that can be viewed and transferred by others; and can consume, produce, and/or interact with streams of user-generated content provided by their connections on the site

While the in the literature of social media, several terms, such as online social networks or computer based social networks have been used interchangeably for SNSs, this study will use SNSs for consistency purposes. In this study, SNSs have been defined as networked communication platforms in which users can create profiles and content, establish

connections, share information, develop interactions with their connections, and consume content provided by their network members.

2.2.1 History and development of Social Network Sites

Numerous SNSs have been launched in the last decade. Some of them are well established and highly popular, such as Facebook. Some early networks (such as Friendster) failed due to technical and social issues [Ellison and Boyd, 2013], but nonetheless built the foundation for the success of subsequent SNSs. A perspective on the origin and development of the SNS phenomenon is presented in the following paragraphs.

The Initial Years of Social Network Sites (1997–2002)

The first recognizable SNS, SixDegrees, was launched in 1997. Six Degrees allowed users to create profiles, list their friends and send messages to them. While SixDegrees attracted a million registered users, it failed in 2000 due to the poor development of the online advertising industry [Ellison and Boyd, 2007]. In the following years AsianAvenue, Black-Planet, MiGente and LiveJournal were launched, sites primarily focused on combining various technical functionalities such as creating lists of friends and dating profiles. In 2001, the first business SNS, Ryze, was created to link business professionals, but proved not to be a sustainable SNS and didn't experience great popularity [Ellison et al., 2007]. In 2002, Friendster was designed to set up access of friends-of-friends. However, Friendster soon lost many of its users due to its inability to handle rapid growth in user numbers [Heidemann et al., 2012].

The Maturation and Popularity of Social Network Sites (2003–Present)

From 2003 ahead, several new SNSs were emerged, prompting social software analyst Clay Shirky (2003) to coin the term YASNS: “Yet another Social Networking Service”. MySpace

was launched in California in 2003 and attracted substantial media attention. MySpace focused on attracting unsatisfied users of Friendster, and became popular very rapidly [Heidemann et al., 2012]. In the following years, a new wave of SNSs was launched focusing on special interests. For example, professional sites such as XING and LinkedIn were designed to connect businesspeople. In addition, a few SNSs such as SmallWorld (an elite site), Couchsurfing (an activity-centred site) and MyChurch (a religion-focused site) tried to gain a competitive advantage by targeting specific groups. Mark Zuckerberg launched Facebook in 2004 [Ellison and Boyd, 2013], primarily as a Harvard-only SNS, but today it is the most popular SNS [Berger et al., 2014]. From 2005 onwards, access to Facebook was possible for students from other schools and it became open to a broader membership. Facebook and other successful SNSs such as MySpace, StudiVZ (Germany), Hyves (The Netherlands), Renren (Asia) and Orkut (Brazil) attracted millions of people and began to generate increasing interest among investors.

Most SNSs have struggled to construct a sustainable business model. Some reinvented themselves; for example, Friendster moved from friendship SNSs to a social entertainment and gaming site, and grew to have more than 100 million users in 2011 [Wilson, Gosling and Graham 2012]. In contrast, some SNSs (such as AOL) were unable to build sustainable businesses and folded [Heidemann et al., 2012]. Facebook is the most popular SNS, forecast of Facebook's worldwide mobile advertising revenue in 2016 is \$3,840.5m. (Statista, 2015) <http://www.statista.com> (last visited September 2015).

2.2.2 Information Systems Studies of Social Network Sites

Over the last decade SNSs research has been a topic that has developed in a number of areas.

A review of the literature in this thesis has grouped previous SNSs studies in four groups:

- The characteristics of SNSs, including: origin and development [Heidemann et al., 2012; Wilson, Gosling and Graham, 2012], type and structures [Heidemann et al., 2010; Wigand, Wood and Mande, 2010; Wilson et al., 2011; Quinio and Marciniak, 2013].
- The characteristics of users of SNSs, such as: motivations and intentions [Maier et al., 2011; Hu, Potson and Kettinger, 2011; Xu et al., 2012; Ku, Chen and Zhang, 2007; Huang et al., 2014; Pan et al., 2015], behaviour [Guo, Shim, Luo, and Gurung, 2011], and interaction and communication [Wilson et al., 2012; Ng et al., 2013].
- Functionalities of SNSs for organizational purposes, such as using SNSs for generating new ideas and developing new products [Jain, 2010], improving customer services [Storni and Griffin, 2009], recruiting business professionals [Garg and Telang, 2012; Pike, Bateman and Butler, 2012], and fostering collaboration, communication, and knowledge management [Aral and Godes, 2013; Berger et al., 2014].
- Functionalities of SNSs for societal purposes, such as for teaching purposes [Shim et al., 2011; Magro et al., 2012], for political purposes [Misiolek and Wozencroft, 2010; Maghrabi and Salam, 2013], social interaction and social presence [Xu et al., 2012; Von Krogh, 2012; Pan et al., 2015], emergency management [Albert and Salam, 2012; Demetz, Heinrich and Klier, 2011; Babu and Singh, 2013].

2.3 A summary of psychological well-being definitions

Well-being refers to “optimal experience and functioning” [Deci and Ryan, 2001, p.142]. Research on well-being has been aligned with two general viewpoints: hedonic view and eudemonic view.

The first perspective, hedonic view, defines well-being in terms of happiness and experience of pleasure [Kubovy, 1999]. The dominant view among hedonism is that well-being consists of subjective happiness and pleasure. Research in the hedonic psychology has used the component of subjective well-being including life satisfaction, the presence of positive mood, and the absence of negative mood to evaluate the pleasure and happiness [Diener, Oishi, and Lucas, 2003].

The eudemonic view considers well-being more than just happiness; it focuses on living in an extremely satisfying way [Deci and Ryan, 2001]. Some philosophers (religious masters) have denigrated happiness as the only concept of well-being [Waterman, 1993]. Aristotle, for example suggested true well-being is found in the expression of doing what is worth doing [Deci and Ryan, 2001]. Drawing on Aristotle’s argument, Ryff and Keyes (1995) defined psychological well-being in terms of autonomy, personal growth, self-acceptance, life purpose, mastery, and positive relatedness, which promotes emotional health. Autonomy means being able to resist social pressures; personal growth refers to feelings of continued development; self-acceptance means holding positive attitudes toward oneself; life purpose is a sense of direction in life; environmental mastery is about feeling competent in creating context suitable to personal needs and values; positive relatedness is the extent to which one forms satisfying relationship with others. [Diener and Lucas 1999, p5]. Several conceptual terms such as happiness [Chou and Lee, 2010] and life satisfaction [Winefield, Gill, Taylor

and Pilkington, 2012] have been used to measure psychological well-being. Also, there are several operational definitions of psychological well-being in the literature. Table 2.2 provides a list of some of the most cited definitions of psychological well-being.

Table 2.2: Psychological well-being definitions

Authors	Definition
Deci and Ryan, 2008	Psychological well-being is explained as mixture of positive states such as happiness and effective social functioning.
Huppert, 2009	Psychological well-being is about lives going well. It is the combination of feeling good and functioning effectively.
Winefield et al., 2012	Psychological well-being is conceptualised as feeling happy, capable, well supported, and satisfied with life.
Schreiber and Brockopp, 2012	Psychological well-being is defined as a positive state reflected in measures of adjustment, mental well-being, and positive attitude
Ryff and Keyes,1995	Psychological well-being is about self-acceptance, personal growth, relatedness, autonomy, relationships, environmental mastery, and purpose in life.

Research in Information Systems has previously stressed SNSs’ capabilities in fostering informational and emotional exchange, knowledge sharing and the development of extensive supportive interactions [Erfani, Abedin and Daneshgar,2013b; McKeen and Smith, 2007; Pan et al., 2015; Utz, 2015], which are predictors of a greater psychological well-being [liu, Xiao and Feldman, 2014; Oh, Ozkaya, and LaRose, 2014]. While the use of SNSs is increasingly growing [Ellison and Boyd, 2013] more work is still needed for clear recommendations about how the use of SNSs may promote psychological well-being of people [Guo et al., 2014; Reinecke and Trepte, 2014]. Hence we have conducted this systematic literature review to collect existing evidence on SNSs use and psychological well-being, and to provide evidence-based guidelines for Information Systems researchers and practitioners. The next section

explains the method used in this article for conducting this systematic literature review for achieving the above objective.

2.4 Method

The purpose of a systematic review is to present a rational evaluation of a research topic by using a reliable and auditable methodology. Systematic literature review tries to identify, assess, and interpret available empirical studies [Kitchenham, 2010]. A systematic literature review is different from ordinary literature review, as a systematic literature review has different types of scientific values and is formally scheduled and planned to be independently replicable [Kitchenham et al., 2009]. Kitchenham identified three main steps for conducting systematic literature review: planning the review, conducting the review, and reporting the review. This study adopted Kitchenham's methodology that is a reliable and widely cited methodology [Kitchenham et al., 2009]. Each phase has several steps that are described in details in the following paragraphs.

2.4.1 Planning the review

The first step was formulating the research questions. Seeking to understand the relationship between Internet use and users' psychological well-being is not a new idea [Nabi, Prestin and So, 2013]; researchers have been interested in the relation between Internet use and the psychological well-being of users since 1993 that the Internet was introduced to public [Ellison, Steinfield and Lampe, 2007]. However, despite the widespread use of SNSs, little attention has been paid to the impact of SNSs use on users' psychological well-being of users [Guo et al., 2014; Reinecke and Trepte, 2014]. Accordingly, the present study was designed to explore what the research literature tells us about the use of SNSs and psychological well-being of users. The aim of undertaking a systematic literature review is not only collecting all

existing evidence on a research question but also providing an evidence-based guideline for practitioners [Kitchenham et al., 2009]. Therefore, a number of secondary research questions have been used in this paper to more specifically address each aspect of the relation between SNS use and well-being. The contribution of this paper to the thesis is that it provides a general understanding of the linkage between SNS and psychological well-being and serves as a foundation for more in-depth research designed to answer the research questions in the thesis.

Thus, this systematic literature review answers the following questions:

SRQ1: How have the academic discussions on the use of SNSs and users' psychological well-being been developed in the literature over time, and what SNSs have been studied?

SRQ2: Which variables have been used to measure the use of SNSs and psychological well-being?

SRQ3: Which research methods and theories were have been used in previous studies?

SRQ4: How have SNSs use been related to the users' psychological well-being?

The second step in planning the review was developing a protocol to decrease the possibility of researcher bias. We developed a protocol that encompassed search strategy, process for selection of relevant studies, study selection criteria (inclusion and exclusion criteria), as well as data extraction strategy to address research questions in this paper. Three independent experts with expertise in conducting systematic literature reviews assessed the protocol and any ambiguities in the protocol were rectified. Search terms were created, starting with two broad search terms: "Social Network Sites" and "psychological well-being". Secondary search terms were "Facebook", "happiness", "positive affect", "life satisfaction." Table 2.3 overviews show our search strategy.

Table 2.3. Overview of the Search Strategy

Time period	2003-2014
Search terms	“Social Network Sites”, “psychological well-being”, “Facebook”, “happiness”, “positive affect”, “life satisfaction”.
Search fields	Title, abstract, keywords

2.4.2 Conducting the review

After selecting search terms, as the first step, an inductive search was conducted in following major electronic databases: Science Direct, Springer Link, IEEE Explore, Psych Info and Google Scholar. In addition, a manual search of specific Information Systems conference proceedings and journal articles was conducted. In order to include the field’s leading journals in our literature search we referred to journal rankings provided by Association for Information Systems (AIS) and included high-quality journals. Studies published between 2003 and 2014 are considered in this article, as from 2003 onward, many new SNSs were launched [Ellison et al., 2007]. This search initially identified 96 articles. Table 2.4 overviews the selected sources for our literature search.

Table 2.4: Selected Electronic databases, Journals and Conferences

Electronic databases	Science Direct, Springer Link, IEEE Explore, Psych Info and Google Scholar
Journals	ACM Transactions on Computer-Human Interactions, Decision Support Systems, European Journal of Information Systems, Information and Management, Information and Organization, Information Systems Research, MIS Quarterly, Communications of the Association for Information Systems, Information Systems Frontiers, Journal of the American Medical Informatics Association, The Information Society.
Conferences	Australasian Conference on Information Systems, Americas Conference on Information Systems. European Conference on Information Systems, Hawaii International Conference on System Sciences International Conference on Information Systems, International Conference on Information Systems Development, Pacific Asia Conference on Information.

The second step was to filter the relevant studies from the initial pool of 96 articles. Studies were included if they (1) empirically tested the relationship between SNS use and psychological well-being and reported the factors that mediates this relation (2) were peer-reviewed articles published before December 2014. The exclusion criteria were (1) descriptive studies that did not report empirical relation between the use of SNS and psychological well-being, (2) studies that did not focus on SNSs (e.g., focused either on internet in general or other Web 2.0 applications such as Blogs and micro blogging sites like twitter), (3) studies on physical well-being (4) and studies that did not specify how SNS use could be related to

psychological well-being and only focused on main effect of SNS use on psychological well-being.

Abstracts of all 96 articles were reviewed. Using the exclusion criteria, 75 studies were removed, leaving 21 articles. The full texts of the 21 remaining articles were reviewed carefully and inclusion criteria used to filter the most relevant articles. This resulted in 9 articles. A deductive search was conducted by reviewing the nine articles' reference lists, producing 1 additional article. Figure 2.1 illustrates the procedure of literature search and selection.

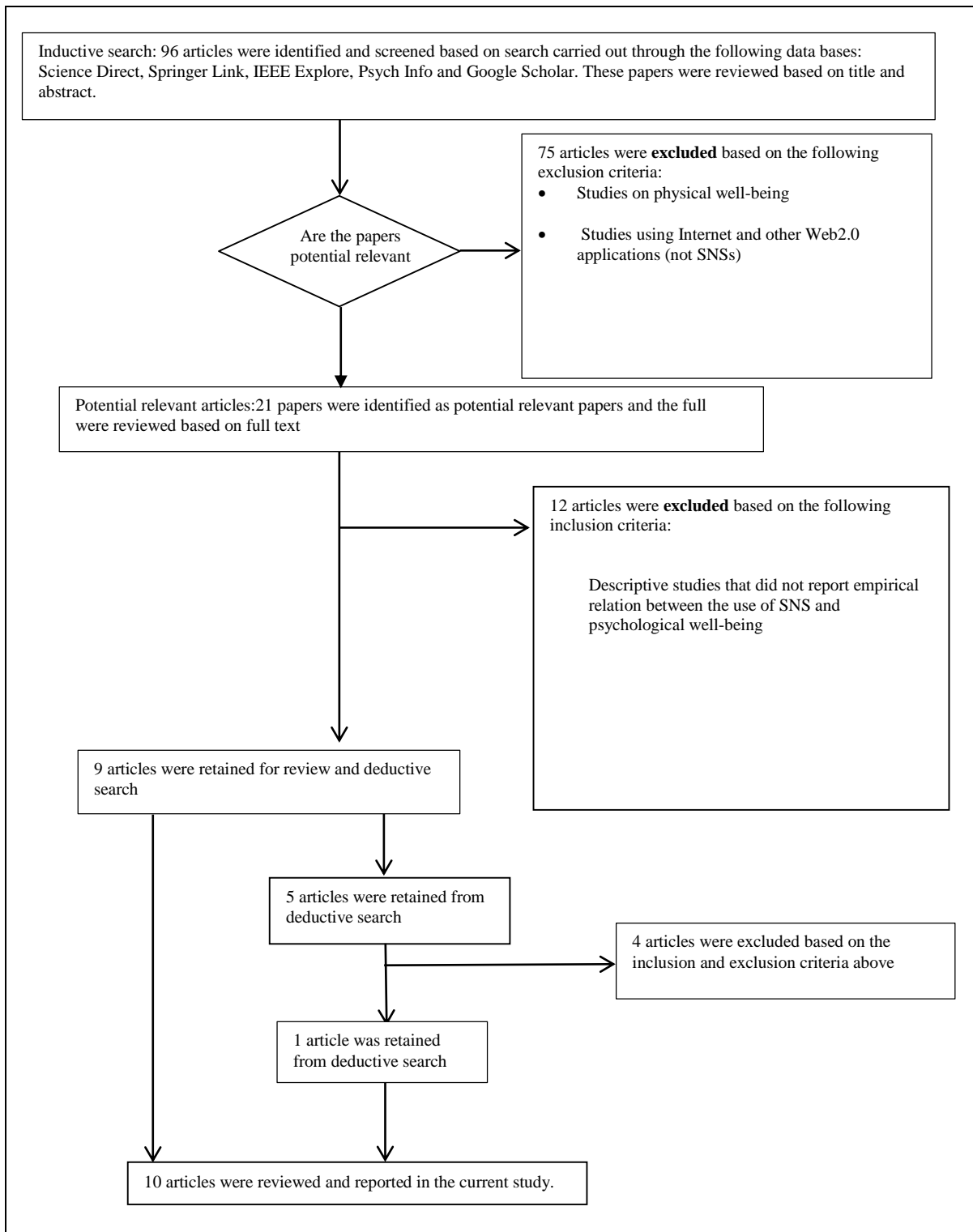


Figure 2.1. Flowchart of the systematic literature search

The third step was data extraction and synthesis. In this step extraction forms were developed to effectively summarize the methods and findings from each of the ten chosen studies. Data extraction forms included the following items: the source of article (journal or conference) with full reference, type of SNS (e.g. Facebook), theories and research methods, study population and characteristics of research participants, and mechanisms through which SNS use was related to psychological well-being. Data was extracted by one of the researchers and checked by another, and when there was a disagreement the issue was discussed until agreement was reached.

2.4.3 Reporting the review

SRQ1: How have the academic discussions on the use of SNSs and users' psychological well-being been developed in the literature over time, and what SNSs have been studied?

Table 2.5 shows articles that have studies the relationship between the use of SNSs and users' psychological well-being.

Table 2.5: SNS use and psychological well-being studies

Study	Author(s)	Year	Country	Journal/Conference Proceedings
S1	Valkenburg , Peter and Schouten	2006	Netherland	Cyberpsychology, Behavior, and Social Networking
S2	Valenzuela , Park and Kee	2009	USA	Computer mediated communication
S3	Burke et al	2010	USA	Conference on human factors in computing systems
S4	Manago and Greenfield	2012	USA	Developmental psychology
S5	Liu and Yu	2013	Taiwan	Cyberpsychology, Behavior, and Social Networking
S6	Apaolaza et al	2013	Spain	Computers in human behaviour
S7	Nabi et al	2013	USA	Cyberpsychology, Behavior, and Social Networking
S8	Guo et al	2014	Japan	Cyberpsychology, Behavior, and Social Networking
S9	Reinecke and Trepte	2014	Germany	Computers in human behaviour
S10	Oh et al	2014	USA	Computers in human behaviour

To gain insights into how the academic discussion on SNS use and psychological well-being has developed in the literature over time, we first analyzed the number of articles published from 2003 onwards. While we looked for articles published from 2003, Valkenburg et al., (2006) was the earliest study that explicitly investigated the relationship between the use of SNSs and users' psychological well-being. This shows research on SNS use and psychological well-being is relatively young research field. After 2006 there has been a gradual increase in the number of studies in this field (see Figure 2.2).The continues growing number of

publications shows that the research on the use of SNS and users' psychological well-being has become more established in recent years.

Cyberpsychology, Behavior, and Social Networking, and Computers in Human Behaviour were most receptive journals to research on the use of SNS and experiencing greater psychological well-being.

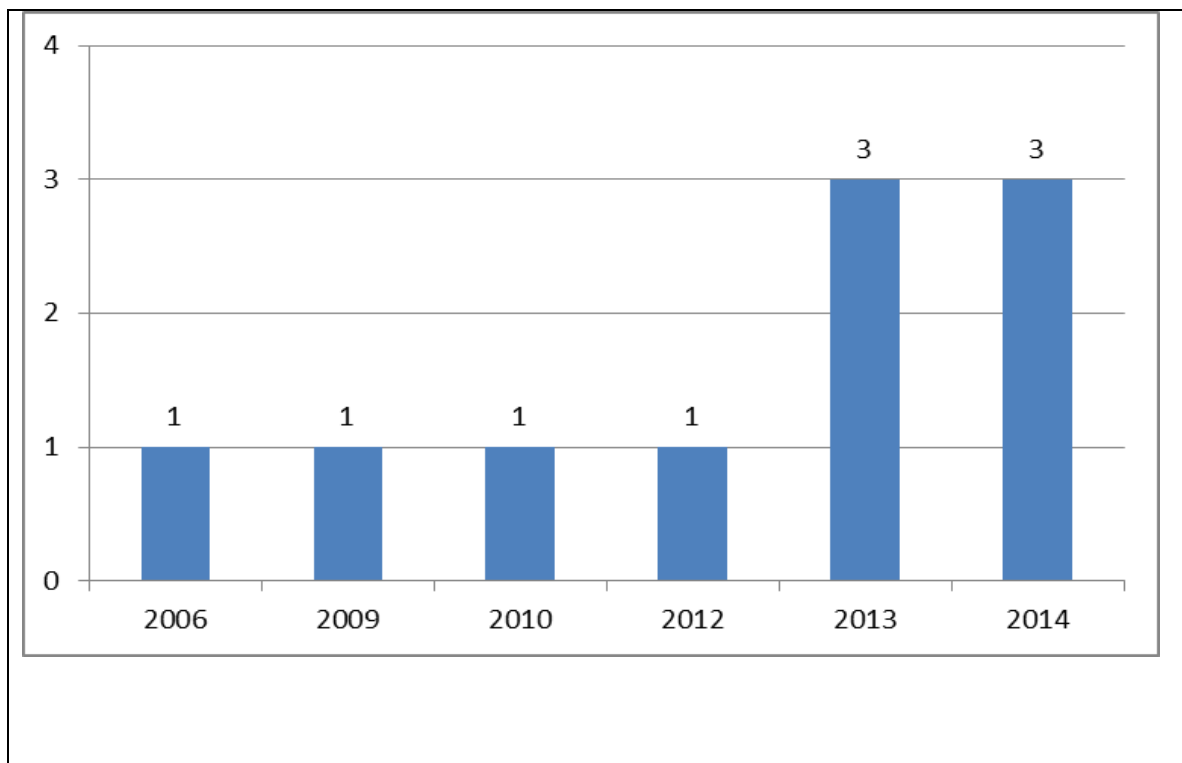


Figure 2.2. Number of articles on the use of SNSs and psychological well-being per year

Five of the studies were conducted in the USA [Valenzuela et al., 2009; Burke et al., 2010; Manago and Greenfield et al., 2012; Nabi et al., 2013; Oh et al., 2014], and the remainder in the Netherlands, Spain, Germany, Japan and Taiwan.

Not surprisingly, most of these studies (n=7) investigated Facebook (Table 2.6). The remaining studies used platforms such as the Dutch Social Network Site (CU2), Spanish Social

Network Site (Tuenti), Mixi, StudiVZ, My space, Cyworld [Valkenburg et al., 2006; Apaolaza et al., 2013; Guo et al., 2014; Reinecke and Trepte, 2014; Oh et al., 2014]. It is important to note that most of these articles (n=9) used students as their sampler. As the pattern of the use of SNSs amongst different generations may be different, leading to different impact on their psychological well-being. This shows a need for considering other cohorts of SNS users.

Table 2.6: Sample, population and type of applied SNSs in reviewed articles

Study	Author	Recruitment and sampling	Type of SNS
S1	Valkenburg et al(2006)	881 adolescents (10-19)years old Participants were via links posted to CU2	Dutch Social Network Site (CU2)
S2	Valenzuela et al(2009)	2603 college students(18-29) years old Participants were recruited randomly through students email list	Facebook
S3	Burke et al(2010)	1193 Adults Participants were recruited via links posted on Facebook	Facebook
S4	Manago and Greenfield(2012)	88 college students Participants were recruited from enrolled students	Facebook
S5	Liu and Yu(2013)	330 college students convenience sample consisting of college students	Facebook
S6	Apaolaza et al(2013)	344 school students Participants were recruited via links posted to Tuenti	Spanish Social Network Site (Tuenti)
S7	Nabi et al(2013)	401 undergraduate students Participants were recruited via links posted on Facebook	Facebook
S8	Guo et al(2014)	142 Chinese internationals students posting links to online communities and instant messaging of Chicness international students	WeiboRenren, Facebook Mixi
S9	Reinecke and Trepte (2014)	374 students Participants were recruited via links posted on Facebook and StudiVZ	Facebook and StudiVZ
S10	Oh et al(2014)	339 Undergraduate students Participants were recruited using a snowball sampling technique	Facebook, My space, Cyworld

SRQ2: Which variables have been used to measure the use of SNSs and psychological well-being?

