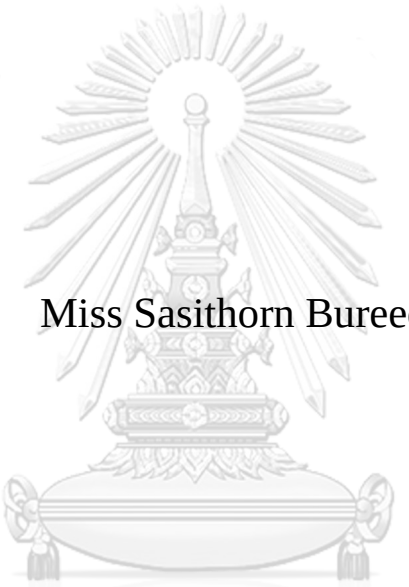
Online social media and applications use engaing in sexual risk behaviors among HIV infected Men Who have sex with men in Bangkok, Thailand

Miss Sasithorn Bureechai



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การใช้สื่อออนไลน์และแอปพลิเคชั่นในการมีพฤติกรรมเสี่ยงทางเพศของกลุ่มผู้ติดเชื้อไวรัสเอชไอวีชายรักชายในกรุงเทพมหานคร ประเทศไทย

น.ส.ศศิธร บุรีชัย

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
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Thesis Title	Online social media and applications use engaing in sex ual risk behaviors among HIV infected Men Who have s ex with men in Bangkok, Thailand
By	Miss Sasithorn Bureechai
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ศศิธร บุรีชัย : การใช้สื่อออนไลน์และแอปพลิเคชั่นในการมีพฤติกรรมเสี่ยงทางเพศของกลุ่มผู้ติดเชื้อไวรัสเอชไอวีชายรักชายในกรุงเทพมหานคร ประเทศไทย. (Online social media and applications use engaing in sexual risk behaviors among HIV infected Men Who have s ex with men in Bangkok, Thailand) อ.ที่ปรึกษาหลัก : รศ. ดร.จิตรลดา อารีย์สันติชัย

การศึกษาวิจัยแบบภาคตัดขวางนี้เป็นการศึกษาแบบแผนการใช้งานสื่อสังคมออนไลน์ และพฤติกรรมเสี่ยงทางเพศของกลุ่มชายรักชายในกรุงเทพมหานคร ประเทศไทย โดยการสัมภาษณ์ตัวต่อตัวในกรณีที่อาสาสมัครยินดีให้ผู้วิจัยสัมภาษณ์และสำหรับอาสาสมัครที่ไม่ยินดีให้สัมภาษณ์แต่ยินดีร่วมโครงการวิจัยจะเป็นการเก็บข้อมูลโดยใช้แบบสอบถามโดยตอบด้วยตนเอง ซึ่งเป็นงานวิจัยทั้งเชิงปริมาณและเชิงคุณภาพในกลุ่มชายรักชายในกรุงเทพมหานคร อาสาสมัครของโครงการวิจัยทั้งหมดมาจากผู้ที่มารับบริการด้านสุขภาพที่ศูนย์วิจัยแห่งหนึ่งและคลินิคให้บริการด้านสุขภาพแห่งหนึ่ง รวมถึงผู้สนใจเข้าร่วมตอบแบบสอบถามทางออนไลน์ที่อาศัยอยู่ในเขตกรุงเทพมหานคร จำนวนทั้งหมด 201 คน

ผลการศึกษาพบว่า ในจำนวนอาสาสมัครชายรักชายทั้งหมด 201 คน โดยอาสาสมัครที่ติดเชื้อเอชไอวีจำนวน 71 คน(ร้อยละ 35.3) และ อาสาสมัครที่ไม่มีเชื้อเอชไอวีจำนวน 130 คน(ร้อยละ 64.7) จากจำนวนอาสาสมัครทั้งสองกลุ่มนี้ คิดเป็นร้อยละ 80.3 ของกลุ่มที่ติดเชื้อ และ ร้อยละ56.2 ของกลุ่มที่ไม่ติดเชื้อมีการใช้งานสื่อสังคมออนไลน์ในการหาคู่นอน อายุของอาสาสมัครมีผลกับวิธีการหาคู่นอน อายุเฉลี่ยของกลุ่มอาสาสมัครที่ติดเชื้อ(Mean age) 34.78±11.78 และกลุ่มที่ไม่ติดเชื้อ (Mean age) 25.56 ±6.38 อาสาสมัครที่มีอายุในช่วง15-34 ปี เลือกใช้งานช่องทางที่เป็นสื่อสังคมออนไลน์มากกว่ากลุ่มคนที่มีอายุ34 ปีขึ้นไป คิด นอกจากนี้ยังพบว่า สถานะการติดเชื้อเอชไอวีมีผลให้มีการใช้สื่อสังคมออนไลน์เพื่อการหาคู่นอน โดยเห็นได้ว่า อัตราส่วนการมีคู่นอนที่ได้จากช่องทางออนไลน์ของกลุ่มติดเชื้อน้อยกว่ากลุ่มที่ไม่ติดเชื้อ ทั้งนี้ยังพบว่าในกลุ่มอาสาสมัครที่ไม่ติดเชื้อมีจำนวนคู่นอนที่มาจากการใช้งานสื่อสังคมออนไลน์มากกว่ากลุ่มอาสาสมัครที่ติดเชื้ออย่างเห็นได้ชัด ทั้งนี้ข้อมูลจำนวนคู่นอนและประเภทคู่นอนที่ได้จากช่องทางการใช้สื่อสังคมออนไลน์ของงานวิจัยนี้ยังพบว่า เมื่อเปรียบเทียบร้อยละการได้คู่นอนระหว่างสองกลุ่มมีความแตกต่างกันคือ กลุ่มที่ติดเชื้อมีการใช้งานสื่อสังคมออนไลน์ในการหาคู่ที่จริงแต่ได้คู่นอนในอัตราที่น้อยกว่ากลุ่มที่ไม่ติดเชื้อเมื่อคิดจากจำนวนผู้ใช้งานภายในกลุ่มเดียวกัน และยังพบอีกว่ากลุ่มผู้ติดเชื้อไม่มีการรายงานว่าได้คู่นอนประเภทsex workerจากการใช้งานสื่อสังคมออนไลน์ภายในช่วงระยะเวลาหนึ่งปีที่ผ่านมา ในขณะที่กลุ่มไม่ติดเชื้อมีคู่นอนที่เป็นประเภท sex workerจากการใช้งานสื่อสังคมออนไลน์

ด้านพฤติกรรมเสี่ยงทางเพศกับคู่นอนที่ได้จากช่องทางสื่อสังคมออนไลน์นั้น จากการศึกษาพบว่าทั้งสองกลุ่มยังมีความเสี่ยงทั้งในการการแพร่เชื้อและรับเชื้อโรคที่สามารถติดต่อทางเพศสัมพันธ์ได้ โดยพบว่า จากจำนวนผู้ใช้งานของทั้งสองกลุ่ม โดยประมาณร้อยละ 70 ของกลุ่มที่ติดเชื้อและ ของกลุ่มที่ไม่ติดเชื้อมีการใช้ถุงยางอนามัยกับทุกคนในขณะที่ร้อยละ20ของกลุ่มอาสาสมัครทั้งสองกลุ่มมีการใช้ถุงยางอนามัยกับคู่นอนที่ได้จากช่องทางสื่อสังคมออนไลน์เป็นบางครั้งเท่านั้น ในเรื่องการดื่มเครื่องดื่มที่มีแอลกอฮอล์ก่อนการมีเพศสัมพันธ์นั้นพบว่า ร้อยละ 92.2ส่วนใหญ่ของกลุ่มที่ติดเชื้อไม่มีการดื่มเครื่องดื่มที่มีแอลกอออล์ก่อนการมีเพศสัมพันธ์ ในขณะที่ ร้อยละ 52.1 ของกลุ่มไม่ติดเชื้อมีการดื่มเครื่องดื่มที่มีแอลกอฮอล์บางครั้งก่อนการมีเพศสัมพันธ์ มีเพียงส่วนน้อยเท่านั้นที่ต้องดื่มเครื่องดื่มที่มีแอลกอฮอล์ก่อนการมีเพศสัมพันธ์ทุกครั้ง การศึกษาการใช้สารเสพติดก่อนการมีเพศสัมพันธ์กับคู่นอนที่พบจากสื่อสังคมออนไลน์ พบว่า ร้อยละ90 ของกลุ่มที่ติดเชื้อไม่มีการใช้สารเสพติดก่อนการมีเพศสัมพันธ์กับคู่นอนที่ได้จากช่องทางสื่อสังคมออนไลน์ ในขณะที่อาสาสมัครจำนวนหนึ่งของกลุ่มที่ไม่ติดเชื้อคิดเป็นร้อยละ 28.4 มีการใช้สารเสพติดบางครั้งก่อนการมีเพศสัมพันธ์กับคู่นอนที่รู้จักผ่านช่องทางสื่อสังคมออนไลน์

รูปแบบในการใช้สื่อสังคมออนไลน์ของกลุ่มชายรักชายเพื่อจุดประสงค์การหาคู่นอนในงานวิจัยชิ้นนี้ได้ทำการศึกษาในด้าน การสร้างโปรไฟล์ การโพสต์รูปภาพ การพูดคุยสนทนา และการใช้ฟังก์ชั่นวิดีโอคอล หรือ การโพสต์วิดีโอ ที่มีให้ใช้งานจำเพาะในแต่ละแอปพลิเคชั่นนั้นพบทั้งการใช้งานที่เหมือนและต่างกันในอาสาสมัครสองกลุ่ม โดยพบว่าการสร้างโปรไฟล์ของอาสาสมัครที่ติดเชื้อส่วนใหญ่จะมีการระบุเพียงอายุ น้ำหนัก และส่วนสูง ซึ่งมีผลต่อการได้คู่นอนอย่างมีนัยสำคัญทางสถิติ ($p<0.05$) และ การที่ไม่มีการระบุข้อมูลที่ยืนยันตัวตนได้จริงในครั้งแรกที่มีการใช้งานในกลุ่มที่ติดเชื้อมีผลต่อการได้คู่นอนจากช่องทางออนไลน์ที่มีผลทางสถิติอีกด้วย ($p<0.05$) ในขณะที่กลุ่มที่ไม่ติดเชื้อมีความหลากหลายในการสร้างโปรไฟล์ในครั้งแรก โดยที่อาจจำไม่ได้คำนึงถึงข้อมูลส่วนตัวมากเมื่อเทียบกับกลุ่มที่ติดเชื้อ จึงมีการเปิดเผยข้อมูลส่วนตัวมากกว่า เช่น การระบุ ID Line หรือ Facebook account ในกลุ่มที่ไม่ติดเชื้อ ซึ่งการให้ข้อมูลที่มากกว่าการปกปิดนั้นมีผลต่อการได้คู่นอนในกลุ่มที่ไม่ติดเชื้ออย่างมีนัยสำคัญทางสถิติ($p<0.01^{**}$) เมื่อกล่าวถึงการใช้งานในลักษณะของบทสนทนาพบว่า ส่วนใหญ่ทั้งสองกลุ่มมีการสนทนาทั้งที่เป็นบทสนทนาทั่วๆไป และ บทสนทนาที่ล่อแหลมหรือเกี่ยวกับเรื่องเพศ ซึ่งจากผลทางสถิติแล้วพบว่า ทั้งสองกลุ่มไม่ว่าจะมีการสนทนาที่เป็นปกติทั่วไปหรือมีการกล่าวถึงเรื่องเพศแล้วนั้น สามารถส่งผลให้กลุ่มผู้ใช้งานสื่อสังคมออนไลน์มีความเป็นไปได้ที่จะได้คู่นอนจากช่องทางนี้ ($p<0.001^{***}$) ในประเด็นของการอัพโหลด หรือโพสต์รูปภาพในขณะที่มีการใช้งานของกลุ่มอาสาสมัครในงานวิจัยชิ้นนี้ พบว่า ในกลุ่มที่ติดเชื้อส่วนใหญ่จะโพสต์รูปที่ไม่เห็นหน้าตัวเองชัดเจน หรือ หลีกเลี่ยงการโพสต์รูปที่เห็นหน้า จึงมีการโพสต์รูปเรือนร่างของตนเองแทน ซึ่งการมีรูปแบบการใช้งานแบบนี้ส่งผลให้ผู้ใช้งานที่เป็นกลุ่มติดเชื้อมีความเป็นไปได้ที่จะได้คู่นอนจากช่องทางนี้อย่างมีนัยสำคัญทางสถิติ ($p<0.01^{**}$) ในทางเดียวกันกลุ่มที่ไม่ติดเชื้อที่มีการโพสต์รูปภาพตนเองก็มีความหลากหลายในการใช้งานซึ่งมีผลต่อการได้คู่นอนอย่างมีนัยสำคัญเช่นกัน ($p<0.01^{**}$)

สาขาวิชา	สาธารณสุขศาสตร์	ลายมือชื่อนิสิต .....
ปีการศึกษา	2561	ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

5878851853 : MAJOR PUBLIC HEALTH

KEYWORD: Online social media use Risky sexual behaviors and Men who have sex with men

Sasithorn Bureechai :

Online social media and applications use engaing in sexual risk behaviors among HIV infected Men Who have sex with men in Bangkok, Thailand. Advisor: Assoc. Prof. Chitlada Areesantichai, Ph.D.

The purpose of this study is to identify the pattern of social media use and risky sexual behavior of men who have sex with men in Bangkok, Thailand by using a mixed method.This is a cross-sectional study based upon quantitative and qualitative data collection. The target population is Bangkok MSM aged over 15 who visit a research institute for consultancy. The data collection took 6 months from June to November 2018, and the subjects participating in this study total at 201. All subjects respond to a set of close-end and open-end questions. The data is analyzed with SPSS V.22 with single and bivariate variables at the confidence level of 95%.

The infection status and the pattern of social media use are revealed in this study. Considering the infection status first, 71 subjects (35.3%) are HIV-positive and 130 subjects (64.7%) are HIV-negative.The results from this study yield that among the total of 201 participants, there are eighty percent of the HIV-positive are online users while approximately sixty percent of the HIV-negative are the online users. The statistical analysis shows that age is one of the factors that can influence the possibility of having sex partners from using online social media. The mean age of the HIV-positive are older than the HIV-negative : HIV-positive Mean age 34.78±11.78 Vs. HIV-negative Mean age 25.56 ±6.38 . Moreover, HIV-status has an influence on the possibility of having sex partners which can be seen from the number of sex partners they having had from online platform in a comparison between HIV-positive and HIV-negative. There are higher number of HIV-negative who reported having had sex partner from online platform than the HIV-positive. In addition, the HIV-negative tend to practice riskier behaviors if considering in the aspect of type of sex partners they have. Some of the HIV-negative reported having sex workers as their partners from their experience of using online while none of HIV-positive reported having this type of sex partners.As far as risky sexual behavior is concerned, the study found a risk related to HIV transmission and infection in both groups. Approximately seventy percent of the infected reported their consistent use of condom when engaging in a sexual intercourse. With a similar number of the non-infected, approximately seventy percent reported the use of condom when engaging in a sexual intercourse with partners whom they have met online. With the minority of this group reporting seldom use of condom. Regarding alcohol consumption for sexual stimulation, the study found only 5 % of the infected drink alcohol sometimes before having sex. This is in the contrary for the non-infected group where 52.1 % of the members used alcohol as sexual stimulant. Only a few subjects reported their independence of alcohol consumption for sexual stimulation. As for the use of drug to stimulate sexual desire with partners found online, the study shows the difference of the infected and the non-infected group which using drug to stimulate sex was found to be among the non-infected.