In the ten reviewed articles, SNS use has been measured by frequency of use, rate of use, intensity of use, history of use, frequency of replies, and number of friends. Psychological well-being was measured by life satisfaction, positive affect, absence of negative affect, autonomy, environmental mastery, personal growth, positive relations with others, purpose in life and self-acceptance. Table 2.7 shows measure applied for SNS use and psychological well-being in reviewed articles.

Table 2.7: SNSs use and psychological well-being measures

Study	Title of article	SNS use measures	Psychological Well-being measures
S1	Friend networking sites and their relationship to Adolescents' well-being and social self-Esteem	Frequency,Rate Intensity of use	Life Satisfaction
S2	Is There Social Capital in a Social Network Site? Facebook Use and College Students' Life Satisfaction	Intensity of use	Life satisfaction
S3	Social network activity and social well-being	Intensity of use	loneliness
S4	Me and my 400 friends: the anatomy of college students' Facebook networks, their communication patterns, and psychological well-being.	Network size Frequency of use	Life satisfaction
S5	Can Facebook use induce psychological well-being?	Intensity of use	Autonomy,Environmental mastery, Personal growth, Positive relations with others,Purpose in life , Self-acceptance
S6	The relationship between socializing on the Spanish online networking site Tuenti and teenagers' subjective psychological well-being: The roles of self-esteem and loneliness	Intensity of use	Life satisfaction
S7	Facebook Friends with (Health) Benefits? Exploring Social Network Site Use and Perceptions of Social Support, Stress, and Psychological well-being.	History of use Network size	Life satisfaction
S8	Exploring the Predicted Effect of Social Networking Site Use on Perceived Social Capital and Psychological Psychological well-being of Chinese International Students in Japan	Amount of time Frequency of reply	Life satisfaction
S9	Authenticity and psychological well-being on social network sites: A two-wave longitudinal study on the effects of online authenticity and the positivity bias in SNS communication.	Intensity of use	Positive affect Absence of negative affect Life satisfaction
S10	How does online social networking enhance life satisfaction? The relationships among online supportive interaction, affect, perceived social support, sense of community, and life satisfaction	Number of friends Frequency of use History of use	Life satisfaction

SRQ3: Which research methods and theories have been used in previous studies ?

Majority of reviewed studies (n=8) used a cross-sectional design and only two studies applied a longitudinal approach, which involved pre and post-test investigations [Reinecke and Trepte, 2014; Oh et al., 2014]. As it can be seen from table 2.8, most of articles (n=6) did not follow a theoretical perspective to explain the relation between SNSs and users' psychological well-being that shows a lack of use of relevant theoretical support for the studies that have been published in this area. Exceptions were articles that applied self- esteem theories [Valkenburg et al., 2006; Apaolaza et al., 2013], social change and human development theory [Manago and Greenfield, 2012], and theory of stress [Nabi et al., 2013].

Table 2.8: Research methods and theories applied SNSs in reviewed articles

Study	Author	Data Collection	Data analysis	Applied theories
S1	Valkenburg et al(2006)	Online survey	Structural Equation Modeling (AMOS software)	Self-esteem theories
S2	Valenzuela et al(2009)	Online survey	Statistical analysis	Theoretical perspective was not followed
S3	Burke et al(2010)	Online survey	Statistical Analysis (OLS)	Theoretical perspective was not followed
S4	Manago and Greenfield(2012)	Online survey	Path analysis	Social change and human development
S5	Liu and Yu(2013)	Survey	Structural Equation Modeling (Smart PLS software)	Theoretical perspective was not followed
S6	Apaolaza et al(2013)	Survey	Structural Equation Modeling (AMOS software)	Self-esteem theories
S7	Nabi et al(2013)	Online survey	Path analysis	Theory of stress
S8	Guo et al(2014)	Online and hard copy survey	Multiple regressions	Theoretical perspective was not followed
S9	Reinecke and Trepte (2014)	Survey	Structural Equation Modeling (AMOS software)	Theoretical perspective was not addressed
S10	Oh et al(2014)	Momentary sampling	Structural Equation Modeling (AMOS software)	Theoretical perspective was not followed

SRQ4. How have SNSs use been related to the users' psychological well-being?

The results from the ten reviewed articles showed that the use of SNSs can enhance users' psychological well-being through: fostering authentic self-presentation, developing social capital, enhancing reception of social support and perceived social support as well as promoting social self-esteem. The following paragraphs provide more details.

Social support and perceived online social support. Shumaker and Brownell (1984) defined social support as “an exchange of resources between two individuals perceived by the provider or recipient to be intended to enhance the well-being of the recipient” (p.13). Perceived social support emphasizes on an individual's views about whether or not members of one's social network offer support [Cohen et al., 1985]. Perceived online social support has been reported as an outcome of the use of SNS, which leads to greater psychological well-being among students [Manago and Greenfield 2012; Nabi et al., 2013; Oh et al. 2014]. Nabi et al. (2013) examined the relation between students' psychological well-being and their use of Facebook. Their online survey found that the total number of Facebook friends among undergraduate Facebook users was linked to perception of perceived social support, which in turn was associated with higher life satisfaction. Manago and Greenfield (2012) used an online survey to examine the socialization context of Facebook during the transition to adulthood. Their finding suggested Facebook as a useful tool for experiencing more perceived social support and consequently greater psychological well-being in terms of life satisfaction. Oh et al. (2014) examined the effect of SNSs use on the psychological well-being of undergraduate students in a media research course at a major Midwestern university, and their study showed positive associations among the number of SNS friends, developing more supportive interactions and respectively more perceived social support and greater life satisfaction.

Liu and Yu(2013) examined the relationship between the use of Facebook and psychological well-being of students and reported a positive relation that was mediated through social support, and they found the use of Facebook helped college students to obtain online social support which is an extension of general social support. Liu and Yu(2013) explained that online social support includes emotional, informational, and companionship support and general social support includes emotional, informational, companionship, and tangible support.

Social capital. Findings of the reviewed articles have shown that social capital, is achieved through the use of SNSs and is associated with a greater level of psychological well-being [Valenzuela et al., 2009; Guo et al., 2014]. Social capital including bonding social capital and bridging social capital, refers to resources available through networks [Durst et al.,2013; Ellison et al., 2007]. Bonding social capital refers to resources that can provide support which enables members to meet their emotional needs, and reflects strong tie networks. Bridging social capital refers to acquaintances that provide informational support to members, and reflects weak tie networks [Johnston et al., 2013; Erfani and Abedin, 2014].

Guo et al. (2014) investigated the consequences of SNS use by Chinese students in Japan and showed the use of SNS – in particular for social and information purposes – was related to greater perceived bridging social capital, and consequently increased levels of psychological well-being in terms of life satisfaction. Survey based findings from study conducted by Bruke et al. (2010) showed a positive relation between direct use of SNSs(directed communication) and bonding social capital, which consequently leads to a greater feeling of social and psychological well-being among adult Facebook users. Burke et al. (2010) explained directed communication in SNS includes posting, chatting and photo tagging.

Social self-esteem. Self-esteem also has been identified as a way through which the use of SNSs is positively related to psychological well-being [Valkenburg et al., 2006; Vanessa et al., 2013]. Apaolaza et al. (2013) proposed self-esteem as a mechanism that connects the use of SNS to experiencing greater psychological well-being. Apaolaza et al. (2013) collected data using a self-administered questionnaire in three Spanish education centers and investigated the influence of a Spanish SNS, Tuenti, on the psychological well-being of Spanish adolescents. Their study showed that the frequency of SNS use, socializing on Tuenti, was positively related to self-esteem and consequently had a positive influence on teenagers' perceptions of greater psychological well-being. Valkenburg et al. (2006) detected frequency of the use of SNS for communication purposes was correlated with developing interpersonal relationships and receiving positive feedback which increased adolescents' social self-esteem, and in turn life satisfaction [Valkenburg et al., 2006].

Authentic self-presentation. Authentic self-presentation is the unobstructed operation of one's true self. Reinecke et al. (2014) came to conclusion that SNSs enable their users to enact authentic behavior due to a great variety of features such as status updates, photo sharing and links to external online content, all of which promotes psychological well-being. Reinecke et al. (2014) recruited participants via links posted on Facebook and StudiVZ and collected data in a two-wave online panel survey. They provided longitudinal evidence for the beneficial effects of SNSs in increasing authenticity and hence psychological well-being in terms of positive affect, the absence of negative affect and life satisfaction.

2.5. Recommendations for future studies

Broadening the samplers from students to other cohorts of SNSs users

Most of the published studies in the SNSs literature and psychological well-being have heavily relied on healthy students and adolescents as their sources of data, and therefore have ignored or have paid less attention to other cohorts of users. However, such unbalanced ratios in the existing literature could lead to difficulty in generalising the findings to other cohort of SNS users [Burke et al.,2011]. SNSs are increasingly being used by people with mobility issues or people who use the Internet for obtaining health-related information and emotional support such as cancer-affected people [Bender et al., 2011]. Future researchers are therefore encouraged to understand the impact of SNS use on the psychological well-being of other users, such as elderly people, people with reduced mobility and/or those living with serious health condition and chronic disease, or people living in remote areas .

Developing theoretical justification for the proposed relationship between the use of SNS and users' psychological well-being

Research on the theoretical underpinnings of the relationship between the use of SNSs and users' psychological well-being is scarce. Future research is needed to develop new theories or to examine appropriateness of existing theories for explaining the consequences of the use of SNSs on psychological well-being of various groups of users. For instance potential theory for explaining the role of SNSs use and psychological well-being is Belongingness Theory, according to which individuals develop meaningful relationships and supportive interaction in order to experience a sense of connectedness and consequently experience greater psychological well-being [Baumeister and Leary, 1995]. Another potential theory for explaining the role of SNS use and psychological well-being can be Sociocultural Theory

(SCT). Sociocultural Theory focuses its full attention on learning as a social process (Lantolf, 1994). The concept of regulation derives from sociocultural theory where learners are said to progress from other regulation to self-regulation. According to SCT successful learning involves moving from object and other regulation to self-regulation. Object regulation is the stage that learners' start to learn by the object they observe in a social environment. Other regulation stage is when learners start to learn by obtaining assistance and receiving feedback from peers or mentors in a social environment. Self-regulation stage when learner becomes competent enough to perform independently. SNSs provide the opportunity for users to observe interactions in social environment as well as develop interactions with others and achieve assistance [Heidemann et al., 2012; Berger et al., 2014], therefore SCT is appropriate for understanding how SNSs use is associated with users' psychological well-being.

Conducting Longitudinal investigations of users' well-being on SNSs

Most of the reviewed articles were cross-sectional studies, hence were unable to show the long-term impact of the use of SNSs on individuals' psychological well-being or determine causality, which is the main advantage of longitudinal research. Future studies are encouraged to employ evaluation designs with a long-term follow-up approach that deters the demonstration of long-term effect of SNS use. More studies are needed to apply a longitudinal study in order to improve the observation and understanding of SNSs users' behavior and the impact of the use of SNSs on users' psychological well-being.

Improving sample size and measurement

larger sample sizes are recommended for investigating the use of SNS and its effect on users' psychological well-being, as our findings show many studies either have used small sample sizes or have not used pilot studies. A larger sample size has been recommended for

conducting more rigorous studies in this area [Hume and Sullivan, 2012], as different people may demonstrate different perceptions about SNSs and their impact on their psychological well-being.

Another shortcoming was that most of reviewed studies did not provide distinction between different function of SNS use (information search, communication, entertaining), exemption is the study conducted by Guo et al. (2014) that examined the use of SNS for social and information purposes on psychological well-being and study conducted by Valkenburg et al. (2006) that focused on the use of SNS for communication purposes. The effect of social and non-social SNS use is required to be adequately investigated on users' psychological well-being.

Findings showed mechanisms (i.e. social support, perceived social support, social capital, social self-esteem, and authentic self-presentation) through which the use of SNSs may lead to a greater psychological well-being of users. However the significance of these factor as mediators have not been tested. Exception is study conducted by Apaolaza et al (2013). It is recommended that further studies that investigate the relation between SNS use and psychological well-being apply a series of tests such as Sobel to assess the significance of identified factors as mediators between SNS use and psychological wellbeing.

Conducting studies in developing countries and countries with different economic, cultural, educational, and political condition

No major study in our review was conducted in a developing country, which shows a lack of research in this area in these countries. With the fast adoption of SNSs around the world, and in particular in developing countries, more studies are needed to investigate the role of SNS use on users' psychological well-being in these countries.

In addition, with the rapid growth of SNSs around the globe, countries with different cultural, educational, and political condition are increasingly using SNSs. Yet, none of the studies that we reviewed focused on underserved societies, such as communities with cultural appropriateness and literacy and political issues. Future studies are needed to investigate of the use of SNSs for psychological well-being purposes with particular attention to the users' culture, education and policy backgrounds and circumstances.

2.6 Conclusion

This systematic literature review showed that there is empirical evidence for a positive association between the use of SNS and psychological well-being. Two main conclusions can be drawn from this review.

Firstly, research on the theoretical underpinnings between use of SNS and psychological well-being is sparse, and secondly the use non-student users of SNSs have not been adequately investigated to date; most published studies have relied on students for investigating the impact of SNSs use on the psychological well-being of users.

Our findings are subject to limitations. Firstly, even though a broad and structured database search was conducted it is possible that we did not find all related articles. Secondly, by focusing on SNSs which are user-oriented websites, we excluded content-oriented sites such as YouTube. Future research could extend the review to content-oriented sites, and respectively provide evidence on differences between the role of “user-oriented sites” and “content-oriented sites” on users' psychological well-being.

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CHAPTER 3 (PAPER TWO):

EFFECTS OF INTERNET-BASED INTERVENTIONS ON THE
PSYCHOLOGICAL WELL-BEING OF CANCER-AFFECTED PEOPLE: A
SYSTEMATIC LITERATURE REVIEW

Recent studies have shown Internet-based interventions such as support mailing lists and chat rooms had positive effects on cancer-affected peoples' psychological well-being (Hong et al., 2012), accordingly it is important to establish the nature and size of their benefits further develop the Internet-based interventions for cancer affected people (McLaughlin et al., 2012).

Abstract

To lay the groundwork for understanding the relationship between the use of Internet- based interventions and psychological well-being of cancer-affected people and devising strategies for taking advantage of this relationship, we conducted a systematic literature review. This review undertook published studies between 1993 and 2014 addressing the effects of Internet based -interventions on psychological well-being of cancer-affected people. Science Direct, Springer Link, IEEE Explore, Google Scholar, and expert consultation to select articles resulted in 28 articles of which met the selection criteria. Results showed the use of Internet-based interventions by cancer-affected people has positive influence on their psychological well-being. The review revealed that while the effect of other dynamic health-related web-based applications (Web 2.0), such as blogs and forums, on the psychological well-being of cancer patients had been examined, little is known about the specific impact of SNS use on the psychological well-being of cancer-affected people. This review will help investigators set priorities for future research on Social Network Sites as web based support resource for cancer- affected people

Keywords: Internet-based Interventions, Psychological Well-being, Cancer-affected People.

3.1 Introduction

The World Wide Web (WWW) is becoming increasingly influential in health care (Hong et al., 2012). Static health-related web applications (Web 1.0) support one-way information dissemination (Kreps & Neuhauser, 2010; Hong et al., 2012) and dynamic health-related web-based applications (Web2.0) enables Internet users to exchange information and emotional support via interactive communication (Campbell et al., 2013; Vlahovic et al., 2014). Internet-based interventions have capability to foster Information and emotional support disseminations (Bender et al., 2013, Erfani et al, 2013). Studies have shown cancer-affected people, people who have been diagnosed with cancer, increasingly turning to the World Wide Web, drawing upon their new-found ability to communicate with others worldwide in order to obtain informational and emotional support, products and services (McLaughlin et al., 2012; Campbell et al., 2013).

Recent studies have shown Internet-based interventions such as support mailing lists and chat rooms had positive effects on cancer-affected peoples' psychological well-being (Hong et al., 2012), accordingly it is important to establish the nature and size of their benefits further develop the Internet-based interventions for cancer affected people (McLaughlin et al., 2012). A reasonable initial step in the development of new Internet-based interventions is to aggregate and examine the existing evidence-based mechanisms (Kitchenham et al., 2009) then make recommendations (Kitchenham et al., 2009). Therefore, we conducted a formal, systematic literature review of studies on Internet-based interventions and cancer-affected people's psychological well-being to identify existing gaps and suggest further development. This study applied Kitchenham's methodology for aggregating and giving structure to evidence. The remainder of this paper is organised as follows. Section 3.2 shows the method

applied in our systematic review, Section 3.3 present findings, section 3.4 contains discussion and section 3.5 concludes the paper.

3.2 Method

Kitchenham's methodology has three phases: planning the review, conducting the review, and reporting the review. Each phase has several steps that are described in detail in the following paragraphs.

3.2.1 Planning the review

The aim of this paper is to provide a structured review of existing research on the effect of Internet-based interventions on the psychological well-being of cancer-affected people. We carried out a systematic literature review to address the following questions:

SRQ1. Which Internet-based interventions for psychological well-being of cancer-affected people have already been covered?

SRQ2: How have the results of research on the effect of Internet-based interventions on psychological well-being been reported?

SRQ3. What research methods have been applied, and what types of cancer-affected people were the study populations?

SRQ4: How did the academic discussion on the effect of Internet-based interventions on the psychological well-being of cancer-affected people develop in the literature over time?

A protocol was developed which encompassed our search strategy (identifying search terms, selecting appropriate resources and databases), study selection criteria (inclusions and exclusions), a data extraction strategy and the procedures for extracting the information from each study. Search terms were used for addressing the questions of this paper. The purpose of developing a protocol was to decrease the possibility of researcher bias. Four independent

experts with expertise in conducting systematic literature review assessed the protocol and any ambiguities were rectified.

3.2.2 Conducting the review

Search terms were created starting with “Internet-based interventions”, “cancer- affected people”, “cancer patients” and “psychological well-being”. Other terms such as “virtual communities”, “online resources”, “social network sites”, “cancer survivors”, “happiness”, “well-supported”, “hopeful”, “life satisfaction” and “positive affect” were applied to search for titles, abstracts and keywords (where available). A keyword search (an inductive search) was conducted using Science Direct, SpringerLink, IEEE Explore, Scopus and Google Scholar. In addition, we performed a manual search of specific conference proceedings and journal papers published since 1993. We selected the listed databases because they contain studies and have been used as sources for other reviews in the Information Systems field. The Internet was introduced to the public in 1993 (Valkenburg et al. 2006); for that reason, a time frame of 1993 to 2014 was set for the literature search. This initial literature search resulted in 333 papers. Next, we conducted a deductive manual search; the references listed in review papers and book chapters were reviewed, experts were consulted to identify further items.

3.2.3 Study selection

The objective of this step was to filter the relevant studies from the initial pool of 333 articles in the previous step. This stage included two main activities: determination of study selection criteria and the study selection process.

Study selection criteria. Inclusion criteria were used to filter those studies that provided direct evidence relating to our research questions. Two inclusion criteria were used: (1) studies that

explicitly report psychological well-being as an outcome of Internet-based interventions, and (2) studies that were peer-reviewed.

Study selection process. Each paper's title, abstract and keywords were analysed to determine its relevance to our research questions. Firstly, we reviewed the abstracts of the 333 initially identified papers. Using the exclusion criteria, 291 studies were excluded, leaving 42. The full texts of these 42 papers were then reviewed carefully and the inclusion criteria used to filter the most relevant papers. This resulted in 26 papers. Secondly, a deductive search was conducted by reviewing the reference lists of the 26 papers; we found 2 additional papers.

3.2.4 Data extraction

The data extracted from each study were as follows: Internet-based interventions, research methods applied type of cancer-affected people in the study population, concepts of psychological well-being, year of publication, journal of publication and country in which study was conducted,.

3.3 Findings

We identified 28 articles that report the positive effect of Internet-based interventions on the psychological well-being of cancer-affected people (Table 3.1).

Table 3.1: Papers on Internet-based interventions and psychological well-being of cancer-affected people

Study	Author(s)		Journal
S1	Gustafson et al	1994	Journal of Psychosocial Oncology
S2	Weinberg et al	1996	Social Work with Groups
S3	Weinberg et al	1996	Health & Social Work
S4	Wiljer et al	2011	Journal of Cancer Education
S5	Gustafson et al	1999	Quality in Health Care: QHC
S6	Gustafson et al	2001	Journal of General Internal Medicine
S7	Gustafson et al	2005	Journal of Health Communication
S8	Fernsler and Manchester	1996	Cancer Practice
S9	Shaw et al	2000	Journal of Health Communication
S10	Shaw et al	2007	Health Education Research
S11	Shaw et al	2006	Health Communication
S12	Wise et al	2008	Patient Education and Counseling
S13	Fogel et al	2002	Health Psychology
S14	Fogel et al	2003	Psycho-Oncology
S15	Fogel et al	2004	Cancer
S16	Lieberman et al	2003	Cancer
S17	Winzelberg et al	2003	Cancer
S18	Meier et al	2007	Journal of Medical Internet Research
S19	Owen et al	2005	Annals of Behavioral Medicine
S20	Changrani et al	2008	Prim Psychiatry
S21	Hoybye et al	2005	Psycho-Oncology
S22	van Uden-Kraan et al	2008	Qualitative Health Research
S23	Vilhauer et al	2009	Women & Health
S24	Høybye et al	2006	Psycho-Oncology
S25	Rodgers et al	2005	Journal of Computer Mediated
S26	Shim et al	2011	Journal of Communication
S27	Stephen et al	2014	Social Science & Medicine
S28	Campbell et al	2013	International Journal of Web Based

SRQ1: What Internet-based interventions and what types of cancer population were considered in reviewed studies?

Table 3.2 lists Internet-based interventions tested in existing studies. As Table 3.2 shows, studies have examined the effect of different internet-based intervention such as such as websites, blogs, forums, mailing lists, forum and chat rooms on the psychological well-being

of cancer patients. Comprehensive Health Enhancement Support System (CHESS) was the most common Internet-based intervention in the reviewed studies.

Table 3.2. Internet-based interventions and type of cancer population

ID	Target population	Type of Online support resource
S1	Breast cancer affected people	Health enhancement support system
S2	Breast cancer affected people	Bulletin board
S3	Breast cancer affected people	Bulletin board
S4	Gynaecologic cancer	Computer based group
S4	Prostate and breast cancer affected people	Internet cancer support group (ICSG)
S5	Low income breast cancer affected people	CHESS
S6	Low income breast cancer affected people	CHESS
S7	Low income breast cancer affected people	CHESS
S8	Various cancer affected people	Home-based computer support group
S9	Breast cancer affected people	CHESS
S10	Breast cancer affected people	CHESS
S11	Breast cancer affected people	CHESS
S12	Breast cancer affected people	CHESS
S13	Breast cancer affected people with recent diagnosis	General Internet use
S14	Breast cancer affected people with recent diagnosis	General Internet use
S15	Breast cancer affected people with recent diagnosis	General Internet use
S16	Breast cancer affected people	Online cancer forum
S17	Breast cancer affected people	Home-based computer support forum
S18	Various cancer affected people	Cancer related mail list
S19	Early stage breast cancer affected people	Online coping group
S20	Early stage breast cancer affected people	website
S21	Breast cancer affected people	Email list
S22	Breast and arthritis cancer affected people	Electronic support group
S23	Metastatic breast cancer affected people	Electronic support group
S24	Various cancer affected people	Online chat rooms, discussion rooms
S25	Breast cancer affected people	Online discussion boards
S26	Gynaecologic cancers	Online support groups
S27	Various cancer affected people	Synchronous groups using live chat
S28	Prostate cancer	Online forum

As can be seen from table (3.2) most reviewed studies used populations with particular cancers, including gynaecological cancer, prostate cancer; some used people with various cancers. Most of the reviewed studies (n=19) focused on women with breast cancer.

SRQ2: How have the results of research on the effect of Internet-based interventions on psychological well-being been reported?

The reviewed papers showed that internet-based interventions could positively influence the psychological well-being of cancer-affected people. Studies reported that Internet-based interventions enabled cancer-affected people experience greater psychological well-being. Reviewed studies reported psychological-wellbeing in terms of being more hopeful, empowered, and better participation in health care programs. However, the reviewed papers did not invoke theoretical justifications to explain these positive effects. This shows there is lack of theoretical underpinnings for the concept of online cancer support.

SRQ3: What research method and research design were employed in the studies of the effect of Internet-based interventions on the psychological well-being of cancer-affected people?

Of 28 reviewed papers, 19 used qualitative research methods with various research designs; seven studies used cross-sectional interviews, four papers applied content analysis and eight studies employed pre-post interviews. Nine studies applied quantitative research methods. Table 3.3 shows the research methods and designs employed in the reviewed studies.

Table 3.3. Research designs of the reviewed studies

Study	Research design
Gustafson et al(1994)	Post Interview
Weinberg et al(1996)	Qualitative interview
Weinberg et al(1996)	Qualitative interview
Wiljer et al(2011)	Qualitative Interview
Gustafson et al(1999)	Pre post Interview
Gustafson et al(2001)	Pre-post Interview
Gustafson et al(2005)	Pre-post Interview
Fernsler and Manchester(1996)	Cross sectional survey
Shaw et al(2000)	Pre post Interview
Shaw et al(2007)	Pre-post Interview
Shaw et al(2006)	Pre-post Interview
Wise et al(2008)	Pre-post Interview
Fogel et al(2002)	Cross- sectional Survey
Fogel et al(2003)	Cross- sectional Survey
Fogel et al(2004)	Cross- sectional Survey
Lieberman et al(2003)	Pre post survey
Winzelberg et al(2003)	Pre post survey
Meier et al(2007)	Qualitative content analysis
Owen et al(2005)	Randomised control trial
Changrani et al(2008)	Randomised control trial
Hoybye et al(2005)	Qualitative interview
van Uden-Kraan et al(2008)	Survey and interview
Vilhauer et al(2009)	Survey and interview
Høybye et al(2005)	Randomised control trial
Rodgers et al(2005)	Qualitative-longitudinal
Shim et al(2011)	Qualitative
Stephen et al(2014)	Qualitative
Campbell et al(2013)	Qualitative

RQ4: How did the academic discussion on the effect of Internet-based interventions on the psychological well-being of cancer-affected people develop in the literature over time?

To gain insights into this phenomenon, we compared the number of papers published each year. The first study was conducted in 1994 (Gustafson et al., 1994); the level of publication activity changed little until 2003, when three papers were published, and peaked in 2007 at

four papers. Figure 3.1 shows the annual number of publications about research on Internet-based interventions and psychological well-being of cancer-affected people.

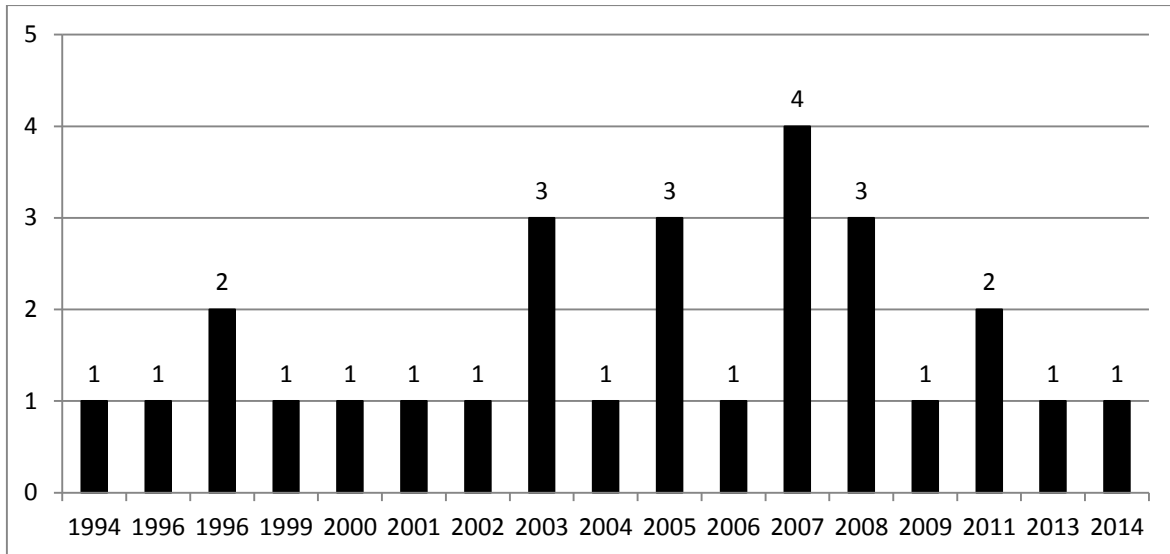


Figure 3.1 Number of reviewed papers by year of publication

Figure 3.2 shows publication outlets, which were most receptive on research on effect of Internet-based interventions on the psychological well-being of cancer affected peo. As it can be seen Cancer and Psycho-oncology were the most receptive journals to research on Internet-based intervention and cancer-affected people.

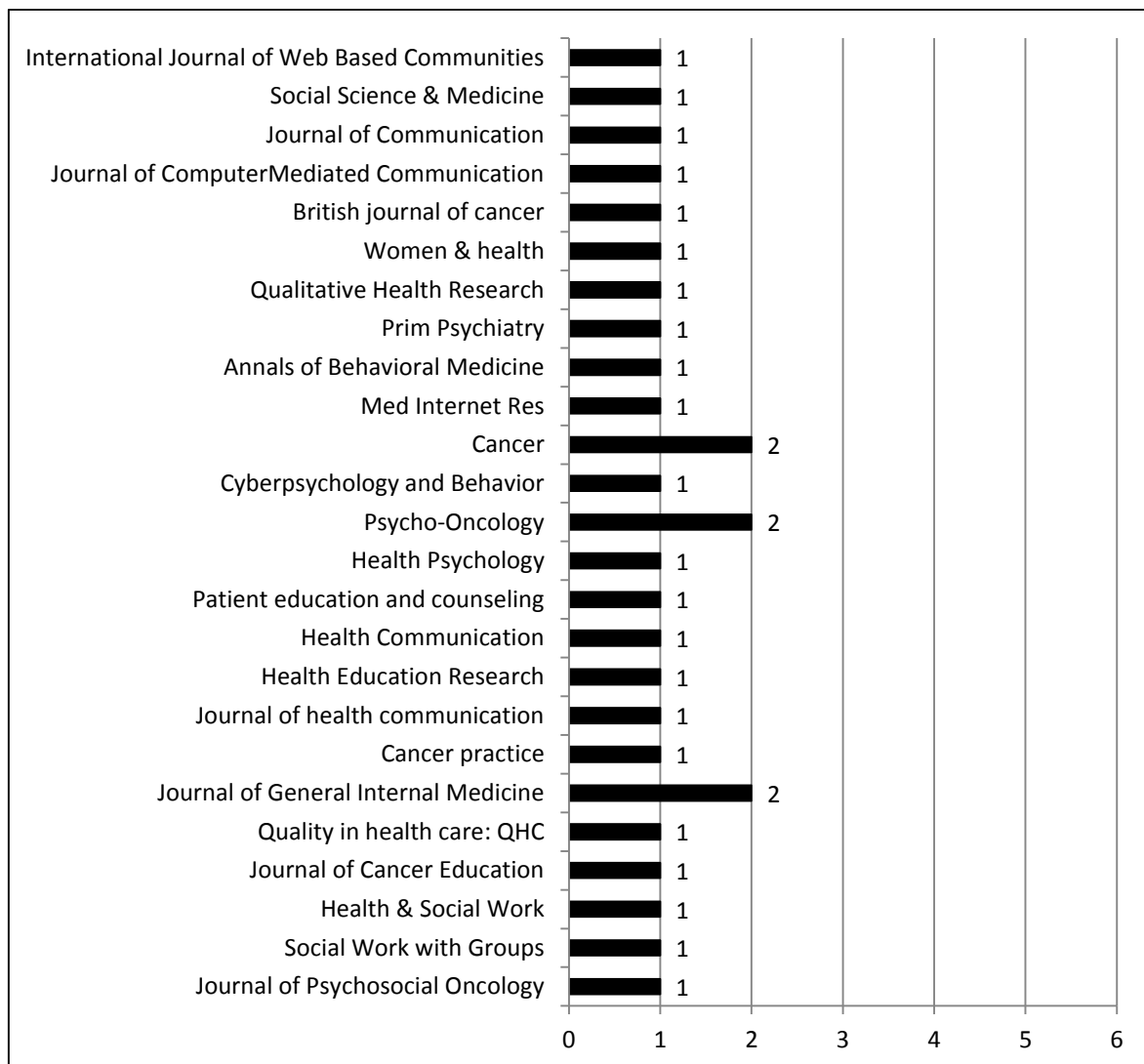


Figure 3.2. Number of relevant publications by journal

Twenty-two of twenty-eight studies were conducted in the USA, and the remaining studies in Canada, Denmark, the UK and The Netherlands. As it can be seen from Figure 3.3 no major study in our review was conducted in developing countries, which shows a lack of research in these countries.

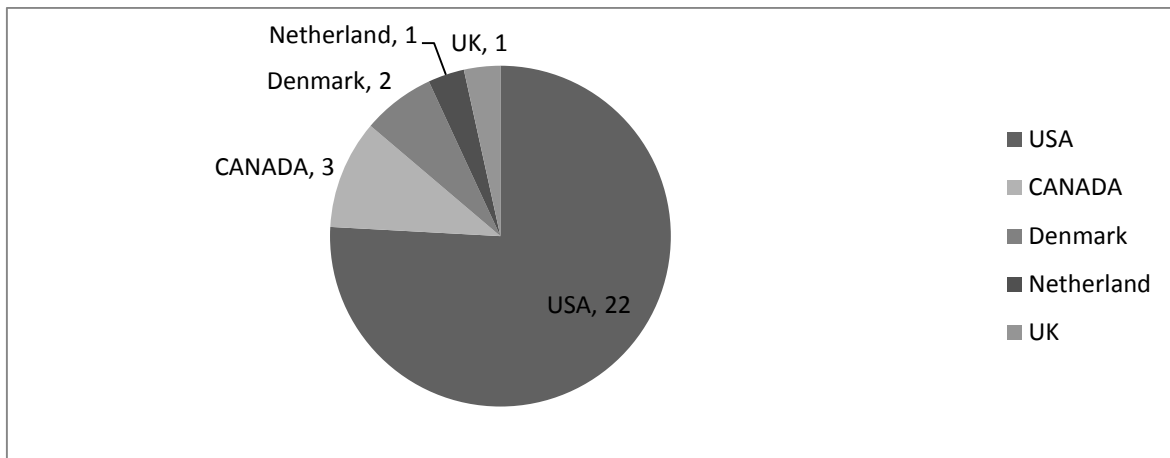


Figure 3.3. Number of relevant publications by countries

3.4 Discussion

This paper provides a structured review of existing research on the effect of Internet-based interventions on the psychological well-being of cancer-affected people. It explains how the academic discussion on the effect of Internet-based interventions on the psychological well-being of users developed in the literature over time, identifies Internet-based interventions that have already been studied, the research methods that have been applied, the types of cancer-affected participants involved, the research results, and the areas needing further investigation. It provides evidence that Internet-based interventions improve the psychological wellbeing of cancer-affected people.

Our search found 28 papers that met our inclusion criteria. Studies are published across many journals; most of the researches on Internet-based interventions for psychological well-being of cancer-affected people were performed in the USA. With the fast adoption of internet based intervention around the world more studies are needed to investigate the impact of Internet-

based intervention on the psychological-wellbeing of cancer affected people in other countries.

Reviewed studies have employed a variety of research designs, including cross-sectional interviews/surveys (most common), pre-post studies and randomised controlled trials. Future research should use longitudinal approaches, particularly investigations that compare cancer-affected peoples' psychological well-being before and after using Internet-based interventions.

Researchers have evaluated the effects of CHERS, bulletin discussion boards, ICSG and general Internet use. This shows a need for special attention to the other categories of Internet-based interventions. Despite the widespread use of Social Network Sites (SNSs), little is known about the impact of their use on the psychological well-being of cancer-affected people.

Populations study included people with breast cancer, gynaecologic cancer, prostate cancer, and groups composed of people with various cancers. Future studies are encouraged to consider other populations affected by cancer, to test whether previous findings generalise to other populations.

None of the reviewed studies advanced theoretical justifications for the positive effect of their internet-based interventions on the psychological well-being of cancer-affected people. Further studies are encouraged to apply theoretical perspectives to explain this relationship.

Our findings are subject to limitation even though a broad and structured database search was conducted it is possible that we did not find all related papers.

3.5 Conclusion

This review suggests that access to Internet-based interventions can positively affect the psychological well-being of cancer-affected people. Three main conclusions can be drawn. Firstly, the review revealed that while the effect of dynamic health-related web-based applications (Web 2.0), such as blogs and forums, on the psychological well-being of cancer-affected people had been examined, little is known about the specific impact of SNS use on the psychological well-being of cancer-affected people. Secondly, the paper showed that the theory behind online cancer support is poorly developed. Finally this review also showed that studies published to date have focused overwhelmingly on women with breast cancer.

The result of this contributes to better understanding of the positive role of Internet-based interventions for improving psychological well-being. Clarifications of the relationship between the use of Internet-based interventions and psychological well-being of cancer affected people might be useful for health and social services. This review helps investigators set priorities for future research on internet-based interventions and resources for cancer-affected people.

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CHAPTER 4 (PAPER 3):

THE INFLUENCE OF HEALTH-SPECIFIC SOCIAL NETWORK SITE USE
ON THE PSYCHOLOGICAL WELL-BEING OF CANCER-AFFECTED
PEOPLE

Most previous studies on SNS use and psychological well-being relied on healthy students as participants. Little is known about other cohorts of SNS users, in particular people living with serious health conditions.

Recent studies have shown Internet-based interventions such as support mailing list and chat rooms had positive effect on cancer affected peoples' psychological well-being. However, to date little research attention has been paid to the ability of SNSs to promote the psychological well-being of cancer-affected people (Erfani&Abedin, 2014).

Abstract

Objective: We aimed to explore and examine how and in what ways the use of Social Network Sites (SNSs) is related to promoting health outcome, better psychological well-being, of cancer-affected people.

Methods and Materials: Qualitative semi-structured interviews were conducted with users of the Ovarian Cancer Australia Facebook page (OCA Facebook). Twenty-five women who were affected by ovarian cancer and were users of OCA Facebook were interviewed. A multi-theory perspective was employed to interpret the data.

Results: Results showed most interviewees used OCA Facebook daily. Some users were passive and only observed created contents; others actively posted content and communicated with other members. Analysis showed that the use of OCA Facebook enhances social support, improves the experience of social connectedness, develops social presence and learning – and ultimately, improves psychological well-being.

Discussion: The strong theoretical underpinning of our research and empirically-derived results produced a new understanding of the capacity of SNSs to improve psychological well-being. Our study provides evidence enabling the integration of these tools into existing health services. This study also contributes to formal knowledge of the implications of SNS use for the psychological well-being of cancer-affected people.

Conclusion: This research assessed the relationship between the use of OCA Facebook and the psychological well-being of cancer-affected people, and confirmed the capacity of this SNS to improve psychological well-being, demonstrating the potential value of SNSs within support services in the health care industry.

Keywords: Social Network Sites, Facebook, cancer-affected people, psychological well-being, social support, social connectedness, social presence, learning

4.1 Introduction

Social Network Sites (SNSs) are networked communication platforms in which users can create profiles and content, establish connections, share content, develop interactions with their connections and consume content provided by their networks,[1, 2, 3].

Information Systems researchers have highlighted the capacity of SNSs to foster informational and emotional exchange, knowledge sharing and the development of extensive supportive interactions,[4-8] which are predictors of better health outcomes,[9-12] such as greater psychological well-being (feeling happy, capable, well supported, and satisfied with life),[13,14,15]. However, little is known about the capacity of SNSs for health promotion in populations with poor health, [16] such as cancer-affected people (people who have been diagnosed with cancer, including those who are either in treatment or have completed their treatment),[17,18]. Cancer-affected people use SNSs for exchanging information and emotional support with others with similar health concerns, or with people who can address a cancer-related concern,[19,20] but whether health-specific SNSs can improve cancer-affected people's psychological well-being remains unknown,[21].

The aim of this paper was to explore how and in what ways cancer-affected people's use of a particular SNS, Ovarian Cancer Australia Facebook page (hereafter OCA Facebook), affects their psychological well-being. OCA Facebook is a health-related SNS that provides cancer-affected people with support, promotes cancer awareness events, connects like-minded people and suggests positive behaviours to stay healthy while living with cancer. OCA Facebook

enables people affected by ovarian cancer to connect and exchange information about their conditions, treatments and symptoms, and support one another.

The paper is organised as follows. Section 4.2 provides the background, and outlines the significance of the research and the primary research question. Section 4.3 outlines the theoretical underpinnings of the study. Section 4.4 explains the research method. Section 4.5 presents the findings, which are discussed in section 4.6. Section 4.7 contains the conclusions and suggestions for future research.

4.2 Research background and significance

The World Wide Web (WWW) is becoming increasingly influential in health care. Consumers of health services, including cancer-affected people, use the WWW because it enhances their ability to communicate with others to obtain health-related information, emotional support, products and services,[22-25]. E-health tools such as static health-related web applications (Web 1.0) enable cancer-affected people to acquire cancer-related information, [26,27] but dynamic health-related web-based applications (Web2.0) such as SNSs, blogs and forums empower cancer-affected people to exchange health-related information and experiences,[28], make sense of acquired information,[29,30] and promote changes in health-related behaviours, [31]. One major advantage of SNSs over other web 2.0 applications such as blogs is that they display a list of friends, which enables users to maintain more intensive interactions,[32]; this capability is unique to SNSs,[33].

SNS allow people who lack mobility or are otherwise unable to interact normally due to their illnesses to develop extensive supportive interactions and exchange information with people with similar health concern,[34, 35]. To facilitate communication among users, SNSs such as Facebook offer various messaging services including private and public messaging,[36, 37,

38]. In the course of information dissemination, Facebook allows users to create content on their own message board, called a wall, or post content to another user's wall,[39, 40]. Users can spread wall posts in their networks via information distribution functionality such as 'share', 'like' and 'tag photos' with only a single click,[41, 42]. Portable web-enabled devices such as smartphones, tablets and laptops,[43] make Facebook highly accessible to people with mobility or other communication difficulties.

Psychological well-being is defined in the literature in terms of autonomy, personal growth, self-acceptance, life purpose, environmental mastery, and positive relatedness,[44]. Autonomy means being able to resist social pressures; personal growth refers feelings of continued development; self-acceptance means holding positive attitudes toward oneself; life purpose is a sense of direction in life; environmental mastery is about feeling competent in creating context suitable to personal needs and value; positive relatedness is the extent in which one forms satisfying relationship with others,[45]. Psychological well-being can also be conceptualised as feeling happy, capable, well supported, and satisfied with life,[46- 49]. A diagnosis of cancer is a life-changing event and takes a great toll on a person's psychological well-being,[50]. Cancer-affected people are a growing segment of the population; they are likely to have poorer psychological well-being and mental health than healthy people, and often need interventions and support,[51]. Developing knowledge and providing evidence of novel tools and technologies that can improve cancer-affected health outcomes, such as psychological well-being, is a major benefit. While the impacts of other Web 2.0 applications such as blogs, forums and chat rooms on cancer-affected people's psychological well-being have been measured,[52] as previously noted, little is known about the impact of SNS use on the psychological well-being of cancer-affected people. Therefore, this paper addresses the

research question: How and in what ways does SNS impacts the psychological well-being of cancer-affected people?

4.3 Theoretical underpinnings

This study used a multi-theory perspective to guide the inquiry process and to frame the interpretation of the findings. The following section outlines the theories used in this study.

4.3.1 Social Support Theory

Social support is the beneficial exchange of psychological and tangible resources between at least two individuals,[53, 54]. Caplan defined social support as emotional and informational resources exchanged between people through their social connections,[55]. Cutrona and Suhr,[56] listed five different types of social support: esteem support, emotional support, tangible support, network support and informational support. Esteem support refers to expressions of positive communication behaviours for support seekers' skill and abilities. Emotional support refers to expressions of caring, sympathy, listening, understanding, empathy, and encouragement. Network support refers to expressions of companionship and connection. Tangible or instrumental support is the provision of needed goods and services. Informational support refers to guidance, advice, facts, stories of personal experience, opinions and referrals to other sources of information and information that aims to eliminate or solve support seekers' problems or help in evaluating situations,[57]. It is noted that social support in online communities measures how an individual experiences the feeling of being cared for, responded to and assisted by people in their social networks,[58]. Studies used social support theory to explain the influence of individuals' social connections on health outcomes,[59, 60].

Social support has been recognized as an essential factor for supporting positive health outcomes, [61, 62] such as experiencing greater psychological well-being, [63, 64]. In one study, longitudinal predictors of change in subjective well-being of breast cancer survivors were examined using hierarchical multiple regression; improvements in subjective well-being were found to relate to higher levels of social support,[65]. Studies have reported online health communities such as online support groups as a useful source of social support for cancer survivors,[66,67]. Researchers showed positive correlations between the amount of participation in online breast cancer communities (through channels such as bulletin boards) and receiving social support, and consequently the psychological well-being of breast cancer survivors,[68,69].

Studies have shown the importance of information and emotional exchange in improving cancer survivors' psychological well-being,[70] and other studies have highlighted the capacity of SNSs in facilitating information and emotional support exchange, [71]. Thus, the social support theory fits well within the SNS context, and can be used to understand how Facebook use is associated with the psychological well-being of people affected by cancer.

4.3.2 Belongingness Theory

Belongingness theory provides a useful theoretical lens to explore the power of social connections in forming social connectedness and consequently better health outcome [72,73]. Social connectedness is described as emotional connectedness and a sense of belonging between an individual and other people,[74]. According to belongingness theory, individuals develop meaningful relationships to experience a sense of belonging and consequently experience greater psychological well-being and better mental health,[75].

Studies on peer support context showed that cancer survivors experienced sense of belonging when participating in online support groups, and explained that belonging to a peer network can promote optimism, [76]. Other studies introduced social connectedness as a significant, positive predictor of perceived health and well-being [77,78]. Social connectedness forms through supportive interactions, [79]. Research has highlighted the capability of SNSs in enhancing supportive interactions,[80]. Thus, belongingness theory can explain the capability of Facebook to develop supportive interactions and improve the psychological well-being of cancer-affected people.

4.3.3 Sociocultural Theory (SCT)

Scholars have used Sociocultural Theory (SCT) to study the power of social connections and social interactions in developing learning,[81]. SCT has also been used to explain the influence of learning in social environments on individuals' psychological well-being,[82]. Sociocultural Theory focuses its full attention on learning as a social process. The concept of regulation derives from sociocultural theory where learners are said to progress from other regulation to self-regulation. According to SCT successful learning involves moving from object and other regulation to self-regulation. Object regulation is the stage that learners' start to learn by the object they observe in a social environment. Other regulation stage is when learners learn by obtaining assistance and receiving feedback from peers or mentors in a social environment. Self-regulation stage is when learner becomes competent enough to perform independently,[83].

Studies showed a positive association between the use of Internet-based interventions such as health-related support group and cancer patients' learning,[84]. A qualitative study on online

support groups showed that the use of Scandinavian breast cancer mailing lists and feedback enabled breast cancer survivors to learn how to live with illness. This study also reported learning from each other about illness and a sense of control promoted well-being of breast cancer survivors,[85].