To summarize how online applications were utilized among MSM, of those who are online users have their own ways to approach strangers and end up with making a decision to meet in a person. However, the results from this study showed the variety of the patterns of using online social media in order to find sex partners. The findings also suggested with whatever reasons that motivate them choosing any application regardless of HIV-status they absolutely have possibility to get sleeping partners from the online venue. Other suggestions from the results of the study in terms of how online social media use. Of those who are online users regardless of their HIV-status, to create their profile whether they disclose their information or not they still having a possibility of having sleeping partners(*p-value 0.00*), whereas whatever conversation that they have would related to sex content or not, they have possibility of having chance of getting sleeping partners*(p-value 0.00*). In the similar context, regardless of they revealed their identity or not (*p-value 0.00*) , still have chance of getting sleeping partners which means they have possibilities of engage in having risky sexual behaviors later.

Field of Study:	Public Health	Student's Signature .....
Academic Year:	2018	Advisor's Signature .....

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Sasithorn Bureechai

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Acronyms

AEM: AIDS epidemic model

AIDS: Acquired immunodeficiency syndrome

ANC: Antenatal Care

ART: Antiretroviral therapy

ARV: Antiretroviral drugs

Global Fund: Global Fund to Fight AIDS, Tuberculosis and Malaria

HIV: Human immunodeficiency virus

IBBS: Integrated Biological and behavioral surveillance

MOPH: Ministry of Public Health

MSM: Men Who Have Sex with Men

NAP: National AIDS Program: Database program for antiretroviral treatment of NHSO

NAPHA: National access to antiretroviral drug for people living with HIV and AIDS

NAS: National AIDS strategies

NGO: Non-government organization

NHSO: National Health Security Office

PLHIV: People living with HIV and AIDS

PMTCT: Prevention of mother-to-child HIV transmission

PWID: People who inject drugs

STI: Sexually transmitted infection

TB: Tuberculosis

TG: Transgender people

UNAIDS: Joint United Nations Program on HIV/AIDS

USAID: United States Agency for International Development

WHO: World Health Organization

Chapter I

Introduction

1.1Background and Rationale

For over three decades, the government agencies and private medical organizations have been working tirelessly to eradicate HIV/AIDS from Thailand. In June, 2011, the country signed an agreement with the United Nation to prevent the spreading of HIV virus and keep the AIDS population in check by 2030. Upon the meeting, Thailand formulated the *Zero-Zero-Zero* strategy which stands for *Zero new infection, Zero AIDS death, and Zero AIDS stigma and discrimination* in effort to achieve the desired goal(CDC, 2019a; Center for Disease Control and Prevention, 2016). One of the first moves to implement the strategy is the launching of the "Test and Treat" policy, which encourages people to receive regular HIV check-up, so that individuals with HIV positive results can begin a treatment program regardless of their CD4 level.

The world was once optimistic about the future rate of HIV infection. The UNAIDS, for example, made a prediction that the global figures of new infection would decline by 8% between 2010 and 2015 and another 3% in 2016, which is a decline of 11% in total within a 6-year time frame, but the actual figures in 2016 suggest something quite the opposite, as the rate of infection had remained constant at 1.9 million per year on average since 2010*[2015 range of 1.7 million -2.2 million](UNAIDS, 2016b).* In high prevalence settings such as the Eastern, Southern, Western and Central Africa as well as the Caribbean, young women still stand a high risk of HIV infection(UNAIDS, 2016c). While in lower prevalence settings, HIV infection appears to be high among key populations such as people who inject drugs, sex workers, transgender people, prisoners and men who have sex with men(UNAIDS, 2016b). For example, men who have sex with men accounted for 12% of the new infection in 2015 with sex workers and people who inject drugs constituting 5% and 8% respectively.

While it is true that by the end of 2014 the rate of vertical transmission in Thailand had decreased to less than 2%, yet around six thousand people, many of whom

are the MSM, continue to discover their infection annually (UNAIDS, 2016a). The HIV prevalence among the MSM in Thailand increased to 8.0% in 2010 after which it stabilized until 2014(UNAIDS, 2016b).Again from the UNAIDS data report in 2017, HIV prevalence among people who inject drugs was 19.02% with rate of condom use as low as approximately 47.2%.The HIV prevalence among men who have sex with men was at 9.15% with condom use rate of 82% (UNAIDS, 2017).

It is understandable that there are several factors that lead people to get infected with the disease (CDC, 2018). However, one of the leading causes in this era is online social media (Ashlee N. Sawyer, 2017; ChingChe J. Chiu and Sean D. Young, 2015).People are now living in a modernized world, where the use of online technologies such as social media goes hand in hand with an increase in the degree of sexual risky behaviors among risky populations such as MSM and drug users (Young, Szekeres, & Coates, 2013). A recent study in the United States revealed that the use of online social media apps on handheld devices could increase the chance of obtaining sex partners whose likelihood of carrying at least one sexual transmitted disease apart from HIV was very high. Moreover, the use methamphetamine and frequency of unprotected anal inter-course were also reported in higher levels (Lehmiller & Ioerger, 2014; Stahlman et al., 2015).

Recent study on the way of the internet is used for relationship building has revealed that online communication fosters relationship building and improves communication between parties. Social networking sites are virtual places where people of similar interests gather to communicate, share, and discuss ideas. Needless to say these virtual places are increasingly an alternative for face-to-face interaction. There are many online applications on smartphones that inform the users of their nearby potential friends to whom they can send the users to send a greeting message to arrange an offline meeting.

The use of online social media among men who have sex with men is now an increasing concern as more and more MSM are utilizing online social media as a platform to engage in risky sexual behaviors. A study conducted by Boonchutima.S(Boonchutima S. and Sriwattana S., 2016) shows that there is a

significant association between the number of physical meet-ups and the number of locations where the application is used(r=0.415), the amount of time spent on application(r=0.368), and information disclosure(r=0.361). Another study(Boonchutima S., 2017) revealed that users of gay-dating applications have at some point been exposed to verbal and visual items that refer to drug or substance use. More than 50% of gay-dating apps users have been persuaded to engage in substance use by people whom they have met online. Approximately one third of application users reported to have been persuaded to engage in substance use via dating application or online venue.

This ominous phenomenon calls for a need for an in-depth understanding of MSM social media use and their sexual risky behavior. Accordingly, this study is intended to explore (a.) the pattern of online social media use among the HIV-positive and HIV-negative MSM (b.) risky sexual behaviors of MSM who have sleeping partners from online venues within the last one year. The association of online social network use and risky behaviors will be determined by qualitative analysis.

1.2 Research Questions

1. What are the patterns of online social media use between MSM who are HIV-positive and MSM who are HIV-negative?

2. What are the sexual risk behaviors displayed by HIV-positive and HIV-negative MSM who use online social media?

3. Is the use of online social media associated with sexual risk behaviors among MSM?

1.3 Research Objectives

1.To identify the patterns of online social media use by HIV-positive and HIV-negative MSM in Bangkok.

2. To determine sexual risk behaviors between HIV-positive and HIV-negative MSM who use online social media in Bangkok.

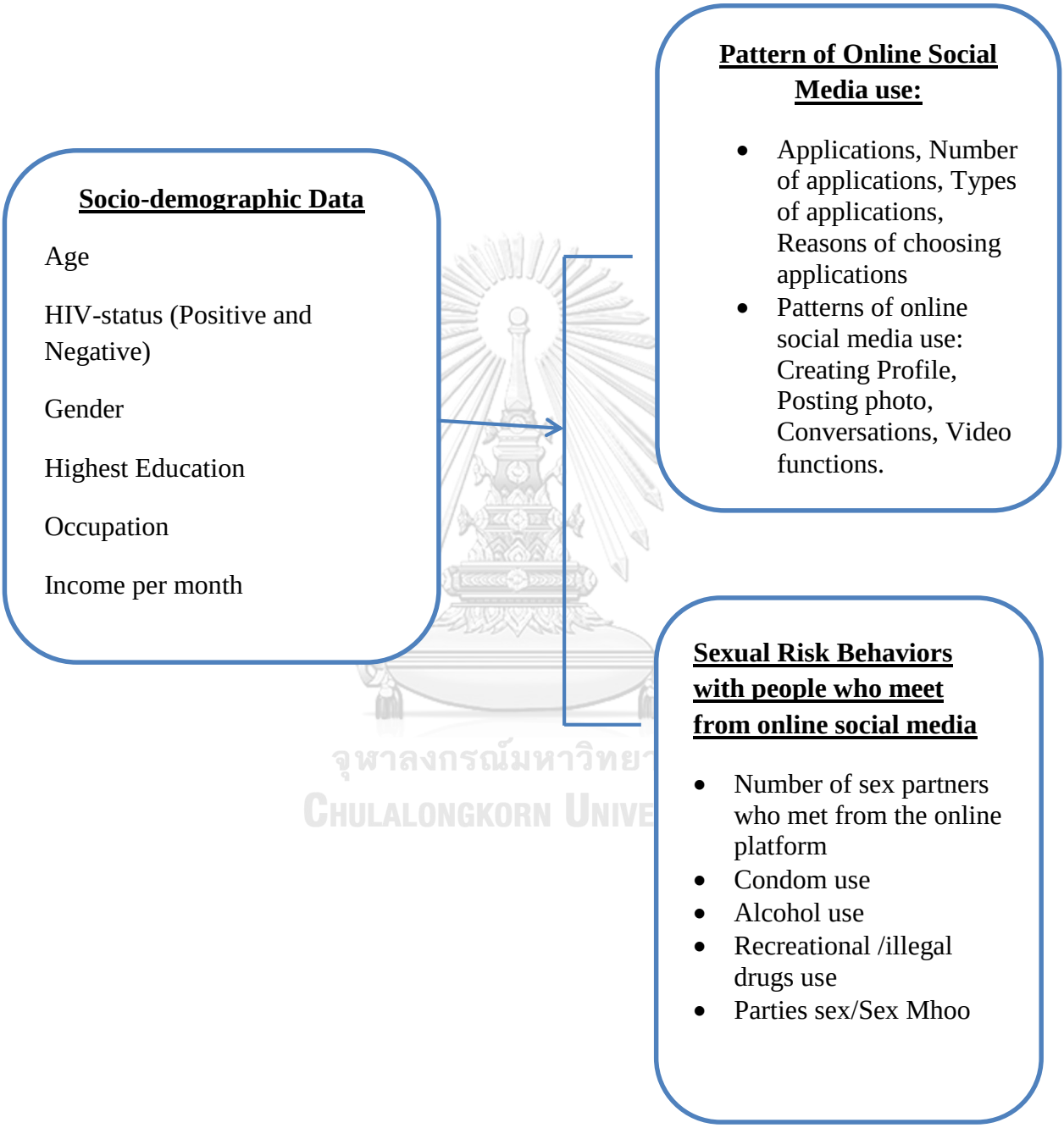
3. To find an association between patterns of online social media use and sexual risk behaviors among MSM in Bangkok.

1.4 Research Scope

The research aims to explore how social media are used by the MSM and what kinds of risky sexual behaviors are displayed by MSM app users. As far as their social media use is concerned, this study hopes to identify the types of social media apps used by the MSM, number of social media applications used, the most frequently use application, how profile is created, how conversation is carried out, how photos are posted, and how video streaming is utilized, the duration of time spent to arrange a meeting in a person, places where the applications are normally used, and activities related to engagement in risky behaviors. A semi-structure interview with open-end questions is designed to explore their use of social media in details. The second part of the questionnaire is intended to explore risky sexual behaviors among online social media users across several domains: condom use, multiple sex partners, alcohol use, and drugs use before having sexual activities. The qualitative analysis is used to explain how social media is used and reasons for choosing certain online social media app as a venue to find sleeping partners.

1.5 Conceptual Framework

Independent Variables **Dependent Variables**



1.6 Operational Definitions

Bisexual refers to men who are sexually attracted to both male and female gender.

CD4 cells count refers to the number of CD4 (helper T cell lymphocytes) counted as an indicator of treatment.

Frequency: The rate at which something occurs over a particular period of time or in a given sample.

Gay refers to men who have biological gender as a man but their sexual orientation is attached to the same sex person.

Gender refers to characteristics and traits socio-culturally considered appropriate to males and females. In this study, gender is also included those who identified themselves according to socio-culturally considered specific to Lesbian, Gay, Bisexual, and Transgender people.

HIV seropositive refers to people who are infected with the HIV virus by the confirmation of the positive Anti-HIV by blood sample testing.

HIV seronegative refers to people who are non-infected with the HIV virus by self-report from the participants and of those who reported HIV- negative which could possibly confirm by the negative Anti-HIV test among those participants who have tested for the HIV.

HIV status refers to a person who has status of HIV infection which is confirmed by a report of positive blood testing for HIV.

Men who have sex with men refer human being whose sex at birth is male but appears to be emotionally attached with the same sex. Male persons who engage in sex-related activity with the same sex, regardless of how they identify themselves. They may identify as gay, homosexual, and bisexual.

Male refers to a straight gender which is identified as male gender at birth.

Pattern of online social media in this study refers to how people use online social media applications in terms of creating profile, posting photo on the online platforms, carrying the conversation, and using Video functions which are available on each particular app.

Sex partners refers to an individual who participates in sexual-related activities. In this study, sleeping partners are also refers to those individuals who participate in sexual-related activities.

Sexual risk behaviors refer to the sexual behaviors especially among men who have sex with men population which considered at risk. In this study, sexual risk behaviors are identified as the following aspects; having multiple partnership, condom use, alcohol use before having sex activities, using

Relationship status refers to a relationship that men who have sex with men identify as their perception which related with sexual orientation and sexual activities.

Sexual Orientation refers to an individual's emotional, romantic and sexual attraction to particular gender both male and female.

Viral Load (VL) refers to the number of viral load in the blood measured in copies per milliliter cubic.

Social Network site is the plate form allowing people to use the internet in several different purposes. In this study, social network sites are related to sites where allow people to communicate to other people which categorized into two different types which are general online social media application and dating online social media appliations.

General Online Social media applications: in this study, the online social media applications which using for communication in a general purpose include Facebook , Line, Twitter, and Instagram.

Dating Online Social media : in this study, the online social media applications which using for communication in a well-specified purpose as seeking for sleeping partners or sex partners include Hornet, Grindr, Jack'd, Blued, and or other applications such as Beetalk, Growrl, and Tinder.

Mixed Methods study: A study conducted with focusing on collecting and analyzing in mixed methods both quantitative and qualitative data.(Creswell, 2011)

Chapter II

Literature Review

2.1 Human Immunodeficiency Virus

The year 2527 B.E. first saw the outbreak of a sexually-transmitted disease, which later became medically known as HIV or Human Immunodeficiency Virus, but Thailand, unlike other medically advanced western nations at that time, did not have the capacity would allow HIV to be treated in the same fashion as other viral infections. So in retaliation to the new invader, Thailand had to employ both proactive and reactive approaches. For example, three decades ago, the Thai government had organized a campaign in effort to combat the spread of HIV as part of the strategy to eradicate this epidemic. Ironically though, the campaign resulted in a rather unexpected outcome. Through public mass media, HIV was portrayed as a deadly disease and anyone who happened to contract it would have no other choice but lie hopelessly in their dead bed. During that time, receiving a proper treatment for HIV was extremely difficult as the disease was not recognized in the healthcare policy. For that reason, people who had been diagnosed with HIV were only treated for the complications they experienced until their body gave up.

Moreover, the society back then did not distinguish between patients infected with HIV and those who developed AIDS. However, based on several studies, HIV patients and AIDS patients are totally different. For example, according to WHO and CDC, Thailand Department of Health, HIV is Human immunodeficiency virus and once it enters the system, and it could lead to AIDS. WHO states that HIV is a kind of virus that infects and gradually wears down the immune system, making the patient increasingly more vulnerable to diseases to the point where the immune system no longer functions and that is a full blown stage of HIV infection called AIDS(World Health Organization, 2017).