SNSs have capability to enable their users to develop interactions with others as well as observe interactions, [86,87], therefore SCT is appropriate for understanding how Facebook use enables people affected by cancer to interact, observe and learn, and its association with psychological well-being.

4.3.4 Social Presence Theory

Social presence is defined as the sense of understanding communications in a community, [88] or the degree to which a medium allows users to experience others' presence in a social environment,[89]. Social Presence Theory (SPT), initially proposed by Short et al. [90], holds that communication is effective if the medium has the appropriate social presence essential for the level of interpersonal involvement required for a task. According to SPT, the degree of social presence varies in different media depending on its capability for rapid feedback, conveying non-verbal cues, and reducing communication ambiguity.

Researchers have demonstrated a positive link between experiencing social presence and enhancing users' satisfaction and positive feelings,[91]. Social presence within online environments leads to positive health outcomes,[92]. Studies of interactive cancer communication systems showed breast cancer patients who using the Comprehensive Health Enhancement Support System (CHESS) experienced social presence through the CHESS discussion group and closer connection with a professional, leading to increased emotional well-being,[93].

Lee [94] argued that interactivity is an essential condition for social presence; other scholars claim that social presence requires a feeling of togetherness and mutual awareness,[95]. Research has shown the specific capacity of SNSs in interaction development enables users to feel each other's presence,[96]. SNSs have the potential to support understandable communication. Within Facebook, for example, users can develop audio and video chat for communication, 'tag photos', 'like' or 'share' videos to improve communication,[97]. As previously argued, social presence, both with real and virtual others, is important for cancer patients. Thus, SPT is highly suited to our aim of understanding how Facebook use affects the psychological well-being of people affected by cancer. This study applies the perspective of SPT to explain how Facebook supports effective communication and feeling the presence of others that leads to greater psychological well-being. Figure 4.1 below summarises the perspectives of the theories that underpin this research.

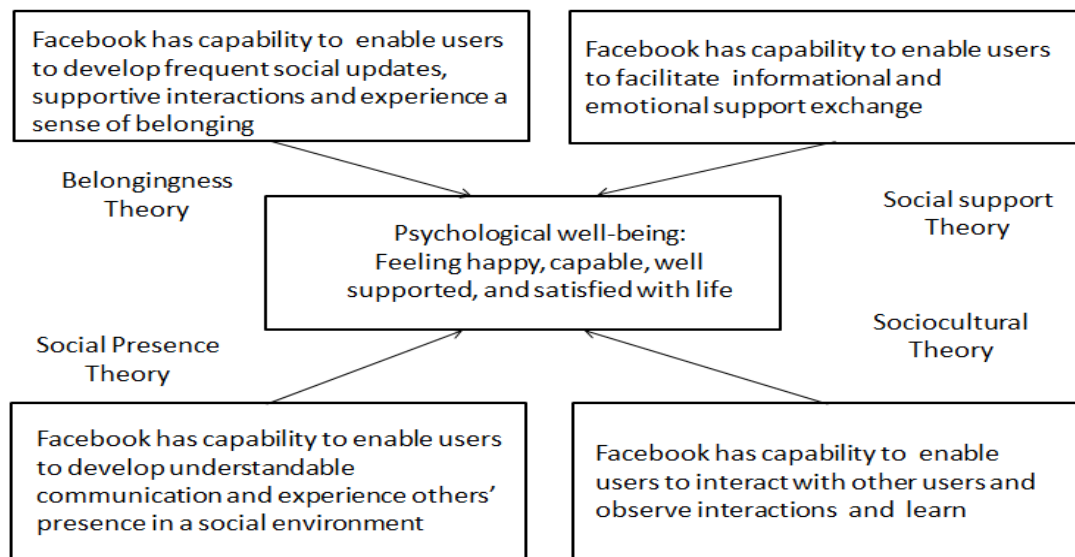


Figure 4.1. Summary of the theoretical background of the research

The integration of these four theories provides the conceptual framework for understanding the impact of SNS use such as Facebook use on the psychological well-being of cancer-affected people. The theories show the relationships and interrelationships mediated by Facebook using different perspectives including sociability, exchange of informational and emotional support, social connectedness and learning. The implications on the psychological well-being of cancer-affected people and OCA Facebook use includes the theories of social presence, belongingness, social support and sociocultural. Taken together, the theories form a framework that informs our understanding.

4.4 Research method

Due to the exploratory nature of this research, an interpretive qualitative approach was used to explore the relationship between SNS use and psychological well-being. This was appropriate because the objective was to understand the experiences of people involved in the study,[98].

4.4.1 Case study

A case study approach was used for conducting in-depth investigations and developing deep knowledge of SNS use and psychological well-being,[99]. OCA Facebook was an appropriate SNS for an examination of the psychological well-being of cancer-affected people, as it is used by large numbers of cancer-affected people for exchanging informational and emotional support. In February 2014 OCA Facebook had 9,499 members, with an average of 16 posts, 40 comments, and 15 shares every week, suggesting it is an active online environment,[100]. OCA Facebook is maintained and moderated by Ovarian Cancer Australia (OCA), an independent national organization that supports people affected by ovarian cancer. OCA Facebook offer authoritative cancer-related information, posts positive stories to support

staying healthy while living with cancer, and enables people affected by ovarian cancer to develop supportive interactions and communications. Commercial and unrelated content and negative comments and posts are not permitted.

After we obtained ethical approval from Macquarie University's ethics committee [Appendix III] , in November, 2013 the OCA Facebook administrator was contacted for permission to post an invitation to users of the OCA Facebook page to participate in an interview. Interviewees were self-selected. Choosing a study sampling approach is particularly important in qualitative research,[101,102] and the goal of this research was to ensure the study sample was representative of the target population. Interviewees had to be over the age of 18 and have used the OCA Facebook for more than two months.

4.4.2 Participants

Twenty-five women who were affected by ovarian cancer (mean age=39 years, median=41 years, SD=5.6) participated in this study. Eleven interviewees had stage 2 cancer (the cancer had not started to spread into surrounding tissue), three were in stage 4 (the cancer had spread to another body organ – also called secondary or metastatic cancer), and the remainder were in other stages or had recovered. The sample size for this study was not predetermined, but rather decided by the saturation point of the data. Recruitment ceased when the information collected from a sufficiently variable sample became repetitive across individuals, and new themes no longer emerged,[103]. This point occurred during the 25th interview. Table 4.1 shows some characteristics of our qualitative sample.

Table 4.1: Interviewees’ demographic and other characteristics

Interviewees’ Characteristics	Number (%)
Age	
18-25	2 (8%)
26-35	5 (20%)
36-45	7 (28%)
46-55	5 (20%)
56-65	6 (24%)
Months using OCA Facebook	
2-5	2 (8%)
6-11	4 (16%)
12-17	9 (36%)
18-23	7 (28%)
>24	3 (12%)
Interviewees’ location	
Melbourne	8(32%)
Sydney	5 (20%)
Canberra	4 (16%)
Brisbane	3 (12%)
Perth	3 (12%)
Adelaide	2 (8%)

4.4.3 Data collection

Semi-structured interviews were chosen to give the interviewer freedom to modify the format and order of questions as appropriate,[104]. The interviews were conducted via telephone, Skype and face-to-face depending on participant preference, in February and March 2014. Questions were phrased to allow interviewees to tell their story in their own way, while an interview guide was used to ensure the information needed was gathered. Interviewees were asked 13 open-ended questions (Appendix I) to gather feedback on participants’ experiences with using OCA Facebook, their assessments of their mental health states after using OCA Facebook, and their perceptions of the usefulness and helpfulness of OCA Facebook. Interviewees also estimated the amount of time they spent on OCA Facebook (frequency, duration), and described their history of OCA Facebook use and the specific activities they

undertook while using OCA Facebook. Interviews took around 45 minutes and most were audiotaped with permission from the interviewees. The interviews were transcribed for qualitative data analysis, as outlined in the following section.

4.4.4 Data Analysis

Thematic analysis, the process of collecting candidate themes and creating relationships between themes, was used to identify, analyse and report themes. A theme captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the dataset, [105].

The choice of a unit of analysis is essential in concept development and in data analysis. [106]. According to Graneheim and Lundman, [107] “Unit of analysis should be large enough to be considered as whole and small enough to be possible to keep in mind as a context for the meaning unit, during the analysis process” (p. 106). We considered a meaning unit as sentences and words containing aspects related to each other through their content and context. We analysed the transcribed interview data using NVivo 8, software that facilitates the coding and sorting process. Responses were coded in six phases: familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final reports,[108]. First, each transcript was uploaded to NVivo and read several times to obtain a sense of the whole. The interview text was divided into content areas based on theoretical assumptions derived from the literature. Within each content area, the text was divided into meaning units. The condensed meaning units were abstracted and labelled with a code. The various codes were compared and sorted into nodes in NVivo. Examples of meaning units, condensed meaning units and codes are shown in Table 4.2.

Codes that were closely linked in meaning were formed into categories, creating the manifest content,[109]. Next, the underlying meaning – that is, the latent content – of categories was formulated into themes. Themes were reviewed to compare and reconcile discrepancies, and themes with a similar meaning were combined in matching nodes. Throughout this process, the theme descriptions were continuously augmented and clarified to ensure that all participants' experiences were represented. Table 4.3 shows examples of codes, categories, sub-theme and themes from data analysis.

Table 4.2: Examples of meaning units, condensed meaning units and codes

Meaning Unit	Condensed meaning unit	Code
Facebook is more of a casual sort of method of maybe text chatting with someone or a video chat.	Video and text chatting	Chatting
News about cancer related events come directly to my newsfeed.	Observing Information through newsfeed	Checking news feed
I feel I belong to the community that the members love me.	Belonging to a community	Sense of belonging
OCA Facebook use kept me updated because there's so much information.	Feel well supported and informed	Continued development
I could learn from the people's interaction on OCA Facebook that some tests like pap smear test is important.	Learning from people's interaction	Learning
When the doctors have told you that you might not make it to Christmas it doesn't give you much hope, but when you use OCA Facebook and read their hopeful posted quotes and emotional sentences you say doctors are not God.	Feeling hopeful	Resist cancer related pressure
I was talking to someone and commenting on her posts and then she told me that there is a trial that I might be able to be involved to.	Being informed Talking and commenting	Information exchange Active use
I could meet new people and get some friendship from it and I could make sense of information provided by my doctors	Making good friend ships	Satisfying relationship
I feel a connection or something like a bond, you feel like you've got something in common as well because when you go through cancer, people who haven't had cancer tell you lots of things and they really don't know what you're going through.	Feeling connected and having bond	Sense of belonging
I feel good when I have more information related to ovarian cancer and it keeps me update. You know it's good, it keeps you update with everything.	Being informed Continues update Good feeling	Well supported Feeling good
I do chemo every week, once that I posted, many posts came just in a minute to say, "Stay positive," I felt positive	Posting comments and Receiving feed back Feeling positive Emotionally supported	Active use Feeling Positive Emotional support

Table 4.3: Examples of codes, categories, sub-theme and themes from data analysis

Codes	Categories	Sub-them	Themes	Main Theme
Checking news feed Observing posted contents Reading public posts	Passive use			
Public posting Chatting Liking content Sending private messages	Active use	Type of activities in OCA Facebook	Using OCA Facebook Actively and Passively	
20 minutes per use 30 minutes per use 10 minutes per use	Duration of use			
Four times a week Three times a week Daily use	Frequency of use	Intensity of using OCA Facebook		
Delight Satisfied Comfortable Less isolation Relaxed	Pleased and feeling good	Happy and satisfied		Using OCA
Optimism Hopeful Feel good Positive attitude	Feeling hopeful and satisfied	Positive attitude	Experiencing psychological well-being	Facebook improves cancer-affected people's psychological well-being
Empowered Well supported Confident	Capable	Able to resist cancer related pressure		
In touch Involvement Belonging Being update	Feeling connected	Social Connectedness		
New idea New insight Awareness Understanding	Obtaining knowledge and views	Learning		
Caring Understanding Empathy Advice Recommendation	Obtaining Informational and emotion exchange	Social support	Factors that mediate the relation between OCA Facebook and psychological well-being	
Understandable communications Sense of sociability Sense of human warmth	Experiencing Effective communication	Social presence		

Rigor was addressed in this study by following Yin's guidelines,[110] with respect to construct validity and internal validity. To ensure construct validity, two techniques were used. The first was triangulation through the use of multiple sources of evidence, including the authors' own systematic literature review on the use of internet-based interventions for cancer-affected people,[111]. The second one was interviewee reviews of the case study reports to ensure the accuracy of the transcription, establishing a chain of evidence through the use of a case study repository. Internal validity was addressed through careful selection of cases and interviewees, sound data collection procedures, correct selection of theory and the literature review.

Reliability was addressed in this study through the use of a case study protocol for all interviews, a case study repository to store all research data, and a pilot study to ensure interview questions were appropriate. A pilot study, as advised by Neuman,[112] is a method that can increase the reliability of measures.

4.5 Results

Analysis of interview data revealed three major themes. Figure 4. 2 shows the relationships between themes and sub-themes (explained in the following paragraphs).

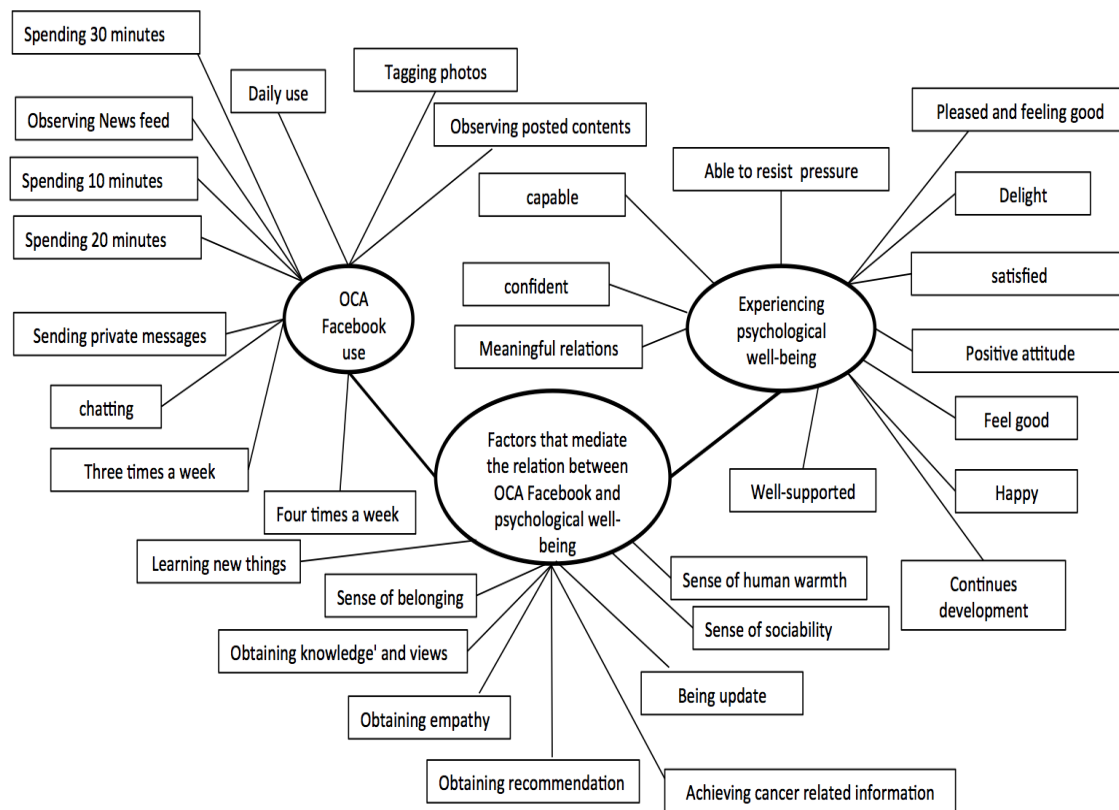


Figure 4.2. Thematic map of SNS use and psychological well-being

Figure 4.2 depicts emergent themes and the relationships between themes. Themes shown in circles are active and passive use of OCA Facebook, experiencing psychological well-being and factors that mediate the relation between OCA Facebook and psychological well-being. Each theme is explained in details in the following paragraphs.

Active and passive use of OCA Facebook

This theme included two sub-themes: intensity of OCA Facebook use and type of OCA Facebook use (active use and passive use). Four interviewees reported only passive participation, while the remainder (n=21) were both actively and passively engaged in OCA Facebook discussions.

Active use included activities such as chatting, liking, creating content and sending messages.

The following quotes show how interviewees actively used OCA Facebook:

I comment on posts on OCA Facebook and I like the shared information.

(Interviewee #3)

I chat with people on OCA Facebook and also send them private messages.

(Interviewee #19)

Passive use of OCA Facebook included observing the content and monitoring posts. The following quotes illustrate passive use of OCA Facebook:

There are people who have written about their mothers that are doing well. I read their stories. (Interviewee #4)

I see anything OCA Facebook shares since they come up on my news feed.

(Interviewee #12)

Intensity of use is considered as a combination of duration and frequency of use in this study. Duration of use is the amount of time that cancer-affected people spend on OCA Facebook per visit. Frequency of use refers to the number of times that cancer-affected people login to OCA Facebook per week. Duration per visit averaged 11 minutes. Means were calculated with outliers removed to decrease the large degree of variability (an outlier was defined as any value falling more than two standard deviations above or below the mean duration per visit). There were two outliers for duration of OCA Facebook use, both at the very high end of the distribution. With outliers removed, the mean duration of passive OCA Facebook use was 11.8 min per visit (SD= 6.73; Median = 15.00) and of active OCA Facebook use was 11 min per day (SD= 5.53 Median = 10.00).

Most interviewees (n=19, or 76%) used OCA Facebook daily. Five used OCA Facebook four times a week and one interviewee used OCA Facebook three days per week. On average, interviewees had used OCA Facebook for 14 months (SD=5.3).

Experiencing psychological well-being

This theme emerged when cancer-affected people reported feeling good, positive, happy, well supported, and hopeful as a result of OCA Facebook use. Interviewees felt that OCA Facebook use enabled them to be supported and experience positive mood and positive attitudes toward themselves. OCA Facebook use helped them to form satisfying relationships, meet their social needs and empowered them to resist cancer-related pressures and encouraged them to continue improvement in their health. The following extracts illustrate this point:

Using OCA Facebook makes me feel positive about myself. (Interviewee #1)

Using OCA Facebook made me good and I believe that I can overcome cancer-related pressures and fight with cancer. (Interviewee #5)

I could meet new people and get some friendship from it and I could make sense of information provided by my doctors. (Interviewee #21)

Factors that mediate the relation between OCA Facebook and psychological well-being

This third theme had four sub-themes: enhances social support, improves experiences of social connectedness, development of social presence and learning. The experiences of social connectedness sub-theme emerged from 80% of interviewees' transcripts; they showed that using OCA Facebook gave them a sense of belonging and enabled them to form satisfying relationships. For example, one interviewee noted that:

I feel I belong to the community that is specific for people like me and cares about me and I feel good about myself. (Interviewee #12)

The enhances reception of social support sub-theme emerged from 78% of interviewees' transcripts, which showed that the use of OCA Facebook enabled them to receive recommendations, advice, caring, understanding and empathy through chatting, creating and reading content, and observing posted content. These benefits led interviewees to feel well supported and able to resist social pressures. For example, interviewees noted that:

When doctors have told you that you might not make it to Christmas it doesn't give you much hope, but when you use OCA Facebook and read their hopeful quotes you say doctors are not God and they don't know what is going to happen so, yes, look, there is emotional support there and it does make you positive. (Interviewee #6)

I was talking to someone and commenting on her comments then she told me that there is a trial that I might be able to be involved to, there is so much information that you need. (Interviewee #4)

The learning sub-theme emerged from 65% of interviewees' transcripts, which showed that the use of OCA Facebook enabled them to learn new things and feel they were continuously developing. OCA Facebook use had an important influence on interviewees' thoughts, attitudes and learning. Learning new things from other members about what works and what doesn't work, and also the knowledge of similar situations in the past and present, helped them to feel more positive and encouraged them to continue development. The following is an example of participants' comments about learning:

I could learn healthy diets from other people on OCA Facebook and I could feel good and like to learn more. (Interviewee #20)

Using OCA Facebook helped me to learn about my illness and cancer risks, and I learned different ways to cope with my illness (Interviewee #5)

The development of social presence theme emerged from 72% of interviewees' transcripts, which illustrated that the use of OCA Facebook enabled them to develop understandable communication and have the sense of being with others. Participants believed that the use of OCA Facebook enabled them to feel the presence of others through obtaining private or public messages, "liking" comments, "tagging" photos and sharing content. They also noted that the technical features of Facebook enabled development of aural and visual communication with others, making them feel more satisfied and helping them to meet their social needs. The following example shows one interviewee's experience of social presence in the OCA Facebook environment:

Communication on OCA Facebook is completely understandable since you can use different tools for delivering your message, such as posting photos, conducting video chats, all of them that would decrease ambiguity which allows you to understand what you need and experience more pleasing feelings. (Interviewee #14)

4.6 Discussion

This study showed that the use of OCA Facebook was part of cancer-affected people's daily activity and had a positive impact on their psychological well-being, regardless of whether they used it actively or passively. Findings from this study extends previous research that showed the use of online health-related resources such as blogs and forums were associated

with the psychological well-being of breast cancer survivors,[113] and are consistent with those of studies that showed SNS use was integrated into students' lives and positively impacted their psychological well-being,[114, 115]. Interviewees reported the use of OCA Facebook enhanced their reception of social support, experiences of social connectedness, development of effective communication and learning – and ultimately increased their feelings of happiness, satisfaction, being well supported, positive attitudes and willingness to continue development, all indicators of psychological well-being, [116].

Interviewees had a sense of belonging to people in OCA Facebook. The use of OCA Facebook helped cancer-affected people to fulfil their social needs, achieve positive attitudes and form satisfactory relationships. This is consistent with belongingness theory and previous studies that found experiencing social connectedness in social environments is positively associated with a higher level of positive mood and greater psychological well-being, [117,118].

The use of the OCA Facebook enabled cancer-affected people to experience the feeling of being cared for, responded to and assisted by people in their social community, as well as feel positive and well supported. This is consistent with social support theory and studies which hold that these kinds of support are formed through individuals' connections and play an important role in keeping them informational and emotionally supported and enabling them to experience greater psychological well-being,[119].

OCA Facebook use enhanced the social presence of the cancer-affected participants. OCA Facebook enabled interviewees to use various online services for developing communication, informational and emotional support exchange. These services were video and audio chatting, photo tagging, and content-sharing tools that could support the use of natural language, and carry nonverbal and verbal cues that were associated with effective communication. As a

consequence, users reported feeling more satisfied and positive than before they began using OCA Facebook. This is in line with SPT, which holds that communication is effective if the medium can support the social presence required for a task, and also with previous studies showing a reciprocal relationship between an individual's social presence and satisfaction with life,[120].

The use of OCA Facebook helped cancer-affected people to learn new things through both passive and active use and be motivated to continue development. Findings are consistent with SCT, which explains that learning occurs through observing others' interactions and also developing interaction with others in a social environment,[121]. In addition, these findings are similar to those of previous research showing that individuals' learning resulting from their social ties was associated with greater well-being,[122,123].

Based on these findings, a theoretical model of OCA Facebook and the psychological well-being of cancer-affected people was proposed (Figure 4.3). OCA Facebook use is represented by intensity of use and type of use. Four mediating factors are shown: social support, social connectedness, learning and social presence. Through these mediating factors, OCA Facebook use is related to greater psychological well-being of cancer-affected people.