The U.S. Department of Health and Human Services also known as AIDS*info* considers HIV to be the virus that causes AIDS, which is the most severe stage of HIV infection. There are actually two species of this retrovirus called HIV: HIV-1 and HIV-2. These two types of virus are transmittable through direct contact with body

fluid such as blood, semen and vaginal discharge of an HIV-infected person. It can also be transmittable through breast feeding as the breast milk is contaminated with the virus(AIDSinfo, 2019b).

Centers for Disease Control and Prevention considers HIV to be virus that attaches itself to body fluids, and once it enters the system it will destroy the CD4 cells also known as T cells, driving down their numbers and reducing their ability to fight off invaders. Without proper treatment, the number of CD4 will drop to the point where the body has zero line of defense, and that means the patient has reached the most severe stage of HIV infection called AIDS(CDC, 2019a).

Based on the cited source of information, a person who is infected with HIV virus is an HIV patient. However, if the patient does not receive a proper treatment to maintain the CD4 level just in time, the immune system will deteriorate to the point where the patient will be completely vulnerable to diseases. Once this happens, the person is said to have entered the stage of AIDS. On the contrary, if a person who is infected with HIV receives medication early enough for the CD4 cells to restore themselves, that person will be prevented from developing AIDS and hence will not be called an AIDS patient.

2.2 Acquired Immunodeficiency Syndrome or AIDS

According to WHO, AIDS which is abbreviated from Acquired Immunodeficiency Syndrome is the most severe stage of HIV infection. An AIDS patient could be dealing with more 20 other opportunistic infections.(WHO, 2016) According to Center for Disease control and Prevention, there are three stages of HIV infection development, namely: Acute HIV infection, Clinical latency (HIV inactivity or dormancy) and Acquired immunodeficiency syndrome (AIDS).

There are three stages in the disease progression. According to Centers for disease control and prevention, there are three stages of HIV that understandably found among who are living with HIV(CDC, 2019b).

Stage 1: Acute HIV infection

The early stage of HIV infection according to CDC is the first two to four weeks. During this stage, the patient will show Flu-like symptoms, which is a natural response to the infection. These symptoms may last for few weeks. Technically, first infected people might not aware that they have virus in their bodies and normally the number of virus is significantly high. By the time, the patient enters the Acute HIV infection stage, the virus has already spread throughout his or her body, even though the patient may not even be aware of that. This period of time, new infected people can possibly pass the virus and spread the infectious disease to others people if those of them keep behaving in the manners of having sexual risk behaviors.

Stage 2: Clinical latency (HIV inactivity or dormancy)

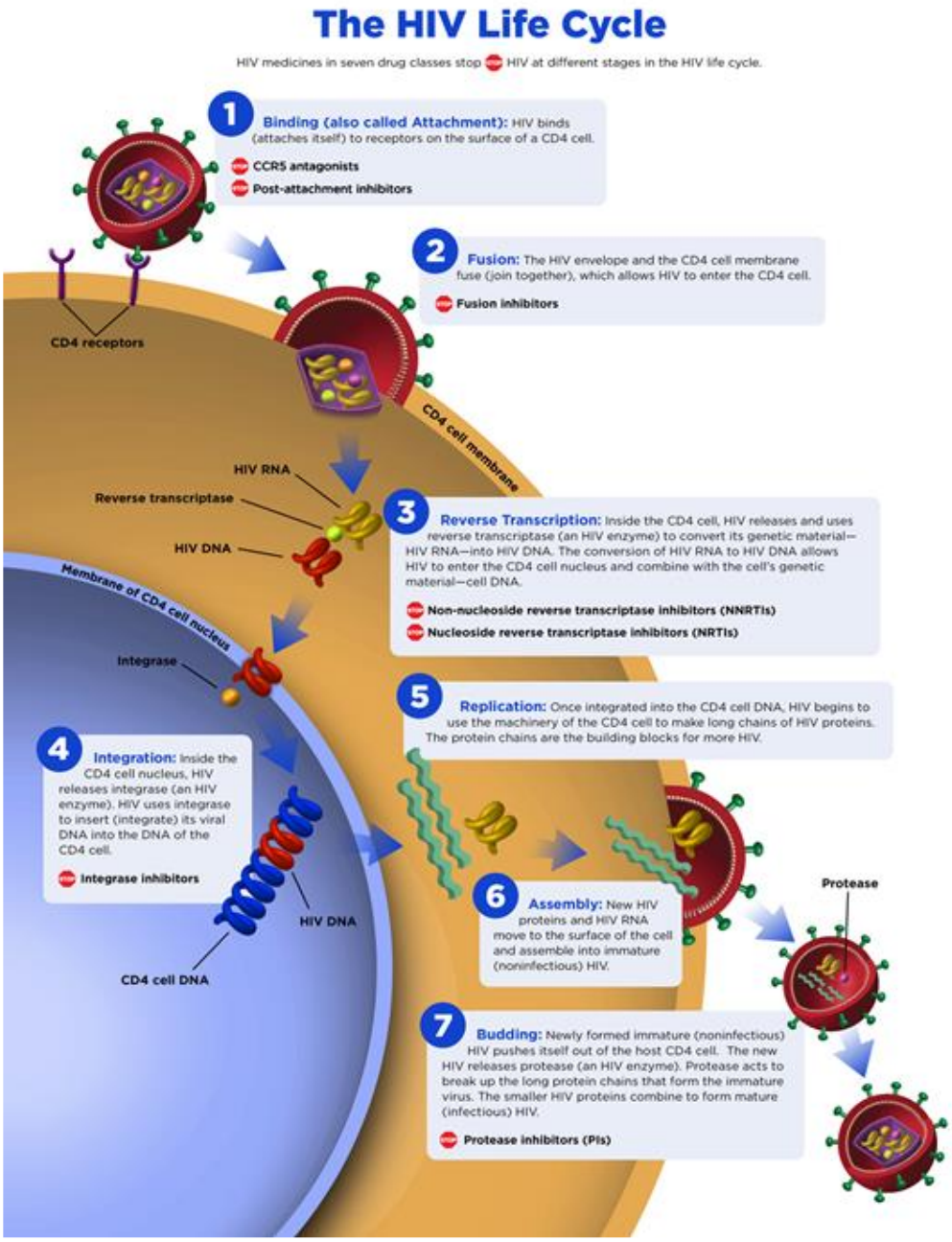
This period may be called as asymptomatic HIV infection or chronic HIV infection. After four weeks, the patient will enter Asymptomatic HIV infection or Chronic HIV infection. In this stage, the virus remains dormant in the patient's blood with little noticeable effect on the body, which means that the patient may still feel healthy. In some cases, an infected patient may be able to live several years in the latency stage but will eventually enter the stage of AIDS. However, if infected person receives antiretroviral drugs in time and maintains the drug adherence, the virus will be suppressed, and the immune system will return to a normal stage allowing the patient to survive for several decades. During this phrase, people may not have any symptoms or illnesses at all and can last longer for a decade or even longer than that but some may develop severe symptoms faster than others depending on attributed factors. It is important though to note that even with medication, an infected individual in the latency stage is still capable of transmitting HIV and other diseases through unsafe sex practice. Moreover, failure to adhere to medication will cause the HIV to overpower and impair the immune system and eventually the patient will be completely defenseless to diseases and is considered to have developed AIDS.

Stage 3: Acquired immunodeficiency syndrome (AIDS)

In the third stage or AIDS(Acquired immunodeficiency syndrome), a patient who has not received the treatment will be able to live up to three years on average with more than 10 other opportunistic diseases. Most AIDS patients tend to experience fever,

lymphadenopathy and rapid weight loss. Their CD4 cells count will be less than 200 cells /mm^3, and a large number of HIV can be found in every 1 mm3 of blood. Likewise, AIDS info under supervision of US Department of Health and Human Services considers AIDS to be the final and the most severe stage of HIV infection. Patients who have developed AIDS have CD 4 less than 200cells/mm^3. AIDS is the most severe phase of HIV infection. People with AIDS have such badly damaged immune systems that they get an increasing number of severe illnesses, called opportunistic illnesses. Without treatment, people with AIDS typically survive about 3 years. Common symptoms of AIDS include chills, fever, sweats, swollen lymph glands, weakness, and weight loss.

HIV Life cycle and Progression



Credited From: AIDS Info U.S. National Library of Medicine (AIDS*info*, 2019a)

HIV Life-cycle

1. Binding and entry

In this stage, the virus will bind with plasma membrane of the cell through glycoprotein binding with the receptor on the cell surface such as CD4 or Chemokie receptor.From this point onward, the core part will infiltrate into cell's cytoplasm and form three different types of enzyme including RT, integrase and protease(MOPH, 2017).

2. Uncoating and reverse transcription

Once the viral core has entered the cell, it will then uncoated in which the genome and enzyme are released from the core particle and convert RNA to DNA with the enzyme RT(MOPH, 2017).

3. Nuclear entry

DNA enters the nucleus through nuclear membrane as the proviral DNA will interact with other protein to form pre-integration complex with integrated enzyme(MOPH, 2017).

4. Integration and transcription

Enzyme called "Integrase" will integrate in the chromosome of HIV virus where could not identify exactly location but it is called provirus. Then, after that the process of DNA transcription by RNA polymerase II in host cell will take place whenever there are inducing factors(MOPH, 2017).

5. Translation, assembly and budding

The new transcript genome of virus will be translated into proteins in nucleus of each cell. Plasma membranes of host cells are going to bud other cells and finally they can possibly spread an infection to adjacent cells to be infected(MOPH, 2017).

2.3 HIV testing

Nowadays, acute infection with HIV virus could be tested not very immediately after infection but at least 14 days after infection could possibly detect an acute HIV infection. However, it depends on the types of testing. According to Centers for Disease

Control and Prevention, there are three types of HIV diagnostic tests including nucleic acid test(NAT), antigen/antibody tests, and antibody tests(Centers for Disease Control and Prevention, 2018).

Thailand ministry of Public Health also provides information for more understanding about HIV testing and screening.

Screening Test

Screening tests can be divided according to different methods. Each of methods has specific sensitivity and specificity. Generally, there will be only one time testing if the result is negative. In case the result is positive, other methods should be done to confirm the positive result. The followings are different methods for screening tests.

ELISA (Enzyme Linked Immunosorbent Assay)

According to Thailand National Guidelines on HIV/AIDS Treatment and Prevention 2014, the standard methods to test for Anti-HIV are ELISA (enzyme-linked immunosorbent assay), agglutination assay, and dot or line immune assay. The method of HIV test kit used to detect antigen and antibody is the same as that of ELISA. Genetic material of HIV virus will be tested in order to diagnose people with HIV infection. Protein called p24 is the specific genetic material of HIV virus. Generally, during window period the protein is undetectable. The genetic material can be detected through a qualitative assay by using NAT (nucleic acid amplification testing). NAT can help to detect RNA of virus in the plasma or proviral DNA attached to affected cells. However, regardless of the test results, Anti –HIV should be done to confirm the diagnosis(Department of Disease Control, 2014).The method is the most popular and takes only 2-3 hours to process and analyze the results.

Confirmatory Tests

The high sensitivity of confirmatory tests strengthens the reliability for detecting HIV infections. The purpose of such tests is to prevent any the false positives as a result of

primary tests. However, the confirmatory tests should not be used to confirm the negative results.

Western Blot (WB)

This is a standardized method with tool kits available for purchase. The tool kit contains chemical buffer and a stripe indicating different protein components of HIV. The stripe comes in different sizes distinguished by electrophoresis method. The reading and analysis can be done conveniently and the result can be obtained within 6-24 hours. The test is more expensive than initial testing. Currently, the WHO has recommended that two different methods of initial testing be used. The WHO has recommended that two different filter methods be used instead of Western Blot. A person who conducts the Western Blot test must specify whether the result is positive, negative or indeterminate. In case the result is indeterminate, a repeated test will be necessary. The test result will turn positive within 6 months if the patient was actually infected with HIV. Moreover, the WB stripe from some company contains antigen gp36 of HIV 2. The other will be used to confirm the result.

Indirect Fluorescent Antibody Assay (IFA)

This is another method with the kit prepared by a team from medical science. The kit is comprised of glass slides coated with MT4 cells with and without infection in the 3:1 ratio. The diagnosis is performed through the reaction between antibody in the serum and HIV antigen in the cell. The anti-human IgC FITC will be conjugated which will glow with a fluorescent microscope. The sensitivity of IFA and WB is very close but an experienced specialist is required to read the test performed with the IFA

Radioimmunoprecipitation assay (RIPA)

This method is similar to the WB but it is much more complicated as the virus needs to be cultured in the amino-based food. It also requires a high-security lab to perform autoradiography.

2.3.1 Tests under Research and development

HIV Antigen Test

This test is useful for an emergency case as well as mother-to-child infection. The test can also be used to detect any HIV antigen in blood transfusion to double check for any errors. One downside of checking for antigen is that it can be costly, time consuming and it may require confirmatory tests Current to detect, there is a limited number of producers with poor quality control.

Line immunoassay

The test is similar to WB except that the antigen used is recombinant protein and synthetic peptide is coated directly on the membrane. There is gp36 of HIV2 but there is only one 36.

Genetic detection

The technique incorporates the PCR as it will try to detect DNA from proviral DNA. The technique increases the size of DNA with DNA polymerase by specifying the size and sensitivity which is oligonucleotide. The PCR technique is highly sensitive but the expense of false report in case of contamination. Currently, the PCR technique is very useful for testing the HIV infection from a mother to a child.

Other tests that are undergone researches including a test for infection in others body fluids such as saliva, urine, and lactate.

2.4 HIV transmission and attributed factors

Associated Factors Attributed HIV infection

There are numerous factors that can contribute to the risk of HIV infection among men who have sex with men which include biological factors, behavioral factors, social and cultural factors.(CDC, 2016)

Biological factors, it is understandable that men who have sex with men (MSM) have sexual intercourse via anal route, and unprotected anal sex carries a higher risk than vaginal route. Anatomically, since the anus wall is much thinner than the vaginal wall, there is a higher risk of the anus wall being torn apart during the sexual intercourse,

which creates an open gate way for HIV virus to get into bloodstream easily. Moreover, men who have sex with men are more often not aware of having an unprotected sex with person who has recently become infected. A study in London, United Kingdom shows that 27% of the infected received the virus from partners who had recently been infected with the HIV virus (Avert, 2016).

Behavioral factors, it is commonly known that among this particular group, having multiple sexual partners is common. Despite a campaign to promote the use of condom for HIV prevention, whereby everyone receives a free condom, the unprotected sex continues to exist. Likewise, although the access to HIV testing is significantly improved, the rates of HIV testing remained unchanged. A survey study in Thailand in 2013 conducted by Johnston, L.G., Steinhaus, M.C., Sass, J. et al. found that almost three quarters of young men who have sex with men in Bangkok and Chiangmai, only 27% had an HIV testing(Johnston et al., 2016). The prevalent use of alcohol and recreational drugs among the MSM can increase the possibility of unprotected sex with one or more partners which elevates the vulnerability to HIV.

Social and cultural factors, many men who have sex with men have experienced stigma, discrimination and even violence. For this reason, men who have sex with men would hide their identity and sexual orientation (WebMD, 2017). Moreover, they are more likely to experience depression due to social isolation and disconnectedness. This can make it difficult for them to cope with the issue of HIV, which affects the adherence to medication and treatment.

HIV Transmission

In the United States, the center of disease control and prevention (CDC) has made an effort to educate the public on the transmission of HIV. In the US, HIV is spread mainly by having an unprotected anal or vaginal sex with someone who has a high viral load. For the HIV-negative partner, receptive anal sex (bottoming) is the highest-risk sexual behavior, but HIV infection can be gotten from insertive anal sex (topping). Either partner can get HIV through vaginal sex, though it is less risky for getting HIV than receptive anal sex.

Sharing needles or syringes, rinse water, or other equipment (works) used to prepare drugs for injection with someone who has HIV. HIV can live in a used needle up to 42 days depending on temperature and other factors.