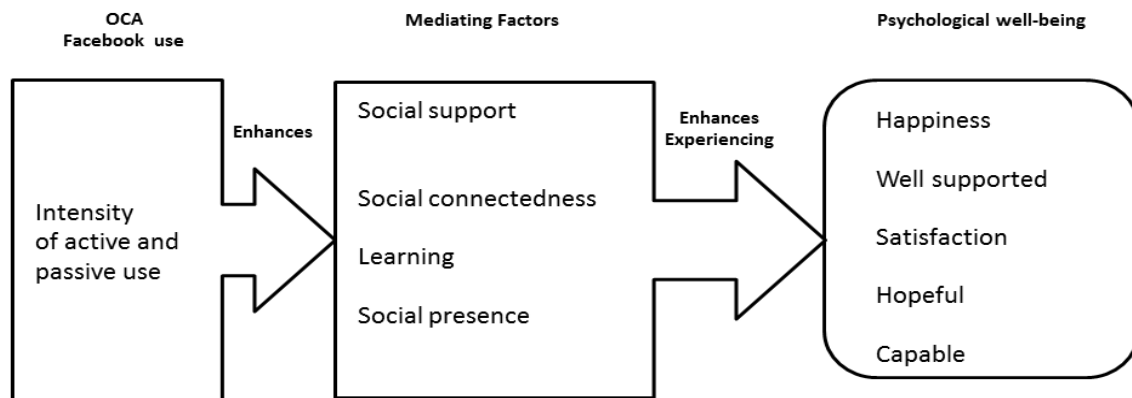


Figure 4.3. Theoretical model of OCA Facebook use and psychological well-being of cancer-affected people

In summary, this theoretical model shows that OCA Facebook use is positively related to psychological well-being. People affected by cancer who used OCA Facebook reported experiencing a higher level of social support than before they began using it', and thus felt positive and well supported. Results also showed that the use of OCA Facebook caused people affected by cancer to develop a greater a sense of belonging to the community, which helped them to feel pleased and meet their social needs. OCA Facebook use enabled users to feel the presence of like-minded people and to more clearly communicate with them, which in return helped them to feel more satisfied. In addition, OCA Facebook use enabled users to learn through interaction, observe interactions and feel more capable.

4.7 Conclusion and future research

This research assessed the relationship between the use of OCA Facebook and psychological well-being of ovarian cancer-affected people. The findings showed a positive relationship between Facebook use and psychological well-being mediated through social support, social connectedness, social presence and learning. The results will assist health organisations to

generate strategies for using Facebook for improving the psychological well-being of their users.

This study provided insights into the lived experience of cancer patients' use of Facebook. This contributes to a better understanding of the ways that SNS use is associated with the psychological well-being of cancer patients. By clarifying this relationship, this study demonstrates that SNS use does indeed have possibilities for promoting psychological well-being of cancer-affected people, arguing for the sustainability of Internet-based interventions and showing the advantages that SNS use can have in the context of healthcare, at least with respect to cancer-affected people. The findings should encourage organisations involved in the care of cancer patients, and cancer patients themselves, to use Facebook to improve their psychological well-being.

This paper found a positive relationship between Facebook use and the psychological well-being of its users and the strength of this relationship needs to be established. Future empirical studies should be conducted to quantitatively and longitudinally examine the relationship between Facebook use, its mediating factors and the psychological well-being of users. Organisations should consider introducing strategies for using Facebook as an online support resource to enhance individuals' psychological well-being.

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Interview questions

Why did you decide to use OCA Facebook? (Probe: needs, obtaining information, achieving emotional support, others).

How often do you use OCA Facebook?

How long in each session do you use OCA Facebook?

For how long do you use OCA Facebook?

How do you use OCA Facebook? (Probe: check news feed, chat, and post on the wall)?

How does OCA Facebook use influence you? (Probe: positive attitude toward self)?

How do you feel or what do you experience when/after you use OCA Facebook? How would you describe the person you are then? (Probe: happy, optimistic).

What is the main reason of having the mentioned feeling?

Do you feel satisfied from using OCA Facebook? If yes, why?

Could using OCA Facebook facilitate learning healthy behaviours? If yes, how? (Probe:, by interacting with members)

Could OCA Facebook use help you to resist social/cancer related pressure? If yes, how? If no why not?

Do you think OCA Facebook could be a source that increases your happiness? Why or why not?

Is there anything else that you would like to add that could help me to understand the role of cancer related Facebook use for people who have been impacted by cancer?

CHAPTER 5 (PAPER FOUR):

THE EFFECT OF SOCIAL NETWORK SITE USE ON THE
PSYCHOLOGICAL WELLBEING OF CANCER-AFFECTED PEOPLE

Several recent studies have called for the development of a clear understanding of the impact of SNS use on psychological wellbeing. (Guo et al., 2014; Reinecke & Trepte, 2014).

Abstract

Social Network Sites (SNSs) are growing in popularity and social significance. Although researchers have attempted to explain the effect of SNS use on users' psychological well-being, previous studies have produced inconsistent results. In addition, most previous studies relied on healthy students as participants, and therefore have ignored or have paid less attention to other cohorts of users. In particular little is known about the impact of SNSs use on the psychological well-being of people living with serious health condition.

In this study, we identified the factors derive from the use of SNSs and which improve cancer-affected people' psychological well-being. This study examined the impacts of Facebook use on the psychological well-being of cancer-affected people, specifically the members of Ovarian Cancer Australia (OCA) Facebook. Using online survey data collected from 154 cancer-affected people aged 18–60 tested a theoretical model with eight hypotheses. The theoretical model showed social support, social connectedness, social presence and learning mediates the positive impact of SNSs use on the psychological well-being of cancer-affected people.

The theoretical basis and empirically derived results from this study contributes to a better understanding of the ways and extent that SNS use is associated with psychological well-being of cancer-affected people. The findings should encourage organisations involved in the care of cancer-affected people, and cancer-affected people themselves, to use Facebook to improve their psychological well-being.

Keywords: Social Network Sites, Facebook, cancer-affected people, psychological well-being, social support, social connectedness, social presence, learning, theoretical model.

5.1. Introduction

Social network sites (SNSs) are networked communication platforms in which users can create profiles and content, establish connections, develop interactions with their connection, share content and consume content provided by their networks (Berger, Klier, Klier, & Probst, 2014; Ellison & Boyd, 2013). These user-oriented sites have attracted billions of people and are continually expanding (Min & Kim, 2015). The explosive growth of SNSs has made SNS use and its consequences increasingly popular topics for research (Ahn, 2011; Wilson, Gosling, & Graham, 2012; Huang, Hsieh, & Wu, 2014). In particular, the effect of SNS use on users' psychological well-being has not gone unnoticed by the academic community (Guo, Li, & Ito, 2014).

Psychological well-being is defined in the literature in terms of autonomy, personal growth, self-acceptance, life purpose, environmental mastery and positive relatedness (Ryff, 1989). Autonomy means being able to resist social pressures; personal growth refers to feelings of continued development; self-acceptance means holding positive attitudes toward oneself; life purpose is a sense of direction in life; environmental mastery is about feeling competent in creating context suitable to personal needs and values; positive relatedness is the extent to which one forms satisfying relationship with others. Psychological well-being can also be conceptualised as feeling happy, capable, well supported and satisfied with life (Huppert, 2009; Moyer, Goldenberg, Schneider, Sohl, & Knapp, 2014; Winefield, Gill, Taylor, & Pilkington, 2012).

SNSs have become an important part of many people's lives (Ellison & Boyd, 2013), and many users spend hours using SNSs each week or even day (Junglas, Goel, Abraham, & Ives, 2013); naturally, such extensive use of SNSs has implications for psychological well-being

(Reinecke & Trepte, 2014). Some studies have established correlations between the use of SNS and psychological well-being (Guo et al., 2014; Kalpidou, Costin, & Morris, 2011; Nabi, Prestin, & So, 2013); however the results have been inconsistent. Most previous studies have shown a positive relationship between the use of SNSs and individuals' psychological well-being (Guo et al., 2014; Nabi et al., 2013; Oh, Ozkaya, & LaRose, 2014), but a few studies were unable to support the existence of a positive relation (Kalpidou et al., 2011). Inconsistent results could be due to differences in research design (Samson & Terziovski, 1999), including insufficient theoretical justification for the relationship between SNS use and psychological well-being, or focus on different mediating variables that might predict psychological well-being derived from the use of SNSs (Oh et al., 2014). For example, Kalpidou et al. (2011) used the number of SNS friends as a direct predictor of users' psychological well-being and failed to detect a positive relationship. However, Nabi et al. (2013) showed the number of Facebook friends was related to the individual's perception of social support, which in turn was associated with greater psychological well-being (Nabi et al. 2013). Accordingly, recent studies have called for the establishment of a clear understanding of the impact of SNS use on users' psychological well-being (Oh et al, 2014; Reinecke & Trepte, 2014), and the development of a comprehensive theoretical model (Guo et al., 2014). Therefore, we aimed to develop a theoretical model that depicts the relationship between SNS use and the psychological well-being of cancer-affected people.

Most previous studies of the effect of SNSs use on psychological well-being used young and healthy students as their population sample. We selected cancer-affected people as the study population to investigate SNS use and psychological wellbeing because people living with serious health conditions could (theoretically) benefit greatly from SNS use. For example,

SNSs use can bring together patients to exchange health-related information and emotionally support others with similar health concerns (Farmer, Holt, Cook, & Hearing, 2009; Bender, Jimenez-Marroquin, & Jadad, 2011; Westbrook, 2015). Secondly, no research to date had specifically shown the relationship between SNSs use and improvement of cancer-affected people's psychological well-being (Hong, Pena-Purcell, & Ory, 2012; Erfani & Abedin, 2014). A diagnosis of cancer is a life-changing event and takes a great toll on a person's psychological well-being (Moyer et al., 2014). Developing knowledge and providing evidence of novel tools and technologies that can improve cancer patients' psychological well-being would be a major advance (Hong et al., 2012; McLaughlin et al., 2012).

In the next section we provide background to the research, followed by the research question. Next, we describe the research design and the theoretical foundation from which we developed our hypotheses. We then describe the online survey of SNS users that was used to empirically test the research model. Finally, we present and discuss the key findings, followed by avenues for future research, and our conclusions.

5.2 Research background

Researchers have demonstrated that SNSs such as Facebook can enhance information sharing (Pan et al., 2015; Zagaar & Paul, 2012; Zhitomirsky-Geffet & Bratspiess, 2014), information dissemination (Leong, Pan, Ractham, & Kaewkitipong, 2015), communication and information gathering (Thelwall & Wilkinson, 2010; Ellison & Boyd, 2013; Huang, Chu, & Chen, 2015), and the development of emotional support (Oh & Syn, 2015). Internet users are increasingly merging their online activities through SNSs (Yu, Tian, Vogel, & Kwok, 2010). SNS users can perform numerous activities – such as blogging, emailing, instant messaging

and photo sharing – on a single site such as Facebook (Erfani et al., 2013; Abedin & Jafarzadeh, 2015).

Facebook, the most popular SNS, launched in February 2004, and had more than 900 million active users in 2015. (eBizMBA, 2015). The rapid growth in the number of SNS users makes it important to examine their impact and their potential to improve psychological well-being (Guo et al., 2014). However, as mentioned earlier, most published studies have relied on students for investigating the relationship between SNS use and psychological well-being (Liu & Yu, 2013; Guo et al., 2014); non-student users of SNSs have not been adequately investigated to date (Nabi et al., 2013).

Cancer-affected people use SNS such as Facebook for informational and emotional exchange (Farmer et al., 2009). Facebook enables cancer-affected people to share cancer-related information by posting content on their own message board, called a wall, or commenting on posted contents on others' walls. Cancer-affected people spread wall posts such as links to new findings; cancer-related events and new drug trials via information distribution functionality such as "share", needing only a single click (Bender et al., 2011; Erfani et al., 2013). They also disseminate cancer related information through tagging engagement (Erfani et al., 2013). Tagging engagement refers to "the act of tagging oneself and one's friends in photos or posts, as well as being tagged by friends in photos or posts" (Wisniewski, Xu, Lipford, & Bello-Ogunu, 2015 p.2). Facebook enables cancer-affected people to provide emotional support for each other by positing positive messages and liking content. Cancer-affected people use various messaging services, including public and private messaging. They use public messaging services for communication and making sense of data, and private messaging services for discussing sensitive issues that they might not be able to explore in a

face-to-face environment (Erfani et al., 2013a). SNSs such as Facebook are accessible through various communication platforms, including smartphones, tablets and laptops (Xu, Ryan, Prybutok, & Wen, 2012). The pervasive nature of Facebook, its unique features to support extensive interactions, and its accessibility through web-enabled devices makes it an ideal tool for people with mobility problems or people who are unable to interact normally due to their illness (Erfani, Abedin, & Daneshgar, 2013).

Despite the clear benefits of SNSs for health, research in SNSs and psychological wellbeing lacks a clear theoretical basis and empirically derived evidence for integrating these tools and data into existing health programs and systems. While the effect of other dynamic health-related web-based applications (Web 2.0) such as, blogs and forums, on the psychological well-being of cancer patients has been examined (Gustafson et al., 1994; Klemm, Hurst, Dearholt, & Trone, 1998), little is known about the impact of SNS use on the psychological well-being of cancer-affected people (Erfani & Abedin, 2014; Hong et al., 2012). In addition, although researchers have examined the impact of other Web 2.0 applications on the psychological well-being of cancer patients, research on the theoretical underpinnings of online cancer support is sparse (Hong et al., 2012). In this study, we addressed the fundamental question: In what ways and to what extent does SNS use impact the psychological well-being of cancer-affected people?

5.3 Research design

We adopted a mixed-methods approach to answer our research question. We conducted semi-structured interviews with users of the Ovarian Cancer Australia Facebook to assess the ways in which SNS use impacts their psychological well-being. Drawing on an extensive literature review, concepts of social support, belongingness theory, sociocultural theory and social

presence theory and the results of our interviews, we explained the relationship between the use of SNS and psychological well-being of cancer-affected people and developed a theoretical model. Then we empirically validated the factors through a quantitative survey and empirically revealed the extent to which SNS use impacts the psychological well-being of cancer-affected people. The theoretical basis and empirically derived results together constitute a new and better understanding of the impact of SNSs on users' psychological well-being.

5.3.1 Case study and sample

We adopted case study research methodology because it is appropriate for developing in-depth knowledge (Yin, 2013). We chose OCA Facebook as our research platform because it is used by large numbers of cancer-affected people for informational and emotional purposes (Erfani et al., 2013b). In February 2014 OCA Facebook had 9,499 members, with an average of 16 posts, 40 comments, and 15 shares every week, suggesting it is an active online environment (Hajli, 2014a).

OCA Facebook is maintained and moderated by Ovarian Cancer Australia, an independent national organization that supports people affected by ovarian cancer. OCA Facebook provides cancer-affected people with support, offers authoritative cancer-related information, promotes cancer awareness events, and suggests positive behaviours to stay healthy while living with cancer. OCA Facebook also enables people affected by ovarian cancer to connect and exchange details about their conditions, treatments and symptoms, and support one another. Commercial and unrelated content and negative comments and posts are not permitted.

5.3.2 Interview process and participants

We obtained ethical approval from Macquarie University's ethics committee in November, 2013, then contacted the OCA Facebook administrator for permission to post an invitation to users of the OCA Facebook page to participate in an interview. Interviewees had to be over the age of 18 and have used OCA Facebook for more than two months. Interviewees were self-selected. Twenty-five women who were affected by ovarian cancer (mean age=39 years, median=41 years, SD=5.6) and were users of OCA Facebook were interviewed. Semi-structured interviews were chosen to give the interviewer freedom to modify the format and order of questions as appropriate (Creswell, 2013). The interviews were conducted via telephone, Skype and face-to-face depending on participant preference, in February and March 2014. Interviewees were asked 13 open-ended questions (Appendix I) to gather feedback on participants' experiences with using OCA Facebook, their assessments of their mental health states after using OCA Facebook, and their perceptions of the usefulness and helpfulness of OCA Facebook. Interviewees also estimated the amount of time they spent on OCA Facebook (frequency, duration), and described their history of OCA Facebook use and the specific activities they undertook while using OCA Facebook. Interviews took around 45 minutes and were audiotaped with permission from the interviewees. The interviews were transcribed for qualitative data analysis.

5.3.3 Data analysis and summary of findings from interviews

Thematic analysis, the process of collecting candidate themes and creating relationships between themes, was used to identify, analyse and report themes, (Kuch, 1982; Vaismoradi, Turune, & Bondas, 2013). Responses were coded in six phases: familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes,

and producing the final reports. We uploaded each transcript to NVivo and read it several times before coding began. We reviewed each transcript to become familiar with the data and to identify responses to each interview question. This was followed by a synthesis phase in which we identified the categories linked to the research objectives; particular attention was paid to the ways that interviewees used OCA Facebook and how this related to their psychological well-being. Concepts (explanatory ideas) were identified from the data and given a label or code that described them. The text was divided into meaning units that were then condensed. The condensed meaning units were abstracted and labelled with code. The various codes were compared and sorted into nodes in NVivo. Thematic analysis of interviewees' responses to the open-ended questions discovered three themes: (1) Active and passive use of OCA Facebook (active use refers to activities such as chatting, liking, creating content and sending messages, while passive use includes observing the content and monitoring posts), (2) factors that mediate the relationship between OCA Facebook use and the psychological well-being of cancer-affected people (using OCA Facebook supported interviewees to experience a sense of belonging and a sense of being with others, and enabled them to obtain advice and support, allowed them to develop effective communication as well as gain knowledge and learn) (3) experiencing psychological well-being (interviewees reported they could experience happiness, satisfaction, positive affect and being well supported, and also could develop satisfactory friendships with members of OCA Facebook and were willing to continue growth in their health condition).

The summary of descriptive results is presented in Figure 5.1. Further findings from the interviews were used to develop the theoretical model, and are discussed in the following section.

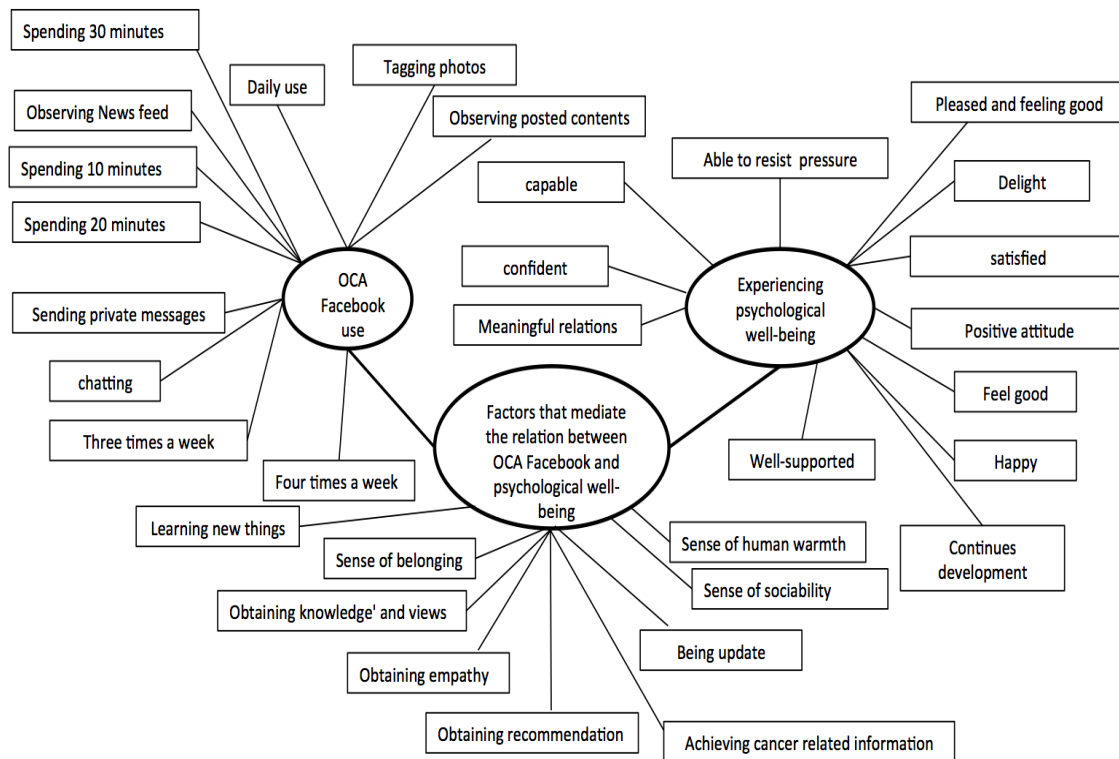


Figure 5.1. Thematic map of OCA Facebook use and psychological well-being

5.4 Research model and hypotheses

This section outlines a theoretical model with eight hypotheses developed from the literature and combines them with findings from our interviews to outline the relationship between SNS use and the psychological well-being of cancer-affected people

Social Support. A recurring central theme within the literature and our interviews is the role of SNSs in developing social support. Social support theory helps to explain how interactions through computer-mediated communication can offer health related benefits (Morrison,

2015). Shumaker and Brownell (1984) defined social support as “an exchange of resources between two individuals perceived by the provider or recipient to be intended to enhance the well-being of the recipient” (p.13). Cutrona and Suhr (1992) listed five different types of social support: esteem support, emotional support, tangible support, network support and informational support. Esteem support refers to expressions of positive communication behaviours for support seekers’ skill. Emotional support refers to expressions of caring, sympathy, listening, understanding, empathy, and encouragement. Network support refers to expressions of companionship and connection. Tangible or instrumental support is the provision of needed goods and services. Informational support refers to guidance, advice, facts, stories of personal experience, opinions and referrals to other sources of information and information that aims to eliminate or solve support seekers’ problems or help in evaluating situations (Chang, 2009). Informational support and emotional support are two main types of social support offered in online health communities (Cobb, 1976; Hajli, 2014; Zhang & Yang, 2015). Studies have shown social support to be a product of social connections (Chuang & Yang, 2014; Lin, Hsu, Cheng, & Chiu, 2015; Zhang & Yang, 2015) and a predictor of health outcomes, such as well-being (Bui, Yen, & Honavar, 2015; Wright, 2012).

Rubenstein (2014) showed information and emotional support were frequently exchanged among members of an online breast cancer community. In a study of the influence of social support on quality of life measures (including emotional and social well-being) in 3,139 women who were diagnosed with and survived breast cancer from 2006 to 2011, greater social support was found to be related to higher emotional and social well-being after diagnosis (Kroenke et al., 2013). A longitudinal content analysis of more than 33,200 postings from an online breast cancer bulletin board showed a positive relationship between participation in

Internet-based groups and the psychosocial well-being of cancer patients (Rodgers & Chen, 2005).

Evidence of informational and emotional support was present in our interview findings. Cancer-affected people reported that they experienced more informational and emotional social support through using OCA Facebook than before they began using it. They began to feel well supported, positive and able to resist social pressures. For example, one of the interviewees said:

When doctors have told you that you might not make it to Christmas it doesn't give you much hope, but when you use [OCA Facebook] and read their hopeful quotes you say doctors are not God and they don't know what is going to happen so, yes, look, there is much caring and understanding there and it does make you feel positive. (Interviewee #6)

Another interviewee noted: I was talking to someone and commenting on her comments then she told me that there is a trial that I might be able to be involved to, there is so much information that you need. (Interviewee #4)

Given the above findings, we propose that:

H1: Facebook Use by cancer-affected people positively impacts their Social Support.

H2: Social Support positively impacts the Psychological Well-being of cancer-affected people.

Social Connectedness. Social connectedness is described as emotional connectedness and a sense of belonging between an individual and other people (Pearson, Carmon, Tobola, & Fowler, 2010) that is formed through social connections and supportive interactions (Abubakar, Van de Vijver, Mazrui, Murugami, & Arasa, 2014). It is closely related to belongingness theory, as first posited by Baumeister and Leary (1995), which states

individuals develop meaningful relationships to experience a sense of belonging and consequently experience greater psychological well-being. Studies have shown a positive correlation between the integration of SNS and social connectedness (Utz, 2015) that promotes well-being (Agosto, Abbas, & Naughton, 2012). Morris et al. (2014) showed participating in online support groups enabled cancer survivors to experience a sense of belonging. Another study examined the psychosocial benefits of Internet community group participation for women with breast cancer (Rodgers & Chen, 2005). This study showed breast cancer survivors could experience a sense of belonging in online discussion groups and ultimately experience greater emotional well-being (Rodgers & Chen, 2005).

Findings from our interviews support the above assertions. Our interviewees noted that OCA Facebook use enabled them to experience social connectedness and ultimately develop satisfying relationships with other people in OCA Facebook and feel happy and positive. For example, one of our interviewees noted: I feel I belong to the community that is specific for people like me, I could meet new people and get some friendship from it and I could make sense of information provided by my doctors and feel good and happy. (Interviewee #21). This evidence led us to propose the following hypotheses:

H3: Facebook Use by cancer-affected people positively impacts their Social Connectedness.

H4: Social Connectedness positively impacts the Psychological Well-being of cancer-affected people.

Learning. Sociocultural Theory (SCT) states learning as a social process (Lantolf, 1994). The concept of regulation derives from sociocultural theory where learners are said to progress from other regulation to self-regulation. According to SCT successful learning involves moving from object and other regulation to self-regulation. Object regulation is the stage that

learners start to learn by the object they observe in a social environment. Other regulation stage is when learners start to learn exerts control over action by obtaining assistant and receiving feedback from peers or mentors in a social environment. Self-regulation stage is when learner becomes competent enough to preform independently (Lantolf, 1994). Learning outcomes span three domains: cognitive, affective and skill-based (Schmidt & Ford, 2003). Cognitive learning includes gaining knowledge and comprehension. The affective domain refers to emotional learning and the ability to deal with situations such as individuals' satisfaction, self-esteem and appreciation of the learning experience. The skill-based domain of learning outcomes refers to the expansion of critical thinking to solve problems (Schmidt & Ford, 2003). Du, Hao, Kwok and Wagner (2010) state, "Effective learning is a process of guided individual self-practice with both explicitly and implicitly reinforced peer-influence" (p.2133).

Researchers reported that the learning that occurred in computer-mediated support groups for women with breast cancer was associated with improved health outcomes (Shaw, Hawkins, McTavish, Pingree, & Gustafson, 2006). Studies of interactive cancer communication systems showed breast cancer patients using the Comprehensive Health Enhancement Support System learned different ways on how to take charge of their treatment, and ultimately experienced better psychological well-being (Gustafson et al., 1994).

In line with the above findings, our interviewees reported that the use of OCA Facebook enabled them to learn new things about what works and what doesn't, as well as acquire knowledge of similar situations in the past and present, gain the ability to deal with cancer-related problems and consequently feel more positive and be encouraged to continue development. For example, one of the interviewees noted: Using OCA Facebook enabled me

to learn about my illness and cancer risks, and I learned different ways to cope with my cancer and I like to learn more. (Interviewee #20)

Based on this evidence, we developed the following hypotheses:

H5: Facebook Use by cancer-affected people positively impacts their Learning.

H6: Learning positively impacts the Psychological Well-being of cancer-affected people.

Social Presence. Social presence is defined as the degree of salience of the other person in the interaction (Short, Williams, & Christie, 1976), a sense of human contact and experience of others' presence in a social environment (Lee, Kozar, & Larsen, 2009; Ning Shen & Khalifa, 2008; Biocca, Harms, & Burgoon, 2003). Social Presence Theory (SPT) postulates that communication is effective if the medium has the social presence appropriate for the level of interpersonal involvement required for a task (Short et al., 1976). According to SPT, the degree of social presence varies in different media depending on its capability for rapid feedback, conveying non-verbal cues, and reducing communication ambiguity.

Liu, Cheung, and Lee (2015) showed a positive link between experiencing social presence and enhancing users' satisfaction. Studies on Internet-based communication systems showed that participating in online cancer-related discussion groups enabled cancer patients to experience social presence that was related to emotional well-being promotion (Walther, Pingree, & Hawkins, 2005). Similarly, findings from our interviews showed that the use of OCA Facebook enabled our interviewees to feel the presence of others through receiving private or public messages, liking comments, tagging photos, sharing content and poking. Our interviewees also acknowledged the technical features of Facebook that enabled them to conduct aural and visual interaction with others, helped them to experience sociability, human

warmth and understandable communication. The latter made them feel more satisfied and helped them to meet their social needs. For example, one of the respondents pointed out that: Communication on OCA Facebook is completely understandable since you can use different tools for delivering your message, such as posting photos, having video chats which allows you to understand what you need and experience more pleasing feelings. (Interviewee #14)

The above discussion led to the following hypotheses:

H7: Facebook Use by cancer-affected people positively impacts their Social Presence.

H8: Social Presence positively impacts the Psychological Well-being of cancer-affected people.

Figure 5.2 presents the theoretical model of this research. This model is a summary of the theoretical perspectives on the proposed relationship between the use of Facebook by cancer-affected people and its impact on their psychological well-being. As this theoretical model shows, the use of OCA Facebook is expected to contribute positively to cancer-affected people's social support, learning, social connectedness and social presence, which will consequently impact their psychological well-being.

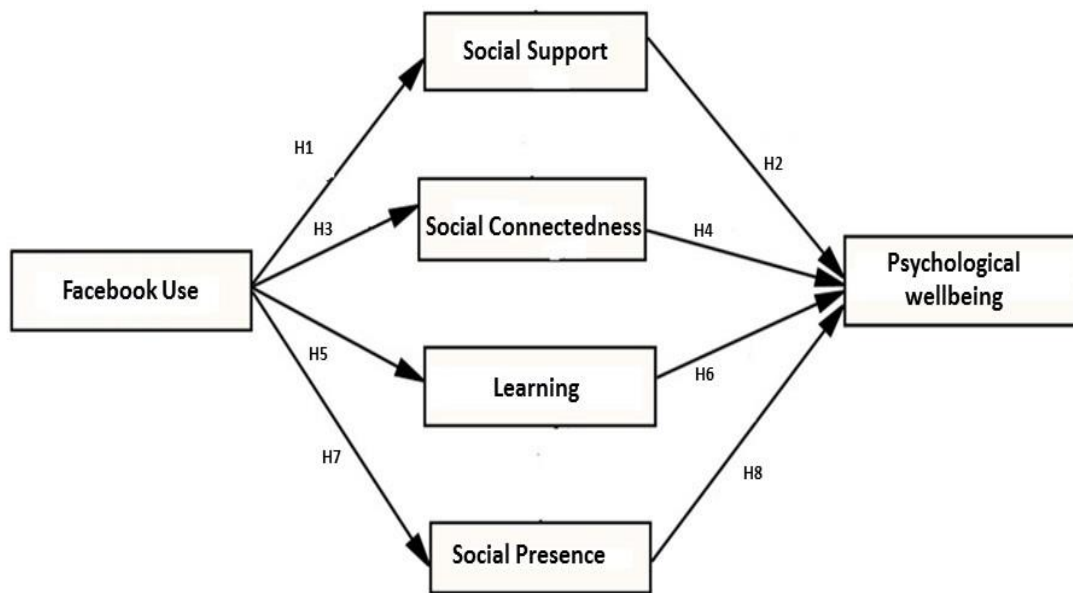


Figure 5.2. Theoretical model of OCA Facebook use and Psychological Well-being of cancer-affected people

5.5 Measurement Instruments

An online survey was used to collect the data and test the theoretical model. This section outlines the measurement instruments, data collection, data analysis, demographics and descriptive statistics, validity and reliability analysis, and the testing of the theoretical model. First we reviewed the field studies with the overall intention of capturing cancer-affected people's perceptions of the impact of using OCA Facebook on their psychological well-being. The objective was to look for questionnaire, which could cover the topic, had evidence of validity and reliability, and would be suitable for self-completion by OCA Facebook users. A group containing the possible items was developed for the evaluation of Facebook use, social support, social connectedness, social presence, learning and psychological well-being of

cancer-affected people. The instruments identified are listed in Table 5.1. Indicators for each construct were listed, then indicators were merged when two or more indicators had exact or similar names and/or definitions, or their corresponding definition reflected the same concept. Content validity of measures was evaluated. Content validity refers to the extent to which empirical measurements reflects a specific domain of content. According to Bollen (2014), content validity is a qualitative type of validity in which the analyst judges whether the measure fully represents the domain. To ensure the content validity of all the measurements, 10 experts in information systems, health and psychological well-being were consulted for comments and suggestions on the constructs and the questionnaire. After analysing their feedback, some minor revisions were made.

The final questionnaire used seven items for representing Facebook Use, five items for Social Connectedness, five items for Social Support, five items for Social Presence, four items for Learning, and seven items for Psychological Wellbeing (AppendixII).

Table 5.1. Previous relevant instruments and constructs

Construct/Study	Brief overview of measurement target and mode
Facebook use	
Ellison et al., 2007	Measuring Facebook intensity
Xu et al., 2012	Measuring social network site usage
Burke, Marlow, & Lento, 2010	Measuring type of social network site usage
Social connectedness	
Grieve et al., 2013	Measuring social connectedness in online communities
Lee et al., 2000	Measuring social connectedness for psychological outcomes
Van Bel, Smolders, Ijsselstein, & de Kort, 2009	Measuring social connectedness in different communication systems
Learning	
Yu et al., 2010	Measuring learning in online social networking sites
Jenkins, 2011	Measuring the effect of learning on well-being
Social support	
Lin et al., 2015	Measuring social support in an online environment
Eastin & LaRose, 2005	Measuring social support in online communities
Oh et al., 2014	Measuring social support in social network sites
Social presence	
Gefen & Straub, 2003	Measuring social presence in online communities
Richardson & Swan, 2003	Measuring social presence in an online environment
Xu et al., 2012	Measuring social presence in social network sites
Psychological well-being	
Ryff, 1989	Measuring psychological well-being in terms of self-acceptance, positive relatedness, autonomy, environmental mastery, purpose of life, personal growth
Winefield et al., 2012	Measuring psychological well-being in terms of happiness and satisfaction with life

An exploratory factor analysis (EFA) was conducted to uncover the underlying structure of the items of the abovementioned constructs. SPSS version 22.0 was used to perform an EFA using principal component extraction. Bartlett's test for sphericity and the Kaiser–Meyer–Olkin (KMO) test of sampling adequacy were performed to assess the appropriateness of the factor analysis. As there is little literature available about possible correlations between constructs, a commonly used factoring extraction method with the PROMAX rotation solution was chosen for this analysis.

The KMO statistic varies between 0 and 1; Cook & Thompson (2000) suggested a value greater than 0.5 is acceptable and shows the sample is adequate for factor analysis. KMO values for our data were between 0.8 and 0.9. According Streiner (2013), for factor analysis to work, Bartlett's test should be significant (less than 0.05). Bartlett's test confirmed the existence of meaningful correlations among indicators (with sig. 0.000).

The EFA was carried out in three steps. First, indicators with extraction and initial commonalities less than 0.5 were excluded from the analysis. This was to ensure the selection of items with extracted constructs that explained a high level of variance (Fabrigar et al., 1999). Second, extracted factors with fewer than three indicators with loadings greater than 0.4 were removed from the analysis to prevent selection of factors representing only one or two indicators (Williams et al., 2012). Third, the reliability of the extracted factors was examined. For each extracted factor, the indicators which had a negative effect or did not have a large positive effect on reliability were excluded from the analysis. This criterion prevents selection of items that do not contribute highly to the reliability of the corresponding factors (Kankanhalli et al., 2005). The EFA resulted in excluding one or more items from each

construct, primarily due to each item's low contribution to its corresponding construct's commonality.

OCA Facebook Use. EFA of the seven selected items for measuring OCA Facebook use resulted in the exclusion of two items because its initial commonalities were less than 0.5. This left five items to measure OCA Facebook use that cumulatively explained 60.3% of the variances' communalities. Accordingly, OCA Facebook use was measured using five items (Cronbach's $\alpha = .82$).

Social Connectedness. EFA on the five selected items for measuring social connectedness resulted in four items with initial commonality greater than 0.5. Accordingly, four items were used to measure social connectedness, cumulatively explaining 63.4% of the variance (Cronbach's $\alpha = .87$).

Social Support. EFA on the five selected items for measuring social support resulted in excluding one item due to commonality lower than 0.5. The remaining four items cumulatively explained 60.4% of the variance with high reliability (Cronbach's $\alpha = 0.83$).

Social Presence. Of five items for measuring social presence, one was excluded due to initial commonality of less than 0.5. Four items were left, which cumulatively explained 61% of the variances with reliability (Cronbach's α) of 0.81. This scale consisted of positive and negative items. Negative items were reverse scored so that higher scores indicated higher levels of social presence.

Learning. Of four items for measuring learning, initial commonality for all items were greater than 0.5. Four items were left which cumulatively explained 61.1% of the variance (Cronbach's $\alpha = .81$).

Psychological Well-being. EFA of seven selected items for measuring psychological well-being resulted in excluding one item due to initial commonality of less than 0.5. Six items were used to measure social connectedness, which cumulatively explained 62.7% of the variance (Cronbach's $\alpha = .90$). This construct was measured with positively and negatively worded items, with reverse coding so that higher scores indicated higher levels of psychological well-being.

5.6 Data collection

Data was collected through a questionnaire posted on OCA Facebook between May and August 2014. There was only one follow-up. A summary of the research proposal and a link to the survey was posted on the OCA website, as well as OCA Facebook, to invite people affected by cancer to participate in the survey. In order to be eligible to participate in the survey, respondents had to be over the age of 18, and have been a user of OCA Facebook for more than two months. This ensured that members had a good level of experience and familiarity with OCA Facebook. Informed consent was obtained from all respondents, who were informed that they could terminate participation at any time during the research. No personal or identifiable information was collected. A total of 163 responses were received, of which nine were ineligible or inadequate: two did not meet the criteria of age and minimum time of OCA use, two gave incomplete responses, and five "unengaged" respondents (who had no variance in their responses) were excluded. The remaining 154 responses were used to test the model. Non-response bias was measured by comparing the responses of early and late responders. We split the sample into two halves based on the time when each response was received (Sivo, Saunders, Chang, & Jiang 2006). We then compared the early response group with the late response group in terms of respondents' demographics (age and OCA Facebook

use experience) and their responses regarding constructs. The average ages for the early and late responders were 38.2 and 38.1, respectively, not significantly different ($t = 0.21$). The average OCA Facebook use experience (in months) for the early and late responders was 14.5 and 13.8 respectively, again not significantly different ($t = 1.13$). The t -values for the responses on constructs ranged from 1.02 to 0.61, indicating no significant difference. We therefore concluded that nonresponse bias was not a significant threat.

Demographics and descriptive statistics

Responses came from all six Australian states, as well as New Zealand and the UK. A third of the respondents (33%) were women aged 36 to 45 years old. Over a third of respondents (35%) had used OCA Facebook for more than 12 months but less than 17 months. Respondent mean age was 38 years, with a mean of 14 months of use of OCA Facebook. The respondents' demographic backgrounds are summarised in table 5.2.

Table 5.2. Demographics and Descriptive Statistics

Participants' Characteristics	(%)
Age	
18-25	12
26-35	20
36-45	33
46-55	25
56-65	10
Months using OCA Facebook	
2-5	10
6-11	21
12-17	35
18-23	22
>24	12

5.7 Data analysis

Data analysis was conducted in two steps. In the first step, the reliability and validity of the constructs were assessed to ensure the appropriateness of the measurement model. In the second step, the hypotheses were examined (Kankanhalli et al., 2005). This two-step approach establishes the reliability and validity of the measures before the structural relationship of the model is assessed.

5.7.1 Validity and reliability analysis

Construct reliability is the degree to which a research instrument (questionnaire) gives consistent results. A value of Cronbach alpha greater than 0.7 suggests good reliability (Gefen & Straub, 2000; Sun, Wang, Yin, & Zhang, 2015). Cronbach's α values are shown in Table 5.3; all were higher than 0.80, exceeding the cut-off point for confirmatory research (Markus, 2012).

Table 5.3. Construct reliability

Construct	Cronbach's α
OCA Facebook use	0.82
Social presence	0.81
Learning	0.81
Social connectedness	0.87
Social support	0.83
Psychological well-being	0.90

Next, the validity of the measurement models was tested. Validity refers to the accuracy of an instrument in measuring what it is trying to measure (Byrne, 2013). A confirmatory factor analysis was conducted to check the construct validity (Arbuckle, 2013). The fit indices used

in this study to estimate measurement models were the Comparative Fit Index (CFI), Goodness of Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI). These fit indices were chosen because of their ability to adjust for model complexity and degrees of freedom. According to Hu and Bentler (1999), 0.90 is an acceptable minimum for GFI. CFI values of 0.95 are considered an excellent fit, while 0.80 is acceptable. A value of less than 5 is recommended for the CMIN/DF index, and a more conservative value 3 is suggested for the CMIN/DF index (Kline, 2006; Hu et al., 2013). A minimum cut-off of 0.80 is recommended for the AGFI index (McDonald & Ho, 2002). As Table 5.4 shows, the results of the factor analysis for construct loading and goodness-of-fit statistics relating to each measurement model assure a satisfactory fit.

Table 5.4: Validity measures

Constructs and items	Factor Loading
OCA Facebook Use	
On average every day I use the Ovarian Cancer Australia Facebook	.723
For each log session, I use Ovarian Cancer Australia Facebook for a long time	.778
On Ovarian Cancer Australia Facebook, I often post something	.736
On Ovarian Cancer Australia Facebook, I often view something	.697
On Ovarian Cancer Australia Facebook, I often reply to others	.671
Goodness-of-fit of the model: CIMIN: 2, AGFI: .99, CFI: .98, GFI: .99	
Social support	
Members of the Ovarian Cancer Australia Facebook tell me what they did in a situation similar to mine	.848
Members of the Ovarian Cancer Australia Facebook offer me suggestions and advice about how to cope with cancer related problems	.822
Members of the Ovarian Cancer Australia Facebook care about my cancer related concerns and worries	.818
Members of the Ovarian Cancer Australia Facebook care about my feelings and my health conditions	.633
Goodness-of-fit of the model: CIMIN: 2.1, AGFI: .91, CFI: .97, GFI: .97	
Social Connectedness	
I feel close to people on the Ovarian Cancer Australia Facebook	.620
I am not understood by members of the Ovarian Cancer Australia Facebook	.903
I see people as friendly and approachable on the Ovarian Cancer Australia Facebook	.753
I am comfortable around other members on the Ovarian Cancer Australia Facebook	.906
Goodness-of-fit of the model: CIMIN: 2, AGFI: .93, CFI: .96, GFI: .97	
Learning	
Using the Ovarian Cancer Australia Facebook makes me feel competent in adopting healthy behaviours	.650
Using the Ovarian Cancer Australia Facebook makes me feel that I am able to do things as well as other people	.832
Using the Ovarian Cancer Australia Facebook helps me to have a positive attitude toward myself	.690
Using the Ovarian Cancer Australia Facebook makes me feel satisfied with myself	.687
Goodness-of-fit of the model: CIMIN: 2.3, AGFI: .92, CFI: .96, GFI: .97	
Social Presence	
There is a sense of sociability in the Ovarian Cancer Australia Facebook	.764
I hardly notice the other individuals on the Ovarian Cancer Australia Facebook	.701
I understand others' communication on the Ovarian Cancer Australia Facebook	.616
My interaction with other members on the Ovarian Cancer Australia Facebook is clear and understandable	.782
Goodness-of-fit of the model: CIMIN: 2, AGFI: .96, CFI: .97, GFI: .97	
Psychological well-being	
I like to make improvement in my health	.833
I don't feel remote from others	.768
I am capable of improving my health	.738
I can control cancer related irritations	.899
I am good at dealing with cancer related problems	.716
I lack companionship	.783
Goodness-of-fit of the model: CIMIN: 2, AGFI: .91, CFI: .98, GFI: .96	

According to Cook and Campbell (1979), an instrument has convergent validity if the correlations between measures of the same construct using different methods are high. A test of each item's coefficient was used to assess convergent validity. If each item's coefficient is greater than twice its standard error, then measures indicate high convergent validity (Bagozzi & Heatherton, 1994; Hoskisson, Hitt, Johnson, & Moesel, 1993). The standard error of each retained item is presented in Table 5.5. All t-values are significant, indicating high convergence validity.

Table 5.5: Convergent validity of constructs

Constructs	Loading Factor	Standard error
OCA Facebook Use		
On average every day I use the Ovarian Cancer Australia Facebook	.723	
For each log session, I use Ovarian Cancer Australia Facebook for a long time	.778	.137
On Ovarian Cancer Australia Facebook, I often post something	.736	.139
On Ovarian Cancer Australia Facebook, I often view something	.697	.126
On Ovarian Cancer Australia Facebook, I often reply to others	.671	.136
Social Support		
Members of the Ovarian Cancer Australia Facebook tell me what they did in a situation similar to mine	.848	
Members of the Ovarian Cancer Australia Facebook offer me suggestions and advice about how to cope with cancer related problems	.822	.164
Members of the Ovarian Cancer Australia Facebook care about my cancer related concerns and worries	.818	.169
Members of the Ovarian Cancer Australia Facebook care about my feelings and my health conditions	.633	.157
Social Connectedness		
I feel close to people on the Ovarian Cancer Australia Facebook	.620	
I am not understood by members of the Ovarian Cancer Australia Facebook	.903	.142
I see people as friendly and approachable on the Ovarian Cancer Australia Facebook	.753	.124
I am comfortable around other members on the Ovarian Cancer Australia Facebook	.906	.136
Learning		
Using the Ovarian Cancer Australia Facebook makes me feel competent in adopting healthy behaviours	.650	
Using the Ovarian Cancer Australia Facebook makes me feel that I am able to do things as well as other people	.832	.179
Using the Ovarian Cancer Australia Facebook helps me to have a positive attitude toward myself	.690	.168
Using the Ovarian Cancer Australia Facebook makes me feel satisfied with myself	.687	.157
Social Presence		
There is a sense of sociability in the Ovarian Cancer Australia Facebook	.764	
I hardly notice the other individuals on the Ovarian Cancer Australia Facebook	.701	.120
I understand others' communication on the Ovarian Cancer Australia Facebook	.616	.120
My interaction with other members on the Ovarian Cancer Australia Facebook is clear and understandable	.782	.123
Psychological well-being		
I like to make improvement in my health	.833	
I don't feel remote from others	.768	.088
I am capable of improving my health	.738	.072
I can control cancer related irritations	.899	.083
I am good at dealing with cancer related problems	.716	.081
I lack companionship	.783	.016

Discriminant validity was tested to assess to what degree measures of different constructs were discrete (Arazy & Kopak, 2011; Hoskisson et al., 1993). According to Crocker and Algina (1986), discriminant validity is present if the correlations between measures of different factors using the same method of measurement are lower than the reliability coefficients. Cronbach's α and the bivariate correlations between the six constructs in our research model are presented in Table 5.6. All correlation coefficients are lower than the reliability coefficients, suggesting that all constructs in our research model are discrete.

Table 5.6. Cronbach's α , and bivariate correlations for the variables in research model

Variables	1	2	3	4	5	6	Cronbach's
Social presence	1.00						0.81
Psychological well-being	.739**	1.00					0.90
Learning	.778**	.770**	1.00				0.81
Social connectedness	.716**	.736**	.744**	1.00			0.87
Social support	.785**	.713**	.706**	.772**	1.00		0.83
OCA Facebook use	.756**	.766**	.756**	.714**	.669**	1.00	0.82

Note: ** Significant at the 0.05 level; *** Significant at the 0.01 level.

5.7.2 Testing the theoretical model

Results of fitness indices show an adequate model fit. The achieved CFI for the model was 0.95, which indicates an excellent fit. Also, a GFI of 0.92, AGFI of 0.82, and CMIN/DF of 3 were achieved, which again indicated satisfactory results (Steiger & Lind, 1980). Structural equation analysis (Figure 5.3 and Table 5.7) showed that Facebook use positively impacts on the four mediating factors (social support, social connectedness, Learning and social presence), and consequently has a positive impact on cancer-affected people's psychological well-being. A series of Sobel tests was carried out to assess the significance of indirect effects

between the variables in the model. For the indirect effect of OCA Facebook use on psychological well-being, mediated by social support ($p < .001$). Social connectedness also significantly mediated the effect of OCA Facebook use on psychological well-being ($p < .001$). In addition, the effects of OCA Facebook use were significantly mediated by social presence ($p < .05$), as well as by learning ($p < .001$). Thus, Sobel tests confirmed the four mediating factors significantly mediated the effect of OCA Facebook use on psychological well-being (Baron & Kenny, 1986). Table 5.7 and Figure 5.3 show the results support all the research hypotheses. To recap, OCA Facebook use has a positive influence on social support (hypothesis 1), and the same positive and significant relationship exists between social support and psychological well-being, confirming hypothesis 2. The statistically significant relationship between OCA Facebook use and social connectedness supports hypothesis 3, and that between social connectedness and psychological well-being supports hypothesis 4. Similarly, significant positive relationships were identified between OCA Facebook use and learning (hypothesis 5) and between learning and psychological well-being (hypothesis 6). Finally, a positive and significant relationship between OCA Facebook use and social presence

confirms hypothesis 7, and the significant relationship between social presence and psychological well-being supports hypothesis 8.