Less commonly, HIV may be spread from a mother to her child during pregnancy, birth, or breastfeeding. Although the risk can be high if a mother is living with HIV and not taking medicine, early diagnosis and admission to the treatment programs have lowered the number of babies who are born with HIV.

Despite some very rare cases, HIV can also be transmitted by Oral sex—putting the mouth on the penis (fellatio), vagina (cunnilingus), or anus (rimming). In general, there's little to no risk of getting HIV from oral sex. However, it is theoretically possible if an HIV-positive man ejaculates in his partner's mouth during an oral sex.

Receiving blood transfusions, blood products, or organ/tissue transplants that are contaminated with HIV was more common in the early years of HIV, but now the risk is extremely small.

Eating food that has been pre-chewed by an HIV-infected person would yield low possibility of getting HIV infection. The contamination occurs when infected blood from a caregiver's mouth mixes with food while chewing. The only known cases are among infants. Being bitten by a person with HIV, each of the very small number of documented cases has involved severe trauma with extensive tissue damage and the presence of blood. There is no risk of transmission if the skin is not broken. Contact between broken skin, wounds, or mucous membranes and HIV-infected blood or blood-contaminated body fluids. Deep, open-mouth kissing if both partners have sores or bleeding gums and blood from the HIV-positive partner gets into the bloodstream of the HIV-negative partner, HIV is not spread through saliva (Center for Disease Control and Prevention, 2016).

2.5 Current global HIV situation

Since the beginning of the epidemic, UNAIDS has recorded and reported the global HIV statistics. The data was updated at the end of 2016, there were 76.1 million [65.2 million- 88.0 million] people who have become infected with HIV since the start

of the epidemic while there were 36.7 million [30.8 million-42.9 million] people who are living with HIV; 34.5 million[28.8 million-40.2 million]are adults and 2.1 million[1.7 million-2.6 million] are children(UNAIDS, 2016b). As of 2016, 19.5 million [17.2 million-20.3 million] people living with HIV were accessing antiretroviral therapy, up from 17.1 million [15.1 million-17.8 million] in 2015 and 7.7 million [6.8 million-8.0 million] in 2010. There were 35 million [28.9 million-41.5 million] people have died from AIDS-related illnesses since the start of the epidemic and in 2016, there were 1.8 million [1.6 million- 2.1 million] people died from AIDs-related illnesses(UNAIDS, 2016b).

New infections worldwide, people became newly infected with HIV in 2016 were 1.8 million [1.6 million – 2.1 million]. Since 2010, new HIV infections among adults declined by an estimated 11%, from 1.9 million [1.6 million- 2.1 million] to 1.7 million [1.4million-1.9 million]in 2016. New infections among children were also declined by 47% since 2010, from 300,000 [230,000-370,000] in 2010 to 160,000 [100,000-220,000] in 2016(UNAIDS, 2016b).

HIV prevalence and global trends

Nowadays, every region of the world is concerned about an increase in the number of the HIV-infected population including men who have sex with men, sex workers and drug users. Surprisingly, it is found that even though the trend of HIV infection is decreased, men who have sex with men have a much higher rate of HIV transmission than other general population. This is due to their risky sexual behavior of having an orgy or a group sex.

Since the beginning of the disease, more than 70 million have been infected with HIV virus. At the end of 2015, approximately 36.7 million people were living with HIV infection worldwide. Due to the rapid spread of the disease, an estimate 0.8% (0.7-0.9%) of adults aged 15-49 years is living with the disease. Particularly in South and South East Asia, 13% of adults living with HIV have been revealed by the UNAIDS (2010) Global report on the AIDS Epidemic. There are 4,000,000 adults aged over 15 years who live with the disease. The number of people who are living with HIV in Thailand was approximately 440,000 people in 2015 [UNAIDS, AIDSINFO]. With an

incidence rate of 0.02 among adults in Thailand, the number of new patients hovered at around 6,300- 7,600 annually. This is because the HIV prevalence among men who have sex with men went up to 9.2 in 2014(UNAIDS, 2016a).

The global trend of the new cases of HIV virus infection is now switching from heterosexual population to homosexual population especially among Men Who Have Sex with Men (MSM). The illustrated evidence among this particular population is using illicit drugs as a bridge to get viral transmission. Having multiple sex partners was significantly identified to be a predictor for unprotected anal intercourse and recreational drugs use among men who have sex with men in Thailand (H.Holtz Timothy, 2014). The global situation has worsened when seeking sex has become a reason for using the internet for men who have sex with men nowadays (Elford, 2003).In the U.S., men and homosexual men who attend the STD clinic were found using the internet for seeking sex partners(Rhodes, 2002).

2.5.1 Asia and the Pacific

In 2016, there were 5.1 million [3.9 million–7.2 million] people living with HIV in Asia and the Pacific. In 2016, there were an estimated 270 000 [190 000–370 000] new HIV infections in the region. New HIV infections declined by 13% between 2010 and 2016. In Asia and the Pacific, 170 000 [130 000–220 000] people died of AIDS-related illnesses in 2016. Between 2010 and 2016, the number of AIDS-related deaths in the region decreased by 30%.

Treatment coverage was 47% [31–69%] among people living with HIV in Asia and the Pacific. An estimated 2.4 million [2.1 million–2.5 million] people had access to antiretroviral therapy in Asia and the Pacific in 2016. There were 15 000 [7700–26 000] new HIV infections among children in Asia and the Pacific in 2016. Since 2010, there has been a 38% decline in new HIV infections among children in the region.

2.5.2 Current HIV situations in Thailand

Overview of the AIDS epidemics in Thailand

HIV burden: from "2015 Thailand Global AIDS Response Progress Reporting"

Using the AIDS epidemic model (AEM) for adults (aged 15+ years) and Spectrum for children (aged less than 15 year), there were estimated 7,816 new HIV infections, 20,492 AIDS related deaths and 445,504 persons living with HIV (PLHIV) at the end of 2014 in Thailand. Females account for 39% of total adult PLHIV and 47% of children living with HIV.

Currently, one of the outstanding prevention programs between mothers to child transmission in Thailand would be claimed to be one of the most successful situation. According to the infection rate between babies who were born from mother who are infected with the disease has dramatically decreased with the obvious evidence of transmission rate in 2014 which was 2.1% comparing to transmission rate in 2010 , it was 41% decrease from 2010 to 2014.UNAIDS reported the statistic in 2016, around 76% [60%-88%] of pregnant women living with HIV had accessed to antiretroviral medicines to prevent transmission of HIV to their babies(UNAIDS, 2016b). Since the beginning of 21st century, Thai government has tried to promote and provide health care services including antiretroviral drugs and HIV testing to Thai people. What more important is people are able to access to universal coverage which cover HIV treatment. However, there are many thousands of people unaware of their status and refuse to get test for HIV. Therefore, hidden HIV infected people still have been undetectable and difficult to estimate the number of people who are infected.

2.5.3. HIV prevalence among MSM

HIV prevalence among men who have sex with men varies across the country depending on where exactly is. In Bangkok, HIV prevalence was 28.6 % in 2014. Of those who are newly infected with the virus, 50% were among men who have sex with men, male sex workers, and transgender people(Avert, 2016). A study in Thailand shows an explosive epidemic of HIV infection in a cohort of men who have sex with men in Thailand. The results illustrated 21.3% (n=372) of HIV prevalence at baseline and after sixty months follow up the cumulative HIV-incidence was 23.9% (n=222)

with overall HIV-incidence density was 5.9 per 100 per person-years(Frits van Griensven et. al, 2013). While Thailand epidemic modeling suggests that 43% of new HIV infection in 2015 occurred among men who have sex with men. Another study showed the HIV incidence was 7.4 per 100 person-years in Bangkok, Thailand.

2.6. Sex and Gender

2.6.1 Sex and gender

Differences between sex and gender, the term “sex” refers to biological differences between male and female which can be identified by physical and physiological appearances(Little, 2014). Theoretically, humans are born with 23 pairs of chromosomes and the X and Y chromosomes can indicate humans' sex after conceive phase from the beginning of prenatal development by which 46 chromosomes or 23 pairs and XX are mostly female(23XX) and 23 pairs and XY are mostly male(23XY)(World Health Organization). Results from two processes, sex determination and differentiation are biological differences between male and female(PN., 1993) cited by(World Health Organization). The biological process of sex determination controls the differentiation pathways either male or female will be followed which the process involves genetics regulation and hierarchy development(F.Willard, 2003). Mostly, more than 95% of chromosome Y is specific for male and Y chromosome is able to induce testicular differentiation of the embryonic gonad(F.Willard, 2003). The Y chromosome possibly induces male phenotype while humans who have X and X chromosomes mostly represent female. While humans who are assigned sex from the beginning of gestational age until born with enabling to change, gender has become crucial in the context of social and cultural influences. An individual's sex, as determined by his or her biology, does not always correspond with his or her gender. For that reason, the terms sex and gender are not interchangeable.

Gender, typically, is described by social context in terms of masculinity and femininity. Social construction varies across different cultures and over time. In the same way "gender identity" is the extent to which one identifies as being either masculine or feminine. There are different cultures in which greater gender diversity exists and it would be true that sex and gender are not always perfectly divided along binary lines

such as male and female or homosexual and heterosexual(Little, 2014; World Health Organization).

2.6.2 Gender Roles

It is typical for children to be influenced by people in their social environment as they grow from one stage to another and it is inevitable for them to be introduced to certain roles which are dependent on their biological sex.

In effort to clarify *gender role*, this is essentially a concept that dictates the way certain men and women should behave according to their society's norms and standards. For example, in Canadian culture, men are viewed to be superior in strength, aggression and dominance but women tend to have the qualities of nurturing and subordination. An interesting fact is that all of us learn our roles when we are only infants. This is particularly obvious in child clothing industry where outfit for boys comes in a variety of blue shades, while girl outfit is almost every time spotted with pink colors. These color-coded gender labels are not applied after birth but when they are in their mother's womb.

Regarding gender roles, the way boys learn their social roles is associated with the toys supplied by their parents. It is typical to see boys playing with trucks, guns and superhero paraphernalia, and these toys do have their hidden effects, as children who play these kinds of toys will have improved motor skills, aggression and the ability to play in isolation. Girls on the other hand are typically seen with dolls, and dress-up apparel, which promote nurturing, social proximity and role play. In most cases, children will choose to play with toys that are appropriate to their gender, but there is a possibility that children play with cross-gender toys if they are praised by or playing with their parents (Caldera, 1998). Later on in their life, they will feel the drive play their masculine and feminine roles. This is why men tend to dominate women in professions such as law enforcement and military while occupations such as child care, health care, and social work are practiced by more women than men. The differences

in occupational roles between men and women are examples of how men and women learn to assume different roles as in the Canadian culture. However, although men and women feel compelled to satisfy what is expected of them in their society, it does not mean they would choose to do so if they had a different choice(Diamond, 2002).

2.6.3 Gender and Socialization

It is not uncommon to hear someone say “boys will be boys” to justify mischievous behavior such as pushing, shoving and several other acts of young boys that show aggression. This is an implication that boys are made with this kind of behavior by nature. Aggressive behavior is not necessarily a bad thing as long as it does not do harm to someone. In fact, according to cultural script of masculinity, aggressive behavior is what earn boys and men acceptance in their peer groups. In a way, the roles men and women assume in their society are similar to scripts but instead of being written by playwright, it is a script written by society and it is not learned by memorization. It is learned through a process known as socialization, where people behave according to their social norms.

2.6.4 Socialization

According to Cross-cultural studies, boys and girls learn at the age around two or three that the society has different expectations for them. When they reach the age of five, they become firmly entrenched in roles deemed appropriate for their genders(Kane, 1996). These are the roles that they learn through socialization which allows them to know how they should behave based on societal values, beliefs and attitudes. To give an example, the riding of a motorcycle is considered to be one of the masculine activities, a role played by the male gender. This attitude is associated with a gender stereotype which involves overgeneralizing about the attitudes, traits, or behavioral patterns of women or men. For example, women may be thought of as too timid or weak to ride a motorcycle.

Family, education, peer groups and mass media are agents of gender socialization. Each one of these agent creates and maintain expectations that are accepted as norms which reinforce the gender roles.

The first agent of socialization is family. A lot of evidence suggests that sons and daughters are socialized differently by their parents. Generally speaking, girls are given more freedom to step outside of their prescribed gender role(Coltrane, 2008; Kimmel, 2000; Raffaelli, 2004).However, differential socialization typically gives boys some privileges. For instance, sons are more likely to be put in charge of themselves. They have more independence and freedom to make their own decision than daughters. They do not have to worry much about clothing, dating habits, or curfew. Sons are also often exempted from domestic duties such as cleaning or cooking and other household tasks that are considered feminine. Daughters on the other hand are limited by their expectation to be passive, nurturing, and generally obedient, and to assume many of the domestic responsibilities.

Despite how parents try to establish gender equality, some indications of inequality still exist. This is typically seen in many households where boys are usually given tasks that require strength and toughness such as taking out garbage, while girls are asked to exercise their neatness and care by performing duties such as folding laundry. Some studies show that fathers are expected to be physically firmer than mothers to conform to the gender stereotype (Kimmel 2000). As a result, boys can understand it when their fathers disapprove of some feminine-like activities they engage in like singing or dancing(Coltrane, 2008). It is important to bear in mind that parental socialization and normative expectation can vary depending on social class, race and ethnicity, and African American families tend to prefer egalitarian role structure for their children than the Caucasian families (Staples, 2004). When a child is old enough to go to school, they continue to have to comply to the gender role. Until very recently, schools made some effort to segregate boys from girls and they do this by encouraging girls to take up home economies or humanities while promoting subjects like math and science to boys.

Gender socialization is an ongoing phenomenon today at schools(Lips, 2004). Sometimes, it is something that teachers are doing on a regular basis such as arranging seats according to gender without realizing the impact it has on gender behavior making boys and girls feel that they should be treated differently. The influence of gender role can be felt even in kindergarten. This is because schools keep sending subtle messages

which indicate how boys are more important and more intelligent than girls. For example, some study suggests that male students are praised excessively far more than girls. Aside from the praise, there are times when teachers won't let girls finish speaking in class to give boys more opportunities to reflect or demonstrate their knowledge(Sadker, 1994). Boys are also positioned differently from girls in social. For example, school teachers like to promote a sense of competition(Thorne, 1993). Boys have more opportunities and freedom to engage in acts of deviance and they are often pardoned when breaking rules, whereas girls are expected to be obedient and their acts of deviance will not be tolerated (Ready, 2001). It is therefore undeniable that school is a major contributing factor in gender role segregation in the way they position boys and girls in competitive arrangement.

Children show the first step of development of a separate sense of self by imitating the actions of significant others (Mead, 1967). Children can facilitate and apply normative gender expectations to people around them in the same way as adults. If they fail to conform to the norm deemed appropriate for their gender role, they risk being criticized or rejected by the peers. While these sanctions may seem information, they can have ramifications. For example, a girl who opts dance lessons for karate class can be regarded as a tomboy and she have to a hard time fitting in with her social group(Ready, 2001), and this could be worse for boys if they fail to conform with their gender role(Coltrane, 2008; Kimmel, 2000).

Another agent that plays a part in gender socialization is mass media as it often portrays women as mothers or wives who tend not to have much significant roles, and when they assume a lead role at all, it is often too dramatic They could be a saint-like, malevolent or hypersexual(Etaugh, 2004). This similar inequality can generally be found in children's movies (Smith 2008). Some studies reveal that three quarters of characters who star in 101 G-rated movies are male, there were only seven movies that are less gender biased with near equal ration of male and female characters (Smith, 2008).