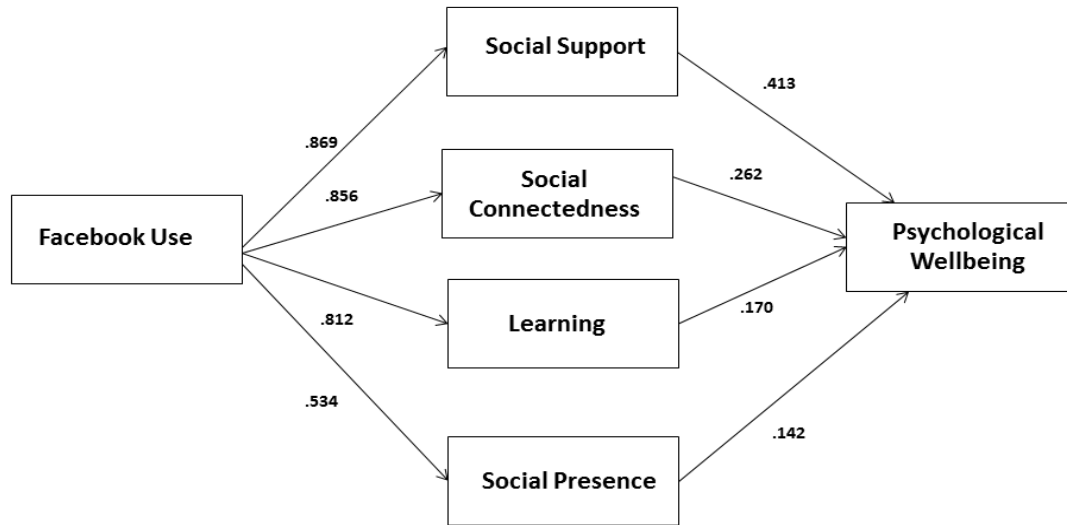


Figure 5.3. Structural model for the relationship between OCA Facebook use and the psychological well-being of cancer- affected people

Table 5.7: Structural equation analysis: regression coefficients

Description of path			Path coefficient	Significance
OCA Facebook use	--->	Social connectedness	.856	0.000
OCA Facebook use	--->	Social support	.869	0.000
OCA Facebook use	--->	Social presence	.534	0.000
OCA Facebook use	--->	Learning	.812	0.000
Learning	--->	Psychological well-being	.170	0.000
Social presence	--->	Psychological well-being	.142	0.000
Social support	--->	Psychological well-being	.413	0.004
Social connectedness	--->	Psychological well-being	.262	0.009
CIMIN:3, GFI:0.92, AGFI:0.82,CFI:0.95				

5.8 Discussion

This study used a mixed-methods research design to examine the effect of SNSs use on the psychological wellbeing of cancer-affected people. The results of interviews and a quantitative survey showed an overall positive relationship between the use of OCA Facebook and the psychological well-being of users. Findings from this study are in line with previous studies that showed the use of other dynamic health-related web-based applications (Web2.0) including blogs and forums, were associated with improved psychological well-being of breast cancer patients (Erfani & Abedin, 2014; Gustafson et al., 2005; Hong et al., 2012; Høybye et al., 2010; Klemm et al., 1998). The results are also consistent with those of studies that showed SNSs use was positively associated with the psychological well-being of students (Nabi et al., 2013; Grieve et al., 2013; Guo et al., 2014). Our study extends the literature by showing that the relationship between the use of SNS and psychological wellbeing for cancer-affected people.

This study identified factors that mediate the relationship between the use of SNS and psychological well-being of cancer-affected people. The findings of this study supported all the hypothesised relationships in the research model. The results showed that OCA Facebook use increased social support, which in turn positively influenced the psychological well-being of cancer-affected people. This study confirmed the importance of SNS use for developing social support. This finding aligns with previous studies that suggested a positive relationship between participation in Internet-based support groups and obtaining social support (Kroenke et al., 2013; Rubenstein, 2014) and ultimately improved psychological well-being of cancer patients (Høybye et al., 2010).

Findings showed a positive relationship between OCA Facebook use and social connectedness, as well as a positive and significant relationship between social connectedness and the psychological well-being of cancer-affected people. These results confirm the third and fourth hypothesis, which proposed that OCA Facebook use positively impacts social connectedness and consequently the psychological well-being of cancer-affected people. Sobel's test confirmed the role of social connectedness in mediating the impact of the use of OCA Facebook on the psychological well-being of cancer-affected people. The findings demonstrate that social connectedness can be perceived as an outcome of OCA Facebook use and a predictor of psychological well-being. The results from this study confirm belongingness theory (Baumeister & Leary, 1995) and an improvement in psychological well-being through meaningful social relationship. Findings are in line with earlier studies that showed breast cancer patients' participation in web-based health-related forums enabled them to experience a sense of belonging and greater well-being (Rodgers & Chen, 2005).

The analysis also supported the fifth and sixth hypotheses. Findings showed a positive and significant relationship between OCA Facebook use and learning as well as between learning and the psychological well-being of cancer-affected people. These findings are consistent with SCT's position that individuals' social connections play an important role in their learning (Lantolf, 1994). Findings are also inline with previous studies that showed cancer patients' learning through participating in online support groups is a predictor of psychological well-being (Gustafson et al., 1994).

Finally, positive associations between OCA Facebook use and social presence and between social presence and psychological well-being of cancer-affected people were confirmed (confirmed hypotheses 7 and 8). A mediating test showed the role of social presence in

mediating the impact of OCA Facebook use on the psychological well-being of cancer-affected people. This confirms the reciprocal relationship between experiencing social presence and psychological well-being. These findings are in line with previous studies that showed a positive association between experiencing social presence and wellbeing of cancer patients through participation in online health-related groups (Walther et al., 2005).

In summary, our qualitative study provided insights into the lived experience of cancer patients' use of Facebook and showed why it is important for cancer-affected people to use SNSs in relation to the factors influencing psychological well-being. With unprecedented convenience, availability and anonymity, Facebook could bring together cancer-affected people suffering from the same type of cancer. Cancer patients' active use (e.g. chatting, liking and creating content), as well as passive use (observing content) of OCA Facebook enabled cancer patients to have a sense of closeness with other member of OCA Facebook, enabled them to receive recommendations, advice, caring and empathy, learn new things from other members to cope with cancer related concern, make sense of information and ultimately experience positive mood and affect, feel well supported, form satisfying relationships, resist cancer-related pressures and hopeful to continue improving their health conditions. Findings from the survey showed the use of OCA Facebook enhances obtaining social support, experiences of social connectedness, development of social presence and learning and ultimately, improves psychological well-being. Our analysis showed a good fit of the proposed theoretical model for the use of OCA Facebook and the psychological well-being of cancer-affected people. This corroborates similar studies (Guo et al., 2014; Nabi et al, 2013) in which Facebook use was positively related to the psychological well-being of college students. As

Burke et al. (2010) pointed out, it is important to obtain consistent research results for different users of Facebook to make strong statements about positive outcomes of Facebook use.

5.9 Contributions

This study contributes to the literature in terms of both theory and practice. First, most previous studies used quantitative approaches to examine the relationship between SNS use and psychological well-being. Previous studies collected data from SNSs used by healthy students and attempted to explore how SNS use is related to the psychological well-being of users. In our study semi-structured interviews were conducted to gain a better understanding of how SNS use impacts the psychological well-being of people affected by cancer. In the second phase, an online survey was conducted to evaluate and empirically test the theoretical model. We triangulated the results and provided empirical support for the hypothesis that the use of OCA Facebook enhances social support, experiences of social connectedness, development of social presence and learning – and ultimately, improves psychological well-being. This study adds to the literature on SNS use and psychological well-being and provides a useful platform for future research.

Second, in this study we developed and tested a multi-theory approach to hypothesis development and to frame interpretation of relationships between the use of SNSs such as Facebook and the psychological well-being of users, specifically cancer-affected people. A lack of theoretical underpinnings in previous studies in this area had been recognised (Guo et al., 2014; Hong et al. 2011), and our study was intended to fill this gap. Our research provides new insights into the experiences of cancer patients who use Facebook. Our study showed the capacity of SNS use to improve the psychological well-being of cancer-affected people. This

evidence will assist health organisations to generate strategies and make recommendations for using Facebook for improving the psychological well-being of their users.

Third, our qualitative study provided insights into the lived experience of cancer patients' use of Facebook. This contributes to a better understanding of the ways that SNS use is associated with the psychological wellbeing of cancer-affected people. By clarifying this relationship, this study demonstrates that SNS use does indeed have possibilities for promoting psychological wellbeing of cancer-affected people. We showed the advantages that SNS use can have in the context of healthcare, at least with respect to cancer patients. The findings should encourage organisations involved in the care of cancer-affected people, and cancer patients themselves, to use Facebook to improve their psychological well-being.

5.10 Limitations and recommendations for future studies

limitation of this study and recommendation for future studies

Conducting Longitudinal investigations of users' well-being on SNSs

This study has one limitation; the population addressed in this study was examined cross-sectionally. More studies are still needed to apply a longitudinal study in order to improve the observation and understanding of SNSs use on the psychological well-being of cancer-affected people. Future research are encouraged to use a longitudinal approach, comparing cancer-affected people's psychological well-being before and after using SNSs like Facebook.

Recommendations for future studies

Conducting studies in developing countries and countries with different economic, cultural, educational and political conditions

This study involved an Australian health-related Facebook page, but some of the respondents were residents of other countries. However, no participants were residents of developing

countries. With the rapid adoption of SNSs around the world, and in particular in developing countries, research into the role of SNS use in developing-country users' psychological well-being is needed. SNS use and its consequences should be investigated with particular attention to the users' culture, education and policy backgrounds and circumstances, and results compared in different cultural contexts based on the research model proposed in this thesis.

Broadening the samples from cancer-affected people to other cohorts of SNS users

This study examined the impact of SNS use on the psychological well-being of cancer-affected people – people who have been diagnosed with cancer. During the study, we received requests to participate from many ineligible caregivers, family members and friends; this shows that the caregivers, and family of cancer-affected people are also using Facebook for information and other purposes related to cancer, as previous research suggested (Erfani et al., 2013). Future researchers are therefore encouraged to consider cancer patients' caregivers and friends as a study population and generate evidence about the impact of SNS use on their psychological well-being.

The pervasive nature of Facebook, its unique features that support extensive interactions, and its accessibility through web-enabled devices make it an ideal tool for people with mobility problems or other communication difficulties. Facebook enables its users to exchange extensive informational and emotional support through various messaging services. Users can use public messaging services for communication and making sense of data, and private messaging services for discussing sensitive issues that they might not be able to explore in a face-to-face environment. Future researchers are encouraged to investigate Facebook use by other populations, such as elderly people, people with reduced mobility, people living with

serious health conditions and chronic diseases other than cancer, and people living in remote areas, to ascertain its effects on their psychological wellbeing.

5.11 Conclusion

This study found a positive relationship between Facebook use and the psychological wellbeing of cancer-affected people. The results highlight that social support; social connectedness, social presence and learning mediate the positive impact of SNS use on the psychological wellbeing of cancer patients – the ultimate beneficiaries of the research. The extreme popularity of Facebook highlights the importance of understanding the health-related implications of its use. While some previous researchers did not detect positive consequences of Facebook use, we revealed positive benefits for users' self-perceived psychological wellbeing. Facebook-based communication practices throughout the cancer care continuum show promise. Health care providers can incorporate Facebook as an online health resource into their treatment and care of cancer-affected people. Future research should include the health industry and academics to document the outcomes of patients using SNSs – and in particular, cancer-affected people to improve psychological well-being.

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Interview questions

Why did you decide to use OCA Facebook? (Probe: needs, obtaining information, achieving emotional support, others).

How often do you use OCA Facebook?

How long in each session do you use OCA Facebook?

For how long do you use OCA Facebook?

How do you use OCA Facebook? (Probe: check news feed, chat, and post on the wall)?

How does OCA Facebook use influence you? (Probe: positive attitude toward self)?

How are do you feel or what do you experience when/after you use OCA Facebook? How would you describe the person you are then? (Probe: happy, optimistic).

What is the main reason of having the mentioned feeling?

Do you feel satisfied from using OCA Facebook? If yes, why?

Could using OCA Facebook facilitate learning healthy behaviours? If yes, how? (Probe:, by interacting with members)

Could OCA Facebook use help you to resist social/cancer related pressure? If yes, how? If no why not?

Do you think OCA Facebook could be a source that increases your happiness? Why or why not?

Is there anything else that you would like to add that could help me to understand the role of cancer related Facebook for people who have been impacted by cancer?

Survey

Investigating the impact of SNSs use on the psychological well0being of cancer-affected people

You are invited to participate in a study of the effect of Ovarian Cancer Facebook site on the psychological well-being of people who have been impacted by Ovarian Cancer. This survey is about your experience of using the Ovarian Cancer Australia Facebook.

If you feel distressed answering these questions, you are not obligated to continue. You can stop the survey at any time. You can also come back and complete the survey at another time if you choose to. Support is available from the Cancer Help Line 13 11 20 (open between 9am and 5pm, Monday to Friday) or Lifeline 13 11 14 (open 24 hours) .

A summary of the results of the data can be made available to you on request by leaving your details at the end of the survey.

Are you affected by cancer?

Are you older than 18 years old?

How old are you?

For how long are you using Ovarian Cancer Australia Facebook?

Which city are you in?

Please indicate how much you agree or disagree with each statement in the following section

SECTION 1. Please answer the following questions based on your Ovarian Cancer Australia Facebook Use.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. On average every day I use the Ovarian Cancer Australia Facebook					
2. When I am not on the Ovarian Cancer Australia Facebook, I find myself wondering what I am missing					
3. For each log session, I use Ovarian Cancer Australia Facebook for a long time					
4. On Ovarian Cancer Australia Facebook, I often post something					
5. On Ovarian Cancer Australia Facebook, I often view something					
6. On Ovarian Cancer Australia Facebook, I often reply to others					
7. I have tried to cut down on my Ovarian Cancer Australia Facebook use.					

SECTION 2. The questions in this section ask about your sense of understanding interactions and sense of sociability in Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
8. I hardly notice the other individuals on the Ovarian Cancer Australia Facebook					
9. There is a sense of sociability in the Ovarian Cancer Australia Facebook					
10. I understand others' communication on the Ovarian Cancer Australia Facebook					
11. I feel that others are aware of my presence on the Ovarian cancer Australia					
12. My interaction with other members on the Ovarian Cancer Australia Facebook is clear and understandable					

SECTION 3. The questions in this section ask about your sense of learning by using Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
13.Using the Ovarian Cancer Australia Facebook makes me feel competent in adopting healthy behaviours					
14.Using the Ovarian Cancer Australia Facebook makes me feel that I am able to do things as well as other people					
15.Using the Ovarian Cancer Australia Facebook helps me to have a positive attitude toward myself					
16.Using the Ovarian Cancer Australia Facebook makes me feel satisfied with myself					

SECTION 4. The questions in this section ask about your perceived Social Support by using Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
17.Members of the Ovarian Cancer Australia Facebook tell me what they did in a situation similar to mine					
18.Members of the Ovarian Cancer Australia Facebook offer me suggestions and advice about how to cope with cancer related problems					
19.When I feel lonely, there are several people I can talk to on the Ovarian Cancer Australia Facebook					
20.Members of the Ovarian Cancer Australia Facebook care about my cancer related concerns and worries					
21.Members of the Ovarian Cancer Australia Facebook care about my feelings and my health conditions					

SECTION 5. The questions in this section ask about sense of belonging by using Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
22.I feel close to people on the Ovarian Cancer Australia Facebook					
23.I am not understood by members of the Ovarian Cancer Australia Facebook					
24.I see people as friendly and approachable on the Ovarian Cancer Australia Facebook					
25.I am comfortable around other members on the Ovarian Cancer Australia Facebook					
26. I can communicate well with people on Ovarian Cancer Australia Facebook					

SECTION 6 .The questions in this section ask about your Psychological Wellbeing by using Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
27.I like to make improvement in my health					
28.I don't feel remote from others					
29. I lack companionship					
30. I am good at dealing with cancer related problems					
31. I can control cancer related irritations					
32. I am capable of improving my health					
33. I became optimistic about the future					

If you would like to be informed about the findings of this research please provide your email address below:

CHAPTER 6: CONCLUSION

This study was motivated by gaps in the Information Systems literature on Social Network Sites (SNSs). Many studies have affirmed the capacity of SNSs for social and organisational improvement (Huang et al., 2014; Pan et al., 2015), but little research attention has been paid to the capabilities of SNSs for health purposes. While the rapid growth in the number of users of SNSs makes it important to examine their impact on users and their potential to improve psychological well-being (Reinecke et al., 2014), most previous studies relied on healthy students as participants. Other cohorts of SNS users, in particular people living with serious health conditions, have received less attention in previous research.

6.1 Findings

This study set out to investigate how and to what extent the use of OCA Facebook impacts the psychological well-being of cancer-affected people. This study produced new understanding of the ways that SNS use is associated with the psychological well-being of cancer-affected people, and thus informs the design of future SNS-based support services. OCA Facebook was used as the exemplar in this study. Analysis of data collected in semi-structured interviews with users of OCA Facebook revealed how and in what ways SNS use impacts their psychological well-being. A theoretical model was proposed to develop a better understanding of the relationship between SNS use and psychological well-being of cancer-affected people. Analysis of data collected through a subsequent quantitative survey confirmed the theoretical model and empirically revealed the extent to which SNS use impacts the psychological well-being of cancer-affected people. Results show that OCA Facebook use is related to greater Social Support, Social Connectedness, Social Presence and learning among participants, leading to improved psychological well-being.

Paper One developed the groundwork for a general understanding of the relationship between SNSs use and the psychological well-being of users. The review showed a positive relationship exists between SNS use and users' psychological well-being. The limitations it revealed in the literature relate to the weak theoretical justifications for the relationship between SNS use and psychological well-being, and the use of students as the population in most studies that was addressed in our second and third study.

Paper Two reviewed existing research on the effect of Internet-based interventions on the psychological well-being of cancer-affected people. Finding from this study showed the use of Internet-based interventions have positive affect on the psychological well-being of cancer-affected people. Finding from this paper contributes to a better understanding of the role of Internet-based interventions for psychological well-being of cancer-affected people. The limitations it revealed in the literature relate to the weak theoretical justifications for the relationship between Internet based-intervention and psychological well-being, and the use of students as the population in most studies that was addressed in our second and third study.

This aim of paper Three was to examine how and in what ways the use of OCA Facebook page affects the psychological well-being of cancer-affected people. Qualitative semi-structured interviews were conducted with users of the OCA Facebook. Twenty-five women who were affected by ovarian cancer and were users of OCA Facebook were interviewed. A multi-theory perspective was employed to interpret the data. Results showed most interviewees used OCA Facebook daily. Some users were passive and only observed created contents; others actively posted content and communicated with other members. Analysis showed that the use of OCA Facebook enhances social support, improves the experience of social connectedness, develops social presence and learning – and ultimately, improves

psychological well-being A theoretical model was proposed in this paper to develop a better understanding of the relationship between the use of OCA's Facebook page and the psychological well-being of cancer-affected people. By clarifying this relationship, this study demonstrates that SNS use does indeed have possibilities for promoting the psychological well-being of cancer patients, arguing for the sustainability of Internet-based interventions and showing the advantages of SNS use in patient healthcare. The findings should encourage organisations involved in the care of cancer patients, and cancer patients themselves, to use Facebook to improve their psychological well-being.

Paper Four describes the work performed in testing the theoretical model defined in paper three, and answers the research question "To what extent does OCA Facebook use impact the psychological well-being of cancer-affected people?" In other words, this study aimed to empirically examine the extent to which SNS use impacts the psychological well-being of cancer-affected people. The survey was advertised on OCA Facebook, and 154 responses from cancer-affected members were collected and analysed. Participants were self-selected. Factor analysis was used for testing questions loading on corresponding constructs and also for reliability and validity checks, and structural equation modelling was applied to estimate the relationship between constructs. The results showed that cancer-affected people's use of OCA Facebook page positively influences their psychological well-being. Paper four showed that social support, learning, social connectedness and social presence mediate the relationship between Facebook use and the psychological well-being of cancer-affected people, demonstrating the potential value of SNSs within support services in the health care industry.

6.2. Contributions and implications

The entire study, meaning the four papers collectively, contributes to the literature in terms of both theory and practice.

Contribution to theory

1. The confirmed fit of the theoretical model for the use of SNS for psychological well-being validates the theoretical contribution of the research.

Viewed through the lenses of Belongingness Theory, Sociocultural Theory, Social Support Theory and Social Presence Theory, this study showed the positive impact of SNS use on the psychological well-being of cancer-affected people. By clarifying this relationship, this study contributes to Information Systems research on SNSs in two ways. First, it demonstrates conclusively that SNS use can promote psychological well-being, arguing for the sustainability of Internet-based interventions and showing the advantages that SNS use can have in the context of healthcare, at least with respect to cancer-affected people. Second, by developing a theoretical model, the research further illustrated mechanism through which SNS use enhances the psychological well-being of cancer-affected people. The model that predicts Facebook use enhances reception of social support, experiences of connectedness, development of effective communication and learning – and ultimately, enhanced psychological well-being. The theoretical model improves understanding of the factors that mediate the positive impact of Facebook use on the psychological well-being of cancer-affected people.

2. This study adds to the literature on SNS use and psychological well-being and provides a useful platform for future research. In particular, it addresses important gaps in the existing literature through an under-used methodological approach.

Most previous studies in this field have affirmed the capacity of SNSs for social and organisational improvement (Huang et al., 2014; Pan et al., 2015). Accordingly, this study addressed the gap in the Information Systems literature on SNSs by investigating the impact of SNS use for health purposes. While some studies have examined the impact of SNS use on psychological well-being (Manago & Greenfield, 2012; Apaolaza et al., 2013; Nabi et al., 2013; Liu & Yu, 2013; Oh et al., 2013; Guo & Ito, 2014), they focused on healthy students; people living with serious health conditions have been neglected in previous research. Previous studies collected data from SNSs used by healthy students and attempted to explore how SNS use is related to the psychological well-being of users. In our study semi-structured interviews were conducted to gain a better understanding of how SNS use impacts the psychological well-being of people affected by cancer. In the second phase, an online survey was conducted to evaluate and empirically test the theoretical model. We triangulated the results and provided empirical support for the hypothesis that the use of OCA Facebook enhances social support, experiences of social connectedness, development of social presence and learning – and ultimately, improves psychological well-being. A series of Sobel tests was carried out to assess the significance of indirect effects between the variables in the model. The study responded to the limitations revealed in the literature (Papers One and Two) related to the weak theoretical justification for the relationship between Internet-based interventions and the psychological well-being of cancer-affected people, and specifically between SNS use and psychological well-being.

3. This study applied Belongingness Theory, Sociocultural Theory, Social Support Theory and Social Presence Theory to understand and explain the impact of Facebook use on the psychological well-being of cancer-affected people. Specifically, previous studies on

Facebook have not used the perspective of sociocultural theory to explain the relationship between Facebook use and psychological well-being. This study represents the first extension of sociocultural theory beyond the learning and teaching area to the Information systems area, e-health, and will encourage future researchers to consider sociocultural theory as an important theoretical underpinning when studying the impact of SNSs on the psychological well-being of users.

Implications for practice

1. The research provides a framework for practitioners in the health sector responsible for the design of Facebook and other SNSs.