The gender-based stereotype is also fueled by television commercials and other forms of advertising. Most of the ads that promote cooking, cleaning or childcare

products often target women (Davis, 1993). This is why it is quite unusual to see men in commercials for dishwasher or laundry detergent. In contrast, when leadership, intelligence or balanced psyches are involved in a role, you will not fail to see men playing one of those roles. Another thing that raises concern is how women are dehumanized with sexuality and violence in mainstream media especially in music videos (Kilbourne, 2000)

2.6.5 Gender Diversity

A group of people who have diversity in their gender or called "LGBT" which stand for Lesbian Gay Bisexual and Transgender, the meanings are:

"Lesbian" refers to women who have attracted by same sex and have emotional attach with women.

"Gay" refers to men who have emotional attach with men and attracted by same sex.

"Bisexual" refers to male or female who are attracted with same sex and opposite sex.

"Transgender" refers to individuals who tend to be or behave as opposite to biological sex.

Male homosexual means men who have emotional attach to men or have sexual activities or sexual intercourse with men, somehow those of them are called "gay" which divided into three types including a.) Active Homosexual; the one who act actively as men when having sexual activities b.) Passive Homosexual; the one who act passively act when having sexual activities c.) Mixed; the one who either act actively or passively when having sexual activities.

It has been debating among researchers who work with people who are gender diverse during these days what are the factors that attributed to change their gender at last sooner or later. There are several theories describe the reasons why individuals develop gender as homosexual.

2.6.6 Factors attributed homosexual behaviors

Genetic cause

There are many studies have conducted to explain why individuals develop different gender from their biological sex. In the U.S., there were two studies have conducted among twins which found that 50% of identical twins and 24% of fraternal twins are both gays. It means that genetic could possibly influence how individuals to be homosexual.

The evidence of being gays among relatives was studied by Dean Hamer and staffs from National Cancer Institute, National Institutes of Maryland in 1993. The results of this study revealed that 13.5% of gays who have brothers who are also gays and 7.3% of their mother's brothers are gay. It is believed that gay gene is in chromosome X particularly from mother.

The evidence that related to genetic code Xq28 DNA markers has been studied by Dean Hamer and found that gay gene is in the long arm of X chromosome at Xq28.To sum up from this study, gay could be transferred genetically particularly from mother's genes.

Hormone level cause

An endocrinologist, Gunter Dorner proposed the stress theory could affect fetus in mother's womb not to be straight to their biological sex. During pregnancy, stress crisis could trigger hormone level especially testosterone which is male hormone to be lower than normal level. At the same time of fetus is in the stage of brain development and testosterone is suppressed. Eventually, this male fetus's brain will finally change to develop as same as female's brain. Therefore, if the boys grow up, those of them are more likely to be homosexual (Dorner, 1980).

Psychosocial causes

According to Sigmoid Freud's theory, it is reasonably to explain an idea of homosexual behaviors as the results of "Repression" and "Fixation" which found during child development especially aged 3-5 years (Phallic stage or oedipal period).

It is also believed that people who are narcissi tend to have deviation of sex behaviors. The explanation is those of whom are self-obsessed would probably be satisfied on people who are the same. Therefore, it is resulting in loving people who have the same sex.

Family causes

Many reasons related to family can explain how children grow up to be in the opposite sex to their biological sex. It is obviously seen that parental styles have effects on children behaviors. The parenting style of receiving protection from mothers instead of fathers can cause children don't trust their fathers and get closer to mother than fathers, children whom are raised in this kind of situations would have behaviors not according to their biological sex. Children who grow up in broken families also tend to have problems with behave according to their biological sex.

Nowadays, there are even more complex and diversity on how children are raised. One of the factors is issue related to same sex marriage in some countries. Moreover, those of them usually adopt children in to their families. However, there are still not clear on those children's gender, sexual orientation and sexual behaviors what are causes and consequences of these issues. There is a study on causes and consequences of homosexuality relevance for family law policies. In 2007, Lynn D. Wardle has published his journal in the title of "The Biological Causes and Consequences of homosexual Behavioral and Their Relevance for Family Law Policies". The study was actually intended to figure out family laws policies regarding the relationship of homosexual people who want same sex marriage. Therefore, the study focused on the health risks of engaging in homosexual behavior that related to a number of family law and policy issues: the legal recognition of same-sex marriage, domestic violence adoption and foster care. One of interesting results from the study is

about parenting concerns in adoption, custody, visitation and guardianship of children among same-sex marriage families. The study found that foster parenting by same-sex couples can influence ongoing homosexual practices. Parents with histories of deprivation, abuse, and poor parenting are normally inadequately prepared to care for their own children. This can possibly say that children who resided in difficulty circumstances, lacking social supports and deprivation of sexual behaviors will show problematic interactions towards those situations.

Types of men who have sex with men according to life-styles.

Homosexual men normally have different life-styles which can be justify by several factors including activities, interests, and opinions. According to factors analysis, researchers from Chulalongkorn University identified types of men who have sex with men based on life-styles in to six categories.

1. Homey Gay Lifestyle: This group of MSM normally loves staying at home, doing house-shores, cooking, gardening, and some of them might participate in religious activities.

2. Night Going Gay Lifestyle: This group of people love going out at night, partying, using illegal drugs, having multiple sex partners. This type of people usually thinks that using drugs is the relaxing way for them as well as gossiping.

3. Obviously Gay Life style: It is a life style of men who disclose themselves to society that they are not straight, they love same sex, they are into same sex and they prefer having sex activities with male. This type of people, somehow, dresses like women and concern about their appearance. They are more likely to have multiple sex partners and choose to date with good looking men.

4. Trendy Gay Lifestyle: This is a style of homosexual men people who determine to success in their lives. They like to learn new things, technologies, open-minded to accept new technologies and have high self-confident. Sometimes we will find this type of people usually is up-to-dated in terms of technologies and gadgets. Even though they

seem to have high self-confident, they have strong support group who have the same interests as them.

5. Conservative Gay Lifestyle: This type of MSM normally spends their live with carefulness in any detail of their lives for example they have good intentions to save money, concern about exercise, care about their appearances, and avoid unhealthy diet taking. Not only living their lives carefully but also seeking for creative leisure activities such as traveling, trekking, or activities related traveling.

6. Healthy gay Lifestyle: staying fit is the main reason to focus on for this type of people. Whatever they can do to keep healthy, they do. For example, they tend to keep on exercising, avoiding junk food, dressing up neatly, and enjoy traveling.

While to classify the gender of homosexual, there were any other ways to define them. For homosexual generally, Role of sex positioning was used to classify type of homosexual for easy understanding. Generally, sexual practices are sexual activities. In this study, to be more specific, sexual practices are focused among men who have sex with men which called “Gay sexual practices”; sexual activities involving men who have sex with men regardless of their sexual orientation or sexual identity. Sexual identity is how one thinks of oneself in terms of to whom one is romantically or sexually attracted. Sexual identity has been described as a component of an individual’s identity that reflects their sexual self-concept. The integration of the respective identity components (e.g. moral, religious, ethnic, occupational) into a greater overall identity is essential to the process of developing the multi-dimensional construct of identity. Sexual identity can change throughout an individual’s life, and may or may not align with biological sex, sexual behavior or actual sexual orientation(Rosario, 2006; Ross, 2003; K. Sinclair, 2013). Sexual identity is more closely related to sexual behavior than sexual orientation is. “Development of self-identification as homosexual or gay is a psychosocial and socially complex state, something which, in this society, is achieved only overtime, often with considerable personal struggle and self-doubt, not to mention social discomfort. (Laumann, 1994)

2.6.7 The meaning of Men Who Have Sex with Men

World Health Organization put the term homosexual in International Classification of Disease Ninth Revision (ICD-9) as well as in ICD-10 which is categorized in to Factors influencing health status and contact with health services and in sub-classification of high risk homosexual behaviors. The International Classification of Diseases (ICD) is the system for describing and coding mortality and morbidity incidents, implemented by most WHO member states. As of Oct 1, 2015, the USA formally transitioned to the updated codes, although they have already been in use in 117 other WHO member states. Since the reforms will probably add a substantial burden of cost to medical practices and physicians, are administratively disruptive, and offer no benefits to patient experience.

Oxford dictionaries defined the meaning of men who have sex with men as Men, including those who do not identify themselves as homosexual or bisexual, who engage in sexual activity with other men. Normally use in the context of public health and not include men who identify as heterosexual(Press, 2017).

Men who have sex with men is the term described males who engage in sexual activity with the same sex regardless of how individuals identify themselves; some may identify themselves as gay, homosexual, or bisexual.

The term “men who have sex with men” was created in the early 1990s while spreading of the disease through male-male sexual activity by epidemiologists as a surveillance tool to identify the route of HIV transmission.

2.7 Theory of Planned Behavior

One theory that the author believes can be used to explain how the MSMs start developing their risky behavior is the theory of planned behavior (TPB). The following section provides introduction to this theory.

The theory of planned behavior is a concept that explains how a person’s behavior can be influenced by several factors across three primary stages by which the final outcome or the decision can be predicted. The theory has achieved widespread recognition as a predictor of human behavior particularly in the studies of risky behavior among adolescents (Ajzen, 1991).

Generally speaking, the theory is composed of three constructs

1. Behavioral attitude.
2. Subjective norm
3. Perceived behavioral control

The process usually begins with individuals developing a behavioral attitude by making their own judgment about a certain behavior to which they happen to expose themselves either actively or passively. At this point, the attitudes they formed can be divided into affective and instrumental attitudes. The former is whether or not they find that behavior to be enjoyable, while the latter is the extent to which they find such behavior to be beneficial. (Ferdous, 2010). After having made their personal judgment, the individuals will be influenced by subjective norm which essentially is a group of people with whom they socialize. This could be but not limited to their significant others such as peers and family members or some unknown social media users. Similar to behavioral attitude, subjective is divided into two different types. One is the injunctive norm which is a group of people who encourage or motivate the engagement in a certain behavior. The other one is descriptive norm, which is the experience of those people having engaged in their behavior (Wang, 2014). In the final stage, perceived behavioral control then comes into play. In this stage, the consumer starts examining himself or herself to see whether he or she has the ability to overcome potential barriers and challenges posed by the desired behavior (Dahiya, 2015). In other words, if a consumer has a positive attitude towards certain behavior, receives support from others, and feels in control or capable of executing that behavior, he or she will have stronger intention and be more likely to engage in the behavior or in case of marketing make a decision to buy a product or service.

When applying TPB with case studies reviewed from relevant literature, it can be described that during the first stage, an MSM who exposes himself to user-generated sexually-related content on social media begins to develop a positive attitude towards some questionable activities such as searching for a sleeping partner, engaging in a sexual orgy or even using drugs. The increasing exposure will eventually result in him finding such activities interesting and enjoyable. However, the gay man may not yet have enough courage to participate in the said activities, but since social media is a

platform that allows users to interact with one another, the gay man could have his courage boosted when coming to have an interaction with other individuals with common interest, which sets the second stage in motion. According to TPB, the other individuals with whom the gay man has contact are considered Subjective Norm, which is basically another behavioral influencing factor. At this point, the MSM's attitude towards risky sexual activities or drug-related activities will be further shaped by received compliments and experience sharing, causing him to view them as something normal and no longer intimidating. This brings the MSM to the third stage as he will begin to explore his capability to participate with more risky and more extreme activities such as a shift from activities that maintain his anonymity to activities that increasingly reveal his identity.

Based on the arguments outlined, it is clear that social media have been present in every stage of the TPB. This is probably due to the fact that it provides the users, who in this case are the MSMs, an easy way to interact with others who are already engaging in risky behavior and be influenced to make a decision to participate in such risky behavior.

In fact, the impact that social media have on users' behavior is already heavily studied in business areas such as marketing. One of the common purposes is to identify factors that significantly influence consumers' tendency to make a purchase. In medical field, however, the use of social media is a gateway and a platform that can quickly lead a large number people to make a decision to participate in risky behavior. This is the reason why the researcher feels that an investigation on the pattern of social media usage among the MSMs is necessary.

Among many studies that have been carried out to examine the usage pattern of social media among the MSMs. The findings from(Young et al., 2013)on the relationships between online social network use, sexual risk behaviors and HIV zero-status among African American and Latino MSM suggested that HIV positive status was significantly associated with having a greater number of sexual partners met online(B:8.04, 95% CI:2.11-13.97) and HIV status is associated with sexual risk behaviors and social network sites used by MSM of color SNS users. Some studies

also suggested that African American and Latino MSM met new sexual partners to avoid stigma via using online technologies. Another study conducted among Black MSM who used social media to find sexual partners in three cities in the US during 2011 revealed that users of social media were more likely to engage in UAI compared to non-social media users (49.7% and 29.4%;*Chi square(1, N=205)=4.70,p<0.05).* However, when comparing the occurrences of high-risk sexual behavior between partners met online and offline, participants reported a lower percentage of unprotected AI acts with partners met online (Mean=9.71,SD=23.87,Mdn=0), compared with partners metoffline(Mean=20.40,SD=35.03,Mdn=0).

It is even easier to find sex partners when dating applications especially for MSM are available. GRINDR is one of the popular dating applications among MSM in the U.S. and in the other countries around the world. A study in the U.S. conducted among active GRINDR users in Los Angeles reported that 67.2 percent of the total participants used GRINDR to find dating, 62.1 percent of the total also used the application to find one-on-one sex, 17.1 percent used the application for seeking group sex and only 5.9 percent using the application for phone sex. The frequency of logging in the application was at least once a day and the frequency of sexual partnering via GRINDR that was reported by participants(45.3%) was less often than once a week. In Thailand, there are many dating mobile applications for MSM nowadays. The five most popular ones are Hornet, GRINDR, Blued, Jack'd and Tinder. This is not to mention other platforms such as Facebook and Twitter that the MSM are using to seek drugs and sex.

According to a cohort study that investigated the use of the internet among the MSM in Bangkok between 2006 and 2014, it was found that 71.4% of the total number of participants used the internet as a venue for seeking sex partners; 50.9% had received a request on the internet to join a high party; 18.1% have an experience joining a high party, and 14.1% have an experience joining a high party with men met via the internet.

Based on the obtained information about the use of social media among the MSM, it was found that seeking a sleeping partner is the primary purpose. The

following section will outline some of the most common dating applications and other social media platforms that are used by gay men to seek sleeping partners**.**

2.8 Concepts and Theories related social media use

Ever since the emergence of digital communication platform, there have been a large number of internet-based applications which evolved from the World Wide Web to what is currently known as the social media. This evolution has spawned many different definitions of social media. In effort to clarify, Carr and Hayes (2015), have set out to conduct a study to draw a precise definition of social media so that all the different types of social media can be distinguished from one another(Celeb T. Carr&Rebecca A. Hayes, 2015). This is important because the lack of a precise and common definition could result in multiple connotations of a concept, which can be problematic for researchers it. Therefore, the new definition of social media is defined as Internet-based, disentranced and persistent channels of mass personal communication facilitating perceptions of interactions among users, delivering value primarily from user-generated content which can be more precise as:

"*Social media are Internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-generated content and the perception of interaction"*

The following definition had been around for quite some time before the new definition of social media was coined in 2015. In 2008, Russo, Watkins, Kelly, and Chan defined social media as "Those that facilitate online communication, networking, and/or collaboration"(Russo, 2008). In 2010, Kaplan and Haenlein (Kaplan, 2010) gave a brief definition of social media as "a group of internet-based applications that build on the ideological and technological foundations of web 2.0, and that allow the creation and exchange of user-generated content". In the same year, Lewis (Lewis, 2010) also came to propose a short definition of social media as "a label of digital technologies that allow people to connect, interact, produce and share content. Kent (Kent, 2013) also defined it as any interactive communication channels characteristics that allows for two ways-communication or interaction which identified by directional message

further specifying modern social media are characterized by their potential for real-time interaction, reduced anonymity, a sense of propinquity, short response times, and the ability to time shift, or engage the social network whenever suits each particular member. After a few years, researchers attempted to offer the definitions. In 2012, Howards & Parks(Howard, 2012) identified social media as digital technologies which are platforms or channels using specific tools like Facebook or Twitter to exemplify modes of interaction as well as giving more social media a more complex definition. Social media as Howard and Park defined in 2012 consist of three parts: a.) The information infrastructure and tools used to produce and distribute content, b.) The content that takes the digital form of personal messages, news, organizations and industries that produce and consume digital content, c.) The people, organizations and industries that produce and consume digital content.

Therefore, the definition of social media in this study is digital technologies which has undergone based on web 2.0 in order to facilitate communication, interaction, production and sharing digital content ; personal message, news, and stories by users who are people, organizations, or industries in either real-time or asynchronously to broad and narrow audiences.

Social Network Sites: A definition

Social network sites as defined as web-based services that allow individuals to

a.) Construct a public or semi-public profile within a bounded system, b.) Articulate a list of other users with whom they share a connection, c.) View and traverse their list of connections and those made by others within the system.

"*Networking*" emphasizes relationship initiation, often between strangers. Enabling users to articulate and make visible their social networks makes social network sites unique. This can result in connection between individuals that would not otherwise be made, but this is often not the goal, and these meetings are frequently between "latent ties" who share some offline connection (Haythornthwaite C., 2011).On many of the large SNSs, participants are not necessary to look to meet

new people; instead, they are primarily communicating with people who are already a part of their extended social network.

With a rapid increase in the popularity of handheld devices, numerous applications that once used to run on a desktop computer have been developed to function on smartphones. This shift towards a wireless norm of communication has eliminated the limitations of space and made many software applications much easier for people to access while on the move. Among the endless list of smart phone applications that have become part of everyday routines are social media applications. This type of applications enables users to create and share their content from simple text to motion pictures. Many software companies have been trying to develop their applications to specifically satisfy various needs of the clients. However, for the purpose of this study the focus will be on smartphone applications designed for general content sharing and dating purposes.

Facebook is an application for general purpose that permits emotional bonding to be created among the users(Ahmed W., 2016). The app is considered quite an achievement for the software developers since the emotional impact that Facebook has on the users is astounding. For example, its 'like' feature can emotionally affects users making feel recognized and connected to other users. Because of this, Facebook has grown to become a dominating channel of web-based communication with the highest rate of engagement. Like other social media apps, Facebook allows content sharing in the form of texts, pictures, video clips and live streaming. If preferred, the users can also activate location sharing to let other users know their whereabouts. The content they create and share will be interacted with by other users who post feedback comments or express their like or dislike. Facebook users have a variety of choices over various modes of communication, which also depends on their desired level of privacy. For example, they can post videos or texts on their own page for anyone or a specific group of people to see. If they want total privacy, they can open a chat room to talk directly with a friend in their Facebook list. Moreover, Facebook users can form a private group where only members with specific common interests are invited. Facebook is also free and user-friendly. It can be downloaded and installed almost

instantly with a few taps on the screen. All of these explain why Facebook is the most connected online society with the highest rate of user engagement.

Twitter is another choice for online communication. The ability to spread information quickly is one of its most cited advantages. Twitter was developed in 2006 to be used as a platform for friends and family members to stay connected with quick and simple exchange of information(Hillel Fuld, 2013). Because of this, Twitter users tend to be individuals who like to stay tuned and receive the most recent news updates. To facilitate such quick information exchange, the app was designed to accommodate up to 140 letters for a single tweet, which is an act of content-sharing. Every message tweeted can be viewed by the content generator and other users of the application. In 2007, Hashtag was invented to categorize conversations to help users identify their topic of interest. It can take any name as desired by the content generator who wants to signpost the passersby of an ongoing conversation thus making their communities more reachable. Twitters users can also subscribe to the channel of their favorite celebrities or influencers to receive news updates as notification messages will automatically appear on their screen every time new content is generated. Likewise, the Twitter users can also have their own followers if the content they create is interesting to the other parties(Elaisha Green, 2018; Hillel Fuld, 2013).

When users click or tap on the 'like' button or share particular content on most social media apps, generators of the content will be instantly notified, allowing them to know that their work has been appreciated. Moreover, an acting of re-sharing content is a powerful feature of Twitter to spread information to a vast number of users worldwide over a short period of time. Another interesting feature equipped in this app is 'Direct message' which enables users to have a private conversation similar to what is available on Facebook except that the length of each message is limited to 140 letters(Elaisha Green, 2018).

Hornet is one of the most used dating applications among the MSMs. The application developer claims that it has reached 25 million users worldwide. Since its conception, Hornet has consistently been improved and its latest version, Hornet 4.0, is more than just a dating application. Hornet users can now receive updates about gay

events and recommendations about places to visit worldwide. Despite all the new improvements, Hornet's main feature remains intact. Once creating an account, users can start posting their images and searching for a partner who happens to be in close proximity or in another country(DatingAppsAdvice, 2018; Hornet Networks LTD., 2019).

Hornet is very easy to use. The users will first have to go through registration process where their username, password, birth date, age and e-mail address are required before they can begin posting their profile pictures. Hornet is also distinguishable from other dating apps with features such as discover and activity feed(Matt Keeley, 2016).

Discover is a feature that allows users to search for potential partners with similar interests easily without the need to tap or scroll down on profiles. Activity feed was also an interesting feature that informs users when new Hornet members join the community or when some other users change their profile pictures. The developer of this feature said that he wanted the app to be more than just sex seeking(Matt Keeley, 2016).

Hornet also sports a 'follow' feature found in mainstream social media apps such as Twitter and Instragam. With this capability, Hornet users can now be notified when their favorite followees post something. Other than that, Hornet also allows its users to be open about their HIV status through feature called KYS or 'Know your status at their free will(Hornet Networks LTD., 2019).

Blued is a dating application originating in China, this application has won recognition not only in China but also internationally. Currently, Blued has been used by more than 27 million MSMs worldwide(Blued International Inc., 2019). This application also features multiple language user interfaces and the latest update has equipped this application with live video streaming. Moreover, the users also earn points from participating in certain activities to spend on gifts. Apparently, the application developers are working tirelessly to introduce new interesting features that enable more engagement and interactions. This dating application is not fundamentally different from the others. Users can scan for potential friends with similar interests in

the nearby areas. They can either create a group that enables one-to-many communication or open a chat room to speak with someone in private. What seems to set this app apart from its rivalries is live video streaming. This function allows users to broadcast themselves which can be viewed by anyone who happens to be in the nearby areas or invited by the broadcaster. However, Blued is slightly different from the rest because it does not have the 'like' feature to give feedbacks to other users for the content they create. However, if users wish to leave a feedback, they can do so by joining public or private video streaming. Apart from that, Blued introduces its own crypto currency called Beans which can be purchased with real money. The users can spend beans on virtual gifts to send to other users. The act of giving and receiving gift also shows your social wealth. Users will earn 1 wealth point for every 100 beans they spend. As their wealth status increases, they will earn some privileges to allow them to be more attractive than other users(Blued International Inc., 2019; DatingScout, 2019).

Line was developed specifically for one-to-one conversation, but the app allows users to create groups where member with common interest are invited to share content. Line users can send texts, stickers and emoticons to other users who operate the application on any devices. There are also several features that make Line a useful marketing tool. For example, the users can create their own account page and directly unload their content(Elissa Loi, 2016; LINE Corporation, 2018).

Instragram is a photo-sharing social media app. The concept of this app revolves around the idea of finding people with similar interests through photo sharing. There are four different methods to find photos of interest with each one of them having its unique advantage. The first method is to view pictures posted by people whom you follow on Instragram on the menu 'Home'. The second method is through the function 'Popular' where photos with the most number of likes are presented. The third method is the use of function 'News' which allows users to find and give feedbacks to pictures they like by liking or commenting. The forth method is through the use of Hashtags, which have already been added to pictures' captions. Users can search for images of their interest by preceding their search terms with a hashtag. Instragram users can follow content creators whom they like in a similar way to Twitter. Moreover,

Instragrams users can use their account to login to Facebook which saves a lot of time on registration(Jon Mitchell, 2012).

Grindr is a dating application. The app is available in free and paid versions. Like Hornet and Blued, it utilizes mobile geolocation to locate other nearby users. Users can see images of other users on a grid. When tapping on the image, users can activate a chat with the person. Grindr is also one of the most popular dating applications, and it is believed that the more users a certain application has, the easier it is to find a match(Dating Sites Reviews, 2018). In 2017, a survey shows that Grindr had 27 million users across 196 countries worldwide with more than 3 million daily active users(Dating Sites Reviews, 2019). **Grindr XTRA** is the premium version of the app that does not spoil users with advertisements(Grindr, 2018). Users can personalize their push notifications, follow up to 600 people, and swipe through profiles. Grindr is choice for gay, transgender, bisexual and queer people who wish to find the best match. In 2018, Grindr has developed a function to fight the spread of HIV, by reminding the users to receive HIV blood test, which shows the developer's sense of responsibility for health care.

Jack'd was developed to help its users find new friends. One of its key features is multiple profile photos that allow users to show their authentic selves. Jack'd is differs from other mobile geolocation-based apps in that it lets users specify the destination where they want to find friends prior to their arrival. Jack'd also sports a filter function that let users narrow their search to find people who meet their criteria(Jack'D, 2017).

Utilized applications among Men Who have sex with Men in Thailand

The popularity of social media application among men who have sex with men in Thailand has attracted attention from those who work on both behavioral medicine and science medicine, but the most prominent researchers, who have recently been active in this field, are perhaps Boonchutima and Sriwattana(Boonchutima S. and Sriwattana S., 2016). In 2015, they approached gay-dating applications users via three online platforms, namely: Pantip, Palm Plaza's web board, and closed Facebook groups of gay people. Consequently, they found that during 2015, application named " Jack'D"

was reported to have the highest number of users (53.2%), followed by Grindr (47.3%) and Facebook (40.1%). The study also revealed that the average time spent on each application after every log-in was approximately 20 minutes or longer. Also, the time most of the users were usually active was between 9.00 pm and 12.00 pm., and the number of app users would reach its peak on Friday and Sunday night. It was also found that the MSM's use of applications normally took place at home, but other venues that saw their online activities also include mall, restaurant. In terms of information disclosure from the study, gay-app users are most likely to reveal themselves by using their real photo with a clear view of the face (80.1%), providing real nickname (63.6%), and providing Line ID (58.4%)(Boonchutima S. and Sriwattana S., 2016; Boonchutima S., 2017).

Emerging issue: Internet use

The emerging issue among this group is an advance in technology. It is undeniable that technology like smartphone allows us to have a convenient life-style. People have an easier access to information and enjoy interacting with other people in the cyber world. While it is true that social media could benefit young people in a number of ways, be it enhancing communication or building social connection and technical skills (O'Keeffe, 2011) but at the same time it lends itself as a platform that allows users to be exposed to risky behavior and to see other people's reaction and attitudes towards such behavior. Besides, it can be a source of information for some teenagers to learn tricks or methods to engage in risky behavior or obtain illegal items such as drug and alcohol. With that being said, teenagers who lack self-regulation and have susceptibility to peer pressure could put themselves at risk. The first kind of risk they may put themselves into concerns privacy. For example, while navigating through the cyber world, teenagers may be doing unwise things such as posting false information about themselves or others(O'Keeffe, 2011). It is also important to note that given the advancement of handheld electronic devices, social media today has the ability to bypass parental monitoring, which an important defensive line is preventing adolescents from risk behavior, and enable peer pressure to negatively influence how young people use social media especially when they are alone in their room.

There is no doubt that peer pressure has long been a major influence for teenagers and is associated with many kinds of risky behavior but with the emergence of social media, the influence of peer pressure becomes even much stronger. Many social media platforms and cellular settings today are making it possible for sexually-active adolescents to participate in dating and sexual activities (Gebremeskel RH., 2014).Griffith then notes that the Internet can (and has) been used for a number of diverse activities surrounding sexually motivated behavior. These include the use of the Internet for seeking out sexually-related materials for educational use, buying or selling sexually-related goods for further use offline, visiting and/or purchasing goods in online virtual sex shop, seeking out material for entertainment/masturbatory purposes for use online, seeking out sex therapists, seeking out sexual partners for an enduring relationship, seeking out sexual partners for a transitory relationship , seeking out individuals who then become victims of sexually-related Internet crime (online sexual harassment, cyberstalking) , engaging in and maintaining online relationships via email and/or chat rooms ,exploring gender and identity roles by swapping gender or creating other personas and forming online relationships(Griffith M., 2004).

Today, there is a myriad of risky behaviors that would not have been possible without the existence of social media such as cyber bullying, sexting, the sharing of embarrassing photos, and the spread of dangerous pranks and stunts (Branley B.D., 2017). The predictors of willingness to engage in these risky behaviors are believed to be attitude, injective norms, descriptive norms, and previous behaviors. A study conducted by Dawn Beverley Branley and Judith Covey(Branley B.D., 2017) suggests that the exposure to online content that contains risky behavior could increase the possibility of the users engaging in their own risky behavior including drug use, excessive alcohol consumption, and disordered eating when they are off computer or mobile devices, and as far as sex-related risky behavior is concerned, the online exposure to such behavior could place the individual at risk of exchanging sexual content with strangers and even having unprotected sex with them. Interestingly, the aforementioned study seems to correspond with that conducted by Pujazon-zazik, M.,& Park, M.J.(Pujazon-zazik, 2010) whose findings reveal that the use of social media has the potential to exert the influence on risky behavior such as unprotected sex

and sex with strangers which take place in the real world. Moreover, the use of social media on handheld devices has been reported to be associated with risky sexual behavior. A study conducted by Landry M.(Megan Landry, 2017)to investigate a link between social media and sexual behavior among Latino adolescents aged 13-19 years show that 90% of the subjects use mobile phone, SMS and social network sites on their first visit and their sexual risk behavior score happened to increase with the number of activities on their phone.

Obviously, the Internet has been offering teenagers opportunities to explore the world of sexuality online. Some group of researchers such as Baumgartner, S.E., Valkenburg. ,P.M.,& Peter, J.(2010)(Buamgartner, 2010) were interested in how young people engage in sexual behavior on the Internet. They, therefore, conducted a study with an aim to investigate adolescents' risky sexual online behavior. In the end, they found that teenagers have been using the Internet for sexually-related activities such as finding someone to talk about sex or even to have sex. Some teenagers send intimate photos or videos to someone online which insinuate sexual interest, but what raises the biggest concern among parents is the exchange of intimate information to someone they know exclusively online because they could fall victim to sexual predators whose true identity could be hidden.

The relationship between social media use and risky behavior has been studied many researchers. Cox, A.D.,& Cox,D (Cox, 1998)are among those who came up with an interesting answer to this phenomenon. What they have discovered is that based on social learning theory individuals could internalize behavior through observational learning. In other words, they could imitate what they see. Moreover, if the individuals happen to see how a certain behavior they see is endorsed or reinforced by others, chances are that they will engage in that social behavior.

Moving on to the actual risk taking behavior that happens in real life, a study by Benjamin Lee (Lee B, 2009) looks at how some of the HIV-infected adolescents in Northern Thailand engage in sexual risky behavior. Disturbingly, they found out that more than 40% of them reported to have had sexual intercourse but only 16% and 11% of males and females reported to use condom every time they had sex. More than 80%

reported to have consumed alcohol, cigarette and drugs. When asked about their basic understanding of condom use, 77.8% said they knew it could prevent HIV transmission and their source of information is the Internet and friends.