Through providing insights into the lived experiences of the users of Facebook, and proposing and validating a model of SNS use and psychological well-being, this study enables practitioners to better understand the positive implications of SNS use for cancer-affected people. It will motivate healthcare stakeholders such as government, healthcare organisations, patients, their caregivers, their family and friends to use Facebook for the purpose of improving psychological well-being. SNSs have already been influential in many fields, and this study showed SNSs are beginning to have an impact in healthcare. This study showed the capacity of SNS to improve psychological well-being, demonstrating their potential for opening up new opportunities for the healthcare industry and promising approaches for shaping the future of healthcare.

2. This study shows that there is a significant gap in our understanding of how people affected by cancer use Facebook for obtaining information and support.

This study showed Facebook is attracting more and more individuals due to its specific characteristics that support effective and extensive communication and easy access. The latter

is likely to contribute to an increase in the effectiveness of modern healthcare. The study highlights the benefits of Facebook use for cancer-affected people, including enabling them to easily exchange information about cancer, make sense of information provided by their doctors, find out about available tests and cancer care, share experiences and gain support, and learn new things from others going through a similar experience. Facebook use enabled cancer-affected people to continue their personal growth, motivated them to continue learning new things, and enabled them to establish satisfying social relationships and to resist negative social pressures. The findings should encourage organisations involved in the care of cancer patients, and cancer patients themselves, to use Facebook to improve their psychological well-being.

Implications for researchers

1. The proposed theoretical model is an excellent starting point for researchers who are interested in the factors that affect the psychological well-being of cancer-affected people through SNS use. There are important limitations in the literature.

This study showed that Facebook has the capacity to maximise interaction, facilitate informational and emotional exchange among people with poor health conditions, and develop communication. Studies in e-health field have highlighted that an effective e-health application should have the characteristics to maximize interaction, features to deliver understandable message and work effectively across different communication platforms to promote health outcome (Neuhauser & Kreps, 2008). Other researchers have recommended the development of better evidence on the ability of Internet applications to promote health outcomes among vulnerable populations (Kreps & Neuhauser, 2010). Therefore, this study suggests that future research should examine the role of Facebook as an e-health application.

2. Papers One and Two showed there is a lack of research on internet-based interventions, and SNS use specifically, for psychological well-being in developing countries. With the rapid adoption of SNSs around the world, and in particular in developing countries, research into the role of SNS use for users' psychological well-being in these countries is needed. In addition, countries with very different cultural, educational, and political conditions are increasingly using SNSs. However, none of the studies reviewed in Papers One and Two focused on underserved societies. Studies of the implications of SNS use for psychological well-being, with particular attention to the users' culture, education and policy backgrounds and circumstances, would be a valuable addition to the literature.

This dissertation has provided a theoretical framework for understanding the use of SNS on the psychological well-being of cancer –affected people. Further research is warranted to assess the efficacy and effectiveness of these theories in predicting and explaining the use of Social Network Sites among other illness groups.

6.3 Limitations, recommendations for future studies and conclusion

limitation of this study and recommendation for future studies

Conducting Longitudinal investigations of users' well-being on SNSs

This study has one limitation; the population addressed in this study was examined cross-sectionally. More studies are still needed to apply a longitudinal study in order to improve the observation and understanding of SNSs use on the psychological well-being of cancer-affected people. Future research are encouraged to use a longitudinal approach, comparing cancer patients' psychological well-being before and after using SNSs like Facebook.

Recommendations for future studies

Assessing the impact of different SNSs on the psychological well-being

This study focused on Facebook. However, Facebook is currently the most popular SNS worldwide. The finding of this paper is generalizable to the other SNSs with similar characteristics to Facebook. Future studies could examine the use of other public or private SNSs and content-oriented sites on users' psychological well-being

Conducting studies in developing countries and countries with different economic, cultural, educational and political conditions

This study involved an Australian health-related Facebook page, but some of the respondents were residents of other countries. However, no participants were residents of developing countries. With the rapid adoption of SNSs around the world, and in particular in developing countries, research into the role of SNS use in developing-country users' psychological well-being is needed. SNS use and its consequences should be investigated with particular attention to the users' culture, education and policy backgrounds and circumstances, and results compared in different cultural contexts based on the research model proposed in this thesis.

Broadening the samples from cancer-affected people to other cohorts of SNS users

This study examined the impact of SNS use on the psychological well-being of cancer-affected people – people who have been diagnosed with cancer. During the study, we received requests to participate from many ineligible caregivers, family members and friends; this shows that the caregivers, and family of cancer-affected people are also using Facebook for information and other purposes related to cancer, as previous research suggested (Erfani et al., 2013). Future researchers are therefore encouraged to consider cancer patients' caregivers and friends

as a study population and generate evidence about the impact of SNS use on their psychological well-being.

The pervasive nature of Facebook, its unique features that support extensive interactions, and its accessibility through web-enabled devices make it an ideal tool for people with mobility problems or other communication difficulties. Facebook enables its users to exchange extensive informational and emotional support through various messaging services. Users can use public messaging services for communication and making sense of data, and private messaging services for discussing sensitive issues that they might not be able to explore in a face-to-face environment. Future researchers are encouraged to investigate Facebook use by other populations, such as elderly people, people with reduced mobility, people living with serious health conditions and chronic diseases other than cancer, and people living in remote areas, to ascertain its effects on their psychological wellbeing.

Assessing the impact of SNS use on psychological distress

This study investigated the impact of SNS use on psychological well-being, defined in the literature in terms of autonomy, personal growth, self-acceptance, life purpose, environmental mastery and positive relatedness; psychological well-being has also been conceptualised as feeling happy, capable, well supported and satisfied with life. The qualitative phase revealed suggestions that SNS use can play a role in decreasing stress and depression, which are strong indicators of psychological distress (Winefield et al., 2012). Analysis of psychological distress was outside the scope of our study; however, it is recommended that future studies investigate the impact of SNS use on the psychological distress of cancer-affected people.

To conclude, the results presented in this thesis highlight that social support, social connectedness, social presence and learning mediate the positive impact of SNS use on the psychological well-being of cancer-affected people – the ultimate beneficiaries of the research.

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Appendix I Interview Questions

The purpose of this interview is to learn about your personal thoughts, opinions and experiences regarding the use of Social Network Sites (Ovarian Cancer Australia Facebook), as a source of support for anyone who has been affected by ovarian cancer and to explore in how and in what ways SNSs use is related to the psychological well-being of people who have been affected by ovarian cancer.

Interview questions

Why did you decide to use OCA Facebook? (Probe: needs, obtaining information, achieving emotional support, others).

How often do you use OCA Facebook?

How long in each session do you use OCA Facebook?

For how long do you use OCA Facebook?

How do you use OCA Facebook? (Probe: check news feed, chat, and post on the wall)?

How does OCA Facebook use influence you? (Probe: positive attitude toward self)?

How do you feel or what do you experience when/after you use OCA Facebook? How would you describe the person you are then? (Probe: happy, optimistic).

What is the main reason of having the mentioned feeling?

Do you feel satisfied from using OCA Facebook? If yes, why?

Could using OCA Facebook facilitate learning healthy behaviours? If yes, how? (Probe:, by interacting with members)

Could OCA Facebook use help you to resist social/cancer related pressure? If yes, how? If no why not?

Do you think OCA Facebook could be a source that increases your happiness? Why or why not?

Is there anything else that you would like to add that could help me to understand the role of cancer related Facebook for people who have been impacted by cancer?

Appendix II Participant Information and Consent Form and Survey

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Information statement

Name of Project: Investigating the impact of Social Network Sites use on the psychological well-being of cancer-affected people

You are invited to participate in the study of how the Ovarian Cancer Facebook site is contributing to the psychological well-being of cancer-affected people.

What is the purpose of this research?

Users of Social Network Sites (SNSs) such as Facebook use them to find information, connect with others that have had similar experiences and to contribute to the discussion around a particular topic. The aim of this study is to develop an understanding of the potential ways in which the use of the Ovarian Cancer Facebook impacts on psychological well-being of cancer-affected people. This study is being conducted by Ms Seyedezahra Shadi Erfani to meet the requirements of Doctor of Philosophy at Macquarie University under the supervision of Dr. Yvette Blount (contact number: 02 9850 8514, email yvette.blount@mq.edu.au) of the Department of Accounting and Corporate Governance.

Who can participate in this research?

Users of the Ovarian Cancer Australia Facebook who meet the following criteria: have been diagnosed with cancer, have used the Facebook site over a period of two months or more and are over 18 years of age.

Potential Benefits of this study.

The findings from this study will be important for ascertaining how Social Network Sites may be able to enhance cancer- affected people's psychological well-being. The insights and findings will be of benefit for health care organizations developing and using social network sites so that they provide optimum support and information services for cancer patients to enhance psychological well-being.

Potential risk and strategy for dealing with any potential risk

If you experience distress or feel uncomfortable with the questions, you can stop the survey at any time. At any time you can return and complete the survey. If the survey is not completed, we will not use your results. Support is available from the Cancer Help Line 13 11 20 (open between 9am and 5pm, Monday to Friday) or Lifeline 13 11 14 (open 24 hours).

Any information or personal details gathered in the course of the study are confidential, except as required by law. No individual will be identified in any publication of the results. A summary of the results of the data can be made available to you on request by contacting Dr Yvette Blount (yvette.blount@mq.edu.au).

How can I participate in this research?

If you decide to participate, it should take about 30 minutes to complete the survey. A summary of the results of this study will be made available on the Ovarian Cancer Australia Facebook website in late 2015. If you have any questions about this study or if you have

difficulties with the survey, Shadi will be happy to help and can be reached by telephone at: 0424253118 or by email at shadi.erfani@mq.edu.au.

Who should I contact if I have concerns about the conduct of this research?

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee (Medical Sciences). If you have any complaints or reservations about any ethical aspects of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

- You have read the above information.
- You voluntarily agree to participate.
- You are at least 18 years of age.
- You have been a member of the Ovarian Cancer Facebook page for minimum of two months.

Start Survey

Investigation the impact of social Network Sites on the psychological well-being of cancer affected people.

Survey

Investigating the impact of SNSs use on the psychological well-being of cancer-affected people

You are invited to participate in a study of the effect of Ovarian Cancer Facebook site on the psychological well-being of people who have been impacted by Ovarian Cancer. This survey is about your experience of using the Ovarian Cancer Australia Facebook.

If you feel distressed answering these questions, you are not obligated to continue. You can stop the survey at any time. You can also come back and complete the survey at another time if you choose to. Support is available from the Cancer Help Line 13 11 20 (open between 9am and 5pm, Monday to Friday) or Lifeline 13 11 14 (open 24 hours) .

A summary of the results of the data can be made available to you on request by leaving your details at the end of the survey.

Are you affected by cancer?

Are you older than 18 years old?

How old are you?

For how long are you using Ovarian Cancer Australia Facebook?

Which city are you in?

Would you please indicate how much you agree or disagree with each statements in the following section

SECTION 1. Please answer the following questions based on your Ovarian Cancer Australia Facebook Use.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. On average every day I use the Ovarian Cancer Australia Facebook					
2. When I am not on the Ovarian Cancer Australia Facebook, I find myself wondering what I am missing					
3. For each log session, I use Ovarian Cancer Australia Facebook for a long time					
4. On Ovarian Cancer Australia Facebook, I often post something					

5. On Ovarian Cancer Australia Facebook, I often view something					
6. On Ovarian Cancer Australia Facebook, I often reply to others					
7. I have tried to cut down on my Ovarian Cancer Australia Facebook use.					

SECTION 2. The questions in this section ask about your sense of understanding interactions and sense of sociability in Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
8. I hardly notice the other individuals on the Ovarian Cancer Australia Facebook					
9. There is a sense of sociability in the Ovarian Cancer Australia Facebook					
10. I understand others' communication on the Ovarian Cancer Australia Facebook					
11. I feel others are aware of my presence on the Ovarian cancer Australia					
12. My interaction with other members on the Ovarian Cancer Australia Facebook is clear and understandable					

SECTION 3. The questions in this section ask about your sense of learning by using Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
13. Using the Ovarian Cancer Australia Facebook makes me feel competent in adopting healthy behaviours					
14. Using the Ovarian Cancer Australia Facebook makes me feel that I am able to do things as well as other people					
15. Using the Ovarian Cancer Australia Facebook helps me to have a positive attitude toward myself					
16. Using the Ovarian Cancer Australia Facebook makes me feel satisfied with myself					

SECTION 4. The questions in this section ask about your perceived Social Support by using Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
17.Members of the Ovarian Cancer Australia Facebook tell me what they did in a situation similar to mine					
18.Members of the Ovarian Cancer Australia Facebook offer me suggestions and advice about how to cope with cancer related problems					
19.When I feel lonely, there are several people I can talk to on the Ovarian Cancer Australia Facebook					
20.Members of the Ovarian Cancer Australia Facebook care about my cancer related concerns and worries					
21.Members of the Ovarian Cancer Australia Facebook care about my feelings and my health conditions					

SECTION 5. The questions in this section ask about sense of belonging by using Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
22.I feel close to people on the Ovarian Cancer Australia Facebook					
23.I am not understood by members of the Ovarian Cancer Australia Facebook					
24.I see people as friendly and approachable on the Ovarian Cancer Australia Facebook					
25.I am comfortable around other members on the Ovarian Cancer Australia Facebook					
26. I can communicate well with people on Ovarian Cancer Australia Facebook					

SECTION 6 .The questions in this section ask about your Psychological Wellbeing by using Ovarian Cancer Australia Facebook.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
27.I like to make improvement in my health					
28.I don't feel remote from others					
29. I lack companionship					
30. I am good at dealing with cancer related problems					
31. I can control cancer related irritations					
32. I am capable of improving my health					
33. I became optimistic about the future					

If you would like to be informed about the findings of this research please provide your email address below:

.....@.....

Thank you for your time and participation!

Appendix III Ethics approval

Dear Dr Blount

RE: *Investigating the impacts of social network sites use on cancer survivor's psychological well being*

Thank you for your emails dated 28 October and 10 November 2013 responding to the issues raised by the Macquarie University Human Research Ethics Committee (HREC (Medical Sciences)).

The HREC (Medical Sciences) is fully constituted and operates in accordance with the National Health and Medical Research Council's National Statement on Ethical Conduct in Human Research (2007) (the National Statement) and the CPMP/ICH Note for Guidance on Good Clinical Practice.

Details of this approval are as follows:

Reference No: 5201300409

Approval Date: 12 November 2013

This letter constitutes ethical and scientific approval only.

Before commencing research at this site, please contact the Research Governance Manager on 9850 4446.

The following documentation has been reviewed and approved by the HREC (Medical Sciences):

Documents reviewed	Version no.	Date
Macquarie University HREC Application Form	2.1	Received Oct 2013
Correspondence from Dr Yvette Blount addressing the HREC's feedback		Received 28/10/2013 & 10/11/2013
MQ Participant Information and Consent Form (PICF) – Interview	3	23/10/2013
MQ Participant Information and Consent Form (PICF) – Survey	3	23/10/2013
Participant recruitment interview		undated

Interview guide		undated 15/11/2013
Telephone recruitment script for interview study		undated
Survey	4	9/11/2013

Standard Conditions of Approval:

1. Continuing compliance with the requirements of the *National Statement*, which is available at the following website:

<http://www.nhmrc.gov.au/book/national-statement-ethical-conduct-human-research>

2. Approval is for five (5) years, subject to the submission of annual reports.

Yours sincerely



Dr Karolyn White

Director, Research Ethics

Chair, Human Research Ethics Committee (Medical Sciences)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2007) (the National Statement) and the CPMP/ICH Note for Guidance on Good Clinical Practice.

Appendix IV: Study advertisement

Department of Accounting and Corporate Governance

Faculty of Business and Economics

Macquarie University, NSW, 2109

Fax: +61 (2) 9850-8497

Email: shadi.erfani@ mq.edu.au

Chief Investigator's / Supervisor's Name:

Yvette Blount

“You are invited to participate in a study of how Ovarian Cancer Australia's Facebook page affects the psychological well-being of people who have been impacted by ovarian cancer.

This study is being conducted by Ms Shadi Erfani as part of her Doctor of Philosophy at Macquarie University under the supervision of Dr. Yvette Blount (contact number: 02 9850 8514, email yvette.blount@mq.edu.au) of the Department of Accounting and Corporate Governance.

The study is open to anyone who has used the Ovarian Cancer Australia Facebook page for a minimum of two months and has been diagnosed by ovarian cancer at any time. Participants must be 18 years of age or older.

Participation involves being interviewed about your experience of using the Ovarian Cancer Australia Facebook page. Interviews will be conducted either face to face in a controlled environment that support be available such as Ovarian Cancer Australia office, via phone or Skype, depending on your preference. As a token of appreciation, participants will receive a \$50 Westfield gift voucher.

If you have any questions about the study or are interested in participating, please contact Ms.Shadi Erfani at shadi.erfani@mq.edu.au or on 0424253118.

Appendix V: Telephone recruitment script for interview study

Hello. May I speak to: [Name]

This is Shadi Erfani from the Macquarie University.

I am the PhD student who is conducting a research study how Ovarian Cancer Australia's Facebook page affects the psychological well-being of people who have been impacted by ovarian cancer. Let me begin by thank you again for participating in our research study.

I am calling you now because you indicated that you would be willing to participate in study interview. The purpose of this interview is to learn about your personal thoughts, opinions and experiences and achieved benefits regarding Social Network Sites use (Ovarian Cancer Australia Facebook) as a source of online support for people affected by ovarian cancer, and to investigate in what ways SNSs use may impact cancer –affected psychological well-being.

This interview can be conducted over the phone, Skype or face-to –face, at a time that is convenient for you and will take approximately 45 minutes

It is completely voluntary and confidential. You may choose not to participate, not to answer certain questions or stop the interview at any time. Your responses will be treated confidentially.

Q1. Are you still interested in participating in interview?

☐ Yes

☐ No

Thank you for your time and consideration.

I will send you a study package that will include a formal consent form. I would ask you to please read and sign the consent form and return it to me. Once you have returned the signed consent form, we can conduct the interview.

What address should I use to send you the consent form? I can send it to you by email and you can fax it back to me. Or I can send it to you by postal mail with a return postage-paid envelope.

Which method would you prefer? CONFIRM.

Let's set up a tentative date and time within the next two weeks to conduct the interview. When would be a convenient time for you?

Great. I will call/meet you at the agreed upon date and time.

Thank you for your interest in this study

Appendix VI: Consent Form for Interviews

Dr Yvette Blount

Macquarie University NSW 2109

Participant Information and Consent Form

Name of Project: Investigating the impact of social Network Sites on the psychological well-being of cancer affected people

You are invited to participate in the study of how the Ovarian Cancer Facebook site is contributing to the psychological well-being of a woman who has been diagnosed with ovarian cancer.

What is the purpose of this research?

Users of Social Network Sites (SNSs) such as Facebook use them to find information, connect with others that have had similar experiences and to contribute to the discussion around a particular topic. The aim of this study is to develop an understanding of the potential ways in which the use of the Ovarian Cancer Facebook impacts on psychological well-being of a woman who has been diagnosed with ovarian cancer. This study is being conducted by Ms Seyedezahra Shadi Erfani to meet the requirements of Doctor of Philosophy at Macquarie University under the supervision of Dr. Yvette Blount (contact number: 02 9850 8514, email yvette.blount@mq.edu.au) of the Department of Accounting and Corporate Governance.

Who can participate in this research?

Users of the Ovarian Cancer Australia Facebook who meet the following criteria: have been diagnosed with cancer, have used the Facebook site over a period of two months or more and are over 18 years of age.

Procedure:

If you decide to participate, two researchers (Dr. Yvette Blount or Dr Babak Abedin and Ms Seyedezahra Shadi Erfani) will interview you about your experience of using the Ovarian Cancer Australia Facebook site. The interview is expected to take one hour. With your permission, we would like to record these interviews.

Participation is voluntary. It is important to note that you can choose not to answer questions. You may also stop the interview at any time. Any information or personal details gathered in the course of the study are confidential, except as required by law. No individual will be identified in any publication of the results. A summary of the results of the data can be made available to you on request by contacting Dr Yvette Blount (yvette.blount@mq.edu.au).

Potential Benefits of this study.

The findings from this study will be important for ascertaining how social network sites may be able to enhance cancer-affected psychological well-being. The insights and findings will be of benefit for health care organisations developing and using social network sites so that they provide optimum support and information services for cancer patients to enhance psychological well-being.

Potential risk and strategy for dealing with any potential risk

You can choose whether you would like the interview to take place face-to-face, on Skype or via phone. Face-to-Face Interviews will be conducted either face to face in a controlled environment that support be available. You may choose to have a caregiver or other support person with you during the interview. If you experience distress or feel uncomfortable with the

questions, the researchers will immediately stop the interview in order to have a break and/or offer support (if you wish we could make an appointment with a counsellor at no cost to you).

Interviews conducted on Skype or via phone may be stopped at any time. Support is available from the Cancer Help Line 13 11 20 (open between 9am and 5pm, Monday to Friday) or Lifeline 13 11 14 (open 24 hours).

What participants can expect after taking part?

As a token of our appreciation for taking part in the interview, we would like to offer you a \$50 Westfield gift voucher. The results of the study will be made available to the Ovarian Cancer Community.

Whom should I contact if I have concerns about the conduct of this research?

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee (Medical Sciences). If you have any complaints or reservations about any ethical aspects of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Agreement:

I, *(participant's name)* have read and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant's Name: _____

(Block letters)

Participant's Signature: _____ Date: _____

Investigator's Name: _____

(Block letters)

Investigator's Signature: _____ Date: _____

* If you would like to be informed about the results, you can include your email address below:

Email: _____

THANK YOU!

Appendix IV: First follow up

Department of Accounting and Corporate Governance

Faculty of Business and Economics

Macquarie University, NSW, 2109

Fax: +61 (2) 9850-8497

Email: shadi.erfani@ mq.edu.au

Chief Investigator's / Supervisor's Name:

Yvette Blount

“You are invited to participate in a study of how Ovarian Cancer Australia's Facebook page affects the psychological well-being of people who have been impacted by ovarian cancer.

This study is being conducted by Ms Shadi Erfani as part of her Doctor of Philosophy at Macquarie University under the supervision of Dr. Yvette Blount (contact number: 02 9850 8514, email yvette.blount@mq.edu.au) of the Department of Accounting and Corporate Governance.

The study is open to anyone who has used the Ovarian Cancer Australia Facebook page for a minimum of two months and has been diagnosed by ovarian cancer at any time. Participants must be 18 years of age or older.

What is the purpose of this research?

Users of Social Network Sites (SNSs) such as Facebook use them to find information, connect with others that have had similar experiences and to contribute to the discussion around a particular topic. The aim of this study is to develop an understanding of the potential ways in which the use of the Ovarian Cancer Facebook Website impacts on psychological well-being

of a woman who has been diagnosed with ovarian cancer. This study is being conducted by Ms Seyedezahra Shadi Erfani to meet the requirements of Doctor of Philosophy at Macquarie University under the supervision of Dr. Yvette Blount (contact number: 02 9850 8514, email yvette.blount@mq.edu.au) of the Department of Accounting and Corporate Governance.

Who can participate in this research?

Users of the Ovarian Cancer Australia Facebook who meet the following criteria: have been diagnosed with cancer, have used the Facebook site over a period of two months or more and are over 18 years of age.

Potential Benefits of this study.

The findings from this study will be important for ascertaining how social network sites may be able to enhance cancer-affected psychological well-being. The insights and findings will be of benefit for health care organisations developing and using social network sites so that they provide optimum support and information services for cancer- affected people to enhance psychological well-being.

If you have any questions about the study or are interested in participating, please contact Ms.Shadi Erfani at shadi.erfani@mq.edu.au or on 0424253118.

Appendix VII: Thank You Card for Participation



Dear ...

Thank you for participating in interview for our research study investigating the impacts of Social Networks Sites use on psychological well-being of people who have been impacted by ovarian cancer.

Your responses are important to us.

Sincerely,

Shadi Erfani

PhD Candidate

Faculty of Business and Economics

Email:shadi.erfani@mq.edu.au