However, using internet and social networks among men who have sex with men nowadays has been mainly involving seeking sexual partners. Those who used the internet to find sexual partners were more likely to engage in high risk sexual behaviors(Bolding, Davis, Hart, Sherr, & Elford, 2006). The study of H.Holtz Timothy et. Al. also reported recruiting MSM sexual partners from the internet was common with high risk behaviors. In Thailand, online social network and smartphone applications are one of the venues for MSM to engage in an orgy ("sex moo" , "moo kun" in Thai) .Announcement for seeking to join and recruit MSM to a sex party with or without getting high(i.e. recreational drugs) is also found on the internet(H.Holtz Timothy, 2014)

2.9 Related studies

Social Network and smartphone applications use among Men Who Have Sex with Men (MSM)

An array of smartphone applications (apps) are designed to help many people to find new relationship or friends. Particularly men who have sex with men, the applications including Facebook, Twitter, Grindr, FindFred, Growlr, Scruff, Hornest, Tinder, and many other applications allow them to find sex partners. Moreover, some of those applications are designed to let people find nearby potential sexual partners by displaying photos of users arranged from the closet to the farthest area, which significantly improve the chance of finding a sexual partner.

A study of Justin J. Lehmiller and Michael loerger has been conducted as an internet-based study to learn more about sex lives of MSM who meet sexual partners via smartphone applications and the results of the sexual health histories between applications user and non-application users are compared. A total of 252 persons among LGBT group had provided consents but only 112 individuals were included in the data analysis. The mean age was 29.97 with 86.2% of the participants being predominantly White, and 81.3% of the participants from the US. The results of the study suggest that

the vast majority (approximately 77%) reported having an account with Grindr. In terms of sexual behavior, the median of oral sex partners that they met through the apps was 4 (M=15.27, SD=30.61) and the median number of anal sex partners was 2(M=7.53, SD=15.57). One third of application users reported at least one of these sexual encounters had turned in to a romantic relationship. Application users (35%) were significantly more likely than non-users(14%) to have been diagnosed with at least on STI other than HIV *[χ^2(1,N=109)= 6.34, p= 0.012]* . Moreover, application users reported to have had more lifetime sex partners than the non-users *(U=680,p<0.001,r=0.47);* the median number of lifetime sexual partners of applications users was 30, compared to 7 (*Mean SD =85.92)*of the non-users.

The relationship between online social networking and sexual risk behaviors among Men who have sex with men (MSM)

A study of the relationship between online social networking and sexual risk behaviors among MSM conducted in The United States revealed a disproportionate number of incidents of HIV infection with an increasing rate of HIV infection found among the MSM. The participants were recruited online through the 92-item online survey, which takes approximately 45 minutes to complete. The data concerning sexual behaviors and internet use have been collected. A study of Young (Young et al., 2013) has found that 100% of participants were current Facebook users; 45.5% used my space and 44.6% used Twitter, with 18% of them being sex-seeking users. The participants identified themselves as gay (76.3%), bisexual (17.8%) and single (82.2%).

The majority of the participants had used the internet and online social networking technologies to meet new sex partners within the past 3 month; on average, they met over 4 of their most recent sex partners. The results from the analysis suggested that the MSM are using online social network for sex-seeking, and that meeting sexual partners form social network sites is associated with increased likelihood of engaging in sexual risk behaviors.

Men who have met sex partners via Internet

A study of Eric G. Benotsch et Al.(Eric G. Benotsch, 2002) has been conducted to assess the prevalence of internet use as means of meeting sexual partners where the participants are participants at gay pride festival in Atlanta. A self-questionnaire that aimed to measure mainly in Internet use, Gay acculturation , AIDS knowledge , condom attitudes, substances use and sexual practices. The results from a study showed that eighty-eight percent of participants were gay, 8% bisexual, and 4 % heterosexual. Four hundred and thirty men (73%) reported visiting gay-oriented web sites at least once. Two hundred and one (34%) reported having had sex with someone they initially met over the internet. Individuals meeting sexual partners online report more frequent use of gay-oriented internet sites chat rooms (M=3.12, SD 1.02). Those who met sexual partners online and offline have the same level of AIDS knowledge and attitudes toward condom use (M=15.56, SD =2.90), $t<1.0$, ns.

In the topic of substances use and meeting partners over the internet, there are no significant differences between the groups that use alcohol, cocaine, nitrite inhalants or marijuana. However, 16% (thirty-two) of men who meet sexual partners via the internet reported to have used Viagra to boost their sexuality. (χ^2 17.40, $p<0.01$).

In the aspect of sexual risk practices and meeting partners over the internet, men who meet sexual partners over the internet revealed to have had sex with more male partners in the previous 6months(M=8.38,SD =19.39).Participants who had met a sexual partner over the internet were more likely to have engaged in an unprotected anal intercourse in the previous 6 month(66%) relative to men who meet their partners offline(52%), χ^2 (1,N=557)=10.23,p=0.01. Therefore, it is possible to predict how men who have sex with men use internet to engage in sex seeking(Eric G.Benotsch, 2002).

Chapter III

Research Methodology

3.1 Research Design

A cross-sectional study was conducted to explore online social media use and sexual risk behaviors among Men Who Have Sex with Men in Bangkok, Thailand. The primary data was collected including socio-demographics data, experiences of dating application use, and risky sexual behaviors among online social media users. A self-administered questionnaire was used as a measurement tool. With open-end questions in the questionnaire, the information of social media use among participants was identified.

3.2 Study Area

According to the highest number of target population was in Bangkok, the study was conducted among those who are currently living in Bangkok and are receiving health care services from a research collaboration center and a reproductive health care clinic in Bangkok metropolitan.

3.3 Population and Target population

According to the incidence rate of the HIV infection among MSM in Bangkok was the highest top rank in Thailand a long with a collaboration of the organization and clinic that allowed author to be able to access their clients. Statistically, both research collaboration center and reproductive health care clinic have been working on providing health care services to risk population and people who are living with HIV for many years. Moreover, to be beneficial to clinic and organization, the results of the study could be data based for health care management holistically to individuals.

3.4 Sample size Calculation

The estimated proportion of HIV-infected MSM is calculated by simple formula (Daniel WW., 1999; L.Naing, 2006)where the percentage of men who have sex with men who use social media to find dates was 34% (with 95% confidence level and precision at 0.05(*d*))

$$n = \frac{Z^2\, p(1-p)}{d^2}$$

where n = sample size

Z= Z statistic for level of confidence

p= expected prevalence or proportion

d= precision (in proportion of one if 5%; *d*= 0.05)

Calculate:

Z = 1.96 (Z at 95% confidence level)

p = 0.34

d = 0.05

$$n = \frac{1.96^2(0.34)(1-0.34)}{0.05^2}$$

n = 344

At the beginning of the study, the number of potential participants was aimed to be 344 according to the sample size calculation with 95% of confidence level at the precision at 0.05(d). However, over six months of data collection the total participant was 201.Therefore, the sample size calculation was re-calculated as the following with the thirty-four percent of MSM using social media to seek for dates :

$$n = \frac{Z^2\, p(1-p)}{d^2}$$

$$201 = \frac{1.96^2(0.34)(1-0.34)}{d^2}$$

$$d = 0.065$$

Therefore, the number of total participants 201 with a re-calculation of sample size, the confidence level was adjusted and with the above calculation the precision was at 0.065.

To confirm that the number of participants of this study was acceptable to analyze the equation was reassure with a sample size calculation with the 93% confidence level with precision at 0.07;

$$n = \frac{1.47^2(0.34)(1-0.34)}{0.07^2}$$

$n = 98$

Hence, the cut off number of sample size with the 93% confidence level with the precision at 0.07 was at 98.

3.5 Sampling technique

A purposive random sampling was used to target the potential participants who are , Men who have sex with men aged 15 and over and currently receiving health care services at a research collaboration center and MSM who are currently receiving health care services from the reproductive health clinic. As well as the potential participants who were recommended to approach from the participants who enrolled into the study (Words of mouth).The participants were identified by using Patient Identification number and Initial name (the first latter of name and the first latter of surname). People who meet the inclusion criteria and have a schedule for visiting at the clinic were approached on that day. While some of participants were recruited via online platform from the recommendation of participants who enrolled to the study.

3.5.1 Inclusion and exclusion criteria

Inclusion Criteria

1. Male gender at birth who reported having sexual intercourse with same sex

2. Aged 15-60 years old

3. Able to understand and read Thai language and inform consent process

Exclusion Criteria

1. People who has serious illnesses both physical and mental

2. Disability

3. Those who are not able to comprehend the inform consent and the purpose of the study

3.5.2 Inform Consent Process

All of Participants were asked to provide the information anonymously. Additionally, those who are eligible to enroll in the study confirmed that they are men who have sex with men by self-report. In which the meaning to identify that those are men who have sex with men must follows the definition; those who remain as the same sex at birth but have at least once in a life-time experienced having sexual activities with the same sex. Of those who were physically approached the inform consent process was done on the same day of doing a questionnaire. Among participants who recruited online, the written consent was done online before the self- questionnaire was started. Among the participants who are age under 18, the parental consent was also obtained on the day of participating into the study. The parents or guardians of the potential participants were also provided pros and cons of the study and they have right to decide to participate into the study. The anonymous was ensured with identifying only the initial letter of their name and the initial letter of their surname with age. The PID was assigned to the participants in order to prevent the error.

3.6 Measurement tools

The questionnaire was created in the purpose of collecting both quantitative and qualitative information which consisted of 3 parts. The total number of questions was 46 which separately divided into two versions of questionnaire: HIV-positive and HIV-negative groups. Part 1 of the questionnaire, socio-demographic information was intended to capture. Part 2 of the questionnaire, Online Social media use and Risky Sexual Behaviors were determined. In this section, the questionnaire consisted of closed-end questions and open-end questions. Part 3 of the questionnaire, Sexual Behavior and Health behavior in general was captured. Again, in this part of questionnaire both closed-end questions and open-end questions were used to capture the data.

A Likert's scale was applied in part 2 where respondents have to answer how frequent of them practicing such risky sexual behaviors with whom they meet from online social media platforms.

Table1. The summary of questions presented in the questionnaire

Part	Quantity of questions	Scale used
PART1: Socio-demographic information	6	Open-end
PART2: Online Social Media Use and Risky Sexual Behaviors • Online Social Media Use • Risky Sexual Behaviors among online users	 10 15	 Open-end Nominal and Likert's Scale
PART3: Health Behavior • AUDIT	4 10	Nominal Ordinal
Total Number of the Questions	45	

Part 1 Socio-demographics data

Socio-demographics data consisted of 6 items including age, gender, highest education, occupation and income per month were asked to fill in the gap with open-end question. According to the data from respondents, the variables were identified scale and type of scale for data processing as in the following table.

Table2. The summary of Socio-demographics data

Variables	**Scale**	**Type of Scale**
Age	15-24 years old 25-34 years old 35-60 years old	Ordinal Scale
Gender	Homosexual • Gay King (Insertive ,Topping) • Gay Queen (Receptive,Bottoming) • Both	Nominal Scale

	Bisexual Others	
Highest Educational Level	Primary School Junior high School Senior high School Bachelor's Degree Master Degree Doctoral Degree	Ordinal Scale
Variables	**Scale**	**Type of Scale**
Occupation	Student Freelancer Self-employed Company employee Civil servant Business owner Unemployed	Nominal Scale
Monthly Income	No income ≤ 10,000 THB 10,001-20,000 THB 20,001-30,000 THB 30,001-40,000 THB ≥ 40,000 THB	Ordinal Scale
Extra income per month	Yes No	Nominal Scale

Part 2 Online social media use

Pattern of online social media use in the purpose of finding sex partners was investigated in this part. The participants were screened by being asked “have ever used online social media in the purpose of finding sleeping partners”. If those of whom have been using only for general purpose for example keeping in touch with friends or other reasons, they skipped to part 3 which is sexual risk behaviors in general. Of those who are responded “yes” to the question, they were asked the last time of using online social media for finding sleeping partners in the last one year. Participants were asked to provide the number of online social media that they were currently using. The participants also ranked the most to the least from 1 to 5 along with the reason of using. Participants were asked whether or not they have ever got sleeping partners from the first ranked social media application and participant were asked to indicate an estimated number of sleeping partners that they have had from online social media site that they used most of the time. Types of sleeping partners were identified in to casual sex partners and/or one night stand sex partners, commercial sex partners or sex partners who exchange for money or goods, regular sex partners who they are not in a serious relationship but seeing for sex purpose more than one time. Risky sexual behaviors through online social media use were also investigated in this part by collecting from online social media site they utilized the most as main venue to engage in risky sexual behaviors accordingly to the main variables; condom use, alcohol use, and recreational drugs use related with sex activities and joined sex parties.

Patterns of online social media were investigated in detailed by using the open-end questions. The participants were asked how are they using in each particular online social media site, how did they create their profiles at the beginning, duration of using each online social media sites from first time match till agreeing to have sex activities in each particular sex partner that they have got form each site. What kind of conversation or specific word choices that they use in order to indicate that they are interested in each person, kinds of pictures or video clips that they normally upload and how do they use the function of video call real time.

Part 3 Health Behaviors

Health behaviors, in the last part, are directly involved with how normally they take care of themselves. Starting from alcohol use, among participants, if those who responded have used alcohol in the last one year, an Alcohol Use Disorder Identification Test was applied in order to evaluate and screen whether their daily lives are impact from drinking alcohol or not.

A standard test, Alcohol Use Disorder Identification Test (AUDIT) in a short version is used in this part of questionnaire.

The Reliability and Validity of Alcohol Use Disorder Identification Test

The results of reliability test of The Alcohol Use Disorder Identification from research revealed internal consistency which indicated high level of reliability, test-retest reliability is also done to reveal the reliability which found r = 0.86 (Fleming, 1991; Hays, 1995; M. Sinclair, McRee, B. and Babor, T.F., 1992).A study in The United States which also found high reliability was conducted among the various sample groups including alcohol users and drug users. There are several studies have conducted to find validity and reliability of the tool in different samples and clinical units. The most favorable sensitivity is recommended by finding the cut-off point at the score of 8, in some studies that found lower cut-off point still showed an acceptable result (Allen, 1997; Cherpitel, 1995; Conigrave, 1995). It has been found that the AUDIT can provide the good discrimination in a variety of setting where populations are encountered for example in primary care units (Piccinelli, 1997), emergency room (Cherpitel, 1995), community(Allen, 1997) and university (Fleming, 1991). A recent systemic review study has concluded that the AUDIT is the best instrument for the whole range of alcohol problems in primary care, as compared to other questionnaires such as CAGE and MAST. Its reliability and validity not only published in a variety of setting but also it has been translated in to many languages including Thai language.

In Thailand, Ministry of Public Health and World Health Organization has collaborated in ordered to translated, published and promoted to use the AUDIT since 1989. The AUDIT has been used as a primary screening tool in many clinical units

especially primary care units. Since then Thailand has worked on the problem of alcohol disorder use among population with updated version of the AUDIT. However, in this study AUDIT question will also be tried out before using in the targeted population

Of those who have current couple or in serious relationship, the questions related their couple will be asked for example how much they practice safe sex with their partners.

Of those HIV-negative participants, receive HIV testing and health prevention from HIV infection were captured. Among HIV-positive participants, in this part, medical adherence was determined to see how they adhere to treatment.

Validity and Reliability of measurement tool

The pilot study was conducted prior to collect the data from target population which the result from pilot study was used to test reliability of the questionnaire. The pilot study was conducted among 10 respondents who identified themselves as homosexual, receiving health care services from SEARCH research center under the anonymous clinic and willing to provide information with inform consent process was conducted. The reliability was tested among the closed-end questions by using SPSS version 22 .Cronbach's alpha was used to measure the reliability or internal consistency which the tool is ensured how well the tool should be. Cronbach's alpha tests to see if multiple-questions likert scale or dichotomous – questions surveys are reliable(Stephanie, 2014). In this study, 10 questions that are likert scale and dichotomous –questions were tested to see the reliability. In order to interpret the Cronbach's alpha value, the rule of thumb is illustrated as the following table.

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Reference: (Stephanie, 2014)

According to the table of interpret the Cronbach's alpha in the above table, the Cronbach's alpha value from this study was 0.77 which shows that the measurement tool using in this study is acceptable.

3.8 Data collection

-Men who have sex with men who are currently receiving health care services from the clinic were recruited in the process of data collection. The total number of interviewers was 3. The session of training how to use the questionnaire was done before the day that first participants join in to the study.

-The participants who meet the criteria were asked to join into the study on the day of clinic visiting.

-The participants who were willing to participate into the study were provided a private room to answer the questionnaire.Of those who were available for interview, the private rooms were provided during the session to avoid bias, data contamination and keep the information confidential.

-The respondents took at least 15 minutes to complete the questions.

-Face-to-face interview with semi-structure questionnaire were used to collect the information from the participants who were willingly to provide more information in detailed in qualitative part.

-During the session of interview, participants were asked for permission for a voice record.

Procedure

-The participants were approached on the day that they came to visit clinic as a regular checkup.

-After participants finished all the process of receiving regular health care services they were asked willingly to join the study.

-The inform consent process was conducted before the process begins. The information form that contains all information about the study was provided to participants. During inform consent process was conducting, participants could ask any questions if they wanted and they were allowed to refuse to participate into the study if they feel uncomfortable to answer the questions. Inform consent was required to be completed before data collection. To be noted that, participants who are younger than 18 years old are required a parental consent to participate into the study. The assent form was provided to participants and the consent form was provided to parents or care providers separately.

-After inform consent process was finished, participants were asked for a permission to access their medical records.

-Interview started from the first part thoroughly to the third part, they were asked to answer the questions by face-to-face interview both quantitative data and in the part of open-ended questions. The total number of questions is 35 questions. With a consideration of patient's right, they have right to refuse answering questions in the questionnaire if they feel uncomfortable to response.

3.9 Data Analysis

SPSS version 22.0 is applied to analyze the data. Descriptive data analysis was deployed in order to present the data. A cross-tabulation with Chi-square test was used to display the information. Fundamental qualitative descriptions, content analysis were used to explore how pattern of social media use among the participants. Logistic Regression was deployed to test the probability of social media use and risky sexual behaviors among the participants.

3.10 Ethical Consideration

The Ethical committee from Faculty of Medicine, Chulalongkorn University was approved by Full board committee on May 31, 2018 with the regulatory no. 141/61.

Chapter IV

Data Analysis and Data interpretation

The participants were recruited from three venues from clinics; The research collaboration center and a reproductive health care clinic and from online venue. The total number of participants is 201 which including both HIV positive and HIV negative MSM who are willing to participate into the study. The study was conducted after the approval of Ethical Committee under The Faculty of Medicine, Chulalongkorn university between June to Dec,2018. The total number of HIV-infected MSM was 71 and the total of HIV- noninfected was 130. The inform consent process was conducted among MSM while the consent was provided along with the information to confirm the confidentiality among HIV-negative group who were recruited and did self-administered questionnaire online before allowing them to access the first session of the questionnaire. HIV negative MSM who were recruited via online with purposive sampling and the questionnaire were distributed via word of mouth of participants who joined into the study.

4.1 Socio-demographic information

Socio-demographic findings were revealed in the following summary table which included *age, gender, occupations, highest level of education, monthly income and extra income.* Each independent variable was presented in a cross-comparison table which displays outcomes between HIV-positive participants and HIV-negative participants.

Table 1 the summary of socio-demographic information comparing between HIV-positive and HIV negative participants

Socio-demographic independent variables	HIV-positive (N=71)			*p-value*	HIV-negative (N=130)			*p-value*
	Never used	Ever used	Total		Never used	Ever used	Total	
	%(n)	%(n)	%(n)		%(n)	%(n)	%(n)	
Age								
Age 15 - 24 years old	0	19.7(14)	19.7(14)		19.2(25)	25.4(33)	44.6(58)	
Age 25 - 34 years old	1.4(1)	32.4(23)	33.8(24)		20.8(27)	25.4(33)	46.2(60)	
Age 35 - 65 years old	18.3(13)	28.2(20)	46.5(33)	*p<0.001***	3.8(5)	5.4(7)	9.2(12)	*ns*
Mean Age ± S.D.	45.79 ± 9.625	32 ± 10.675	34.78 ± 11.78		24.63± 6.029	26.27 ± 6.550	25.56 ± 6.38	
Total	19.7(14)	80.3(57)	100(71)		43.8(57)	56.2(73)	100(130)	
Gender								
Homosexual								
Insertive	8.5(6)	8.5(6)	16.9(12)		9.2(12)	8.5(11)	17.7(23)	
Receptive	2.8(2)	22.5(16)	25.4(18)		14.6(19)	23.8(31)	38.5(50)	
Both	8.5(6)	43.7(31)	52.1(37)	*p* <0.05*	17.7(23)	23.8(31)	41.5(54)	*ns*
Bisexual	0	5.6(4)	5.6(4)		1.5(2)	0	1.5(2)	
Others(Not identified)	0	0	0		0.8(1)	0	0.8(1)	
Total	19.7(14)	80.3(57)	100(71)		43.8(57)	56.2(73)	100(130)	
Highest Education								
Primary school	0	5.6(4)	5.6(4)		0.8(1)	0	0.8(1)	
Junior high school	2.8(2)	9.9(7)	12.7(9)		3.8(5)	4.6(6)	8.5(11)	
Senior high school	4.2(3)	16.9(12)	21.1(15)	*ns*	10.8(14)	11.5(15)	22.3(29)	*ns*
Bachelor's degree	12.7(9)	40.8(29)	53.5(38)		22.3(29)	36.2(47)	58.5(76)	
Master degree	0	5.6(4)	5.6(4)		5.4(7)	3.1(4)	8.5(11)	
Doctoral degree	0	1.4(1)	1.4(1)		0.8(1)	0.8(1)	1.5(2)	
Total	19.7(14)	80.3(57)	100(71)		43.8(57)	56.2(73)	100(130)	
Occupation								
Student	0	15.5(11)	15.5(11)		15.4(20)	17.7(23)	33.1(43)	
Freelancer	7(5)	19.7(14)	26.8(19)		3.1(4)	6.2(8)	9.2(12)	
Self-employed	1.4(1)	4.2(3)	5.6(4)		1.5(2)	1.5(2)	3.1(4)	
Company employee	7(5)	15.5(11)	22.5(16)		13.1(17)	18.5(24)	31.5(41)	
Civil servant	1.4(1)	1.4(1)	2.8(2)	*ns*	5.4(7)	6.2(8)	11.5(15)	*ns*
Business owner	2.8(2)	18.3(13)	21.1(15)		3.1(4)	4.6(6)	7.7(10)	
Unemployed	0	5.6(4)	5.6(4)		0.8(1)	1.5(2)	2.3(3)	
Others	0	0	0		1.5(2)	0	1.5(2)	
Total	19.7(14)	80.3(57)	100(71)		43.8(57)	56.2(73)	100(130)	
Monthly income								
No income	0	21.1(15)	21.1(15)		16.2(21)	19.2(25)	35.4(46)	
≤ 10,000 THB	2.8(2)	1.4(1)	4.2(3)		2.3(3)	2.3(3)	4.6(6)	
10,001-20,000 THB	7(5)	15.5(11)	22.5(16)	*ns*	10(13)	10(13)	20(26)	*ns*
20,001- 30,000 THB	4.2(3)	16.9(12)	21.1(15)		3.8(5)	6.2(8)	10(13)	
30,001- 40,000 THB	1.4(1)	8.5(6)	9.9(7)		4.6(6)	7.7(10)	12.3(16)	
≥ 40,001 THB	4.2(3)	16.9(12)	21.1(15)		6.9(9)	10.8(14)	17.7(23)	
Total	19.7(14)	80.3(57)	100(71)		43.8(57)	56.2(73)	100(130)	
Extra income								
Have extra income	15.5(11)	74.6(53)	90.1(64)	*ns*	16.9(22)	21.5(28)	38.5(50)	*ns*
Don't have any extra income	4.2(3)	5.6(4)	9.9(7)		26.9(35)	34.6(45)	61.5(80)	
Total	19.7(14)	80.3(57)	100(71)		43.8(57)	56.2(73)	100(130)	

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01,*

*p-value <0.001***, statistically significant at α = 0.001*

The HIV infected participants who were recruited into the study age between 15 to 65 years old. The results of socio-demographic variables among two groups of participants are established in the above summary table. The overall outcome variables will be discussed in the following parts including age, gender, highest education, occupation, monthly income and extra income, respectively.

Mean age among HIV-positive group is 34.78 years old, *Median* is 33 years old with the *Std. Deviation* ± 11.78, *Minimum* is 15 and *Maximum* is 65. While comparing in the group regarding to use and not use social media, the majority of HIV-infected social media online users are found to be younger than those the majority of infected non-online users. Further statistical tests revealed that age has a significant association with using the online social media to find sex partners among the infected participants (p-value < 0.05).

When compare the age between two groups, the *mean age* among HIV-Negative group is 25.56 years old, the youngest age is 18 years old and the oldest one is 50 years old with the *Std. Deviation* ± 6.36. Again, if comparing among the HIV-non infected participants regarding to use and not use social media, the results suggest similar outcomes which either online users or non-online users are at the age of twenties. The simple statistical analysis of chi-square was used to test whether age has an association with how they use or not use social media in the purpose of seeking sex partner or not. The statistic results showed that among the non-infected participants age has no association to them in terms of deciding to use or not use this platform to seek for sex partner with a *p-value=0.966.*

To what extent, during the time of data collection in the HIV-NAT clinic the participants who are HIV infected MSM and had an appointment to be followed up were more likely to be older patients, thus the difference of mean age between the HIV-infected and HIV-noninfected participants was recognized.

The next outcome variable that will be discussed is gender. The participants were asked to indicate their gender in terms of homosexual; Gay King(insertive), Gay Queen (receptive), Both(versatile), Bisexual and others. The research findings suggest that among two groups of participants, homosexual (versatile or both) were indicated

the most which were approximately 50% of them in each group. As shown in the summary table above, considering among the infected participants first, the results suggest that among online users are found a highest number of them to be versatile as same as the non-online users, the majority of them are found to be versatile according to their self-report towards this question. Further analysis was tested by using a simple statistic of Chi-square test to determine whether gender has an association on using online social media platform to seek for sex partners. The result of statistical testing among the infected participants reveals there is an association of gender and using online social media to seek for sex partners among the infected participants with a *p*-value of 0.028 (*p-value<0.05*). To what extent, it means that those who have a seropositive with reporting their gender as versatile or both they might be more likely to rely on using online social media as a platform to seek for sex partners.

If we now move on to see the results of gender among the non-infected participants, the similar results are revealed which can be seen the majority of the non-infected online users are versatile or both. Further analysis was tested an association between gender and using online social media as a platform to seek for sex partners among the non-infected participants. The contrast result to the infected is seen that there is no association between gender and using online social media as a platform to seek for sex partners among the non-infected participant *(p-value = 0.266).*

To be clear that the protocol was mended to be conducted among men who have sex with men which the definition of men who have sex with men is “those are biological male but indicate that they have ever had sexual intercourse with the same sex”. Therefore, there are a small number that included those who have ever had sexual intercourse with both biological male and female which refers to bisexual. The findings table shows only around 5 percent among HIV positive and only 1.5 percent of HIV-negative participants identified themselves as bisexual.

Moving on to the next following outcome variable which is occupation. Eight difference types of occupations including *students, freelancers, self-employed, company employees, civil servant, Business owners, unemployed and others* were also included in terms of number and percentage in the summary table. Most of the

participants who are in HIV-positive group are freelancer (26.8%) while most of the participants who are HIV-negative are student (33.1%). Again, a simple statistical analysis is used to test an association between occupations and using online social media among two groups of participants. The results from the chi-square test revealed that occupations among both groups of participants does not have an association to the use of online social media as a platform to seek for sex partners with p-value >0.05 in both groups.

From the summary table above previously, it is obviously seen that there is an association of monthly income and occupation among HIV-negative participants which most of them are students and they have no income per month. Apart from that among non-infected group the average income is more than 40,000 THB per month which is accounted for 19.2% (*n=130*). The majority of another group have monthly income is also less than 10,000 THB. Moreover, two groups of participants are categorized into two groups which are online users and non-online users. Taking a closer look on the infected participants, comparing between use and not use online social media as a platform to seek for sex partners, it is found that the majority of the online users among the infected reported no income which is consistent to their occupation. In addition, the simple statistical analysis, Chi-square test, is used to test an association of monthly income and using online social media. The results suggested that there is no association between monthly income and using of online social media as a platform to seek for sex partners among the infected participants. Whereas the similar results are also suggested among the non-infected participants.

The majority of participants among HIV-positive group have the highest educational level in bachelor's degree which accounted for approximately 50% as well as the number of participants who graduated bachelor's degree is accounted for 58% or approximately 76 of 130 among HIV-negative group. When discuss the data in another aspect where categorized the participants into online users and non-online users. Among the infected participants, the results suggested that either online users or non-online users reported they have bachelor's degree as their highest education. As well as the non-infected participants, regardless of use and not use the online social media, they reported the highest education as bachelor's degree. Further statistical analysis was

used to test an association between education level and the use of online social media use among two groups, the chi-square testing revealed no associations among two variables regardless of their HIV-status.

The participants were asked whether they have earn an extra income per month or not, the results were found that more than half of participants among two groups reported they don't have any extra income while a few number of HIV-positive participants (9.8%) reported having an extra income per month. Interestingly, almost forty percent of HIV-negative participants reported having an extra income per month. When further analysis was test by using chi-square test to see an association between having extra income among participants and using the online social media as a platform to seek for sex partners. The statistic results as shown in the summary table previously, there is no association of having extra income and using the online social media as a platform to seek sex partners.

To summarize the socio-demographic variables and the use of online social media, overall among the infected participants, the results suggested that age and gender have an association to using online social media as a platform to seek sex partners while among the non-infected participants, there is no association between all of independent variables and the use of online social media as a platform to seek sex partners.

4.2 Social Media Use and Risky Sexual Behaviors

The total participants were asked to have they used online social media in the purpose of finding sex partners. This is included those who have ever used but did not get any of sex partners from this venue. The participants who responded "*Have ever used*" were required to answer the questions further whereas the others who responded "*Have never used*" social media in the purpose of finding sex partners were not been asked for further but skipped to part three which is related to their off-line behavior.

From the total number of participants, more than a half of them reported have ever used social media especially online applications in the purpose of sex partners seeking. Comparing between HIV-positive and HIV-negative participants, the

percentage of HIV-positive participants was approximately three quarter in a group while among HIV-negative participants the percentage among people who never used and ever used was not relatively different which the percentage of people who ever used was approximately fifty percent.

The respondents were also asked to report the latest use of applications for seeking sex partners. The results were reported in the comparison between two groups, it was surprisingly found the contrary of results between two groups which was almost twenty percent of HIV-positive participants reported latest used a year ago or more than that while none of HIV-negative participants reported using a year ago or more. In the contrary, half of HIV-negative participants reported currently use while only one third of HIV-positive reported currently online users. Further analysis has shown as the following summary table whether the latest use of social media has an association with having had sex partners from using the online social media. The different outcomes of statistical analysis testing among two groups of participants revealed that there is no association of the latest use of social media on having had sex partners among the infected participants (*p-value=0.567*) in the contrary there is an association found among the non- infected participants *(p-value =0.008*, p-value<0.05)*

Table 2 The summary table of online social media use; the latest use, the number of application use, types of application use, the different social media application and the percentage of having sex partners in a comparison between the infected participants and the non-infected participants.

	HIV-positive who are online users (N=57)				HIV-negative who are online users (N=73)			
	Have not got sex partners	Have got sex partners			Have not got sex partners	Have got sex partners		
	%(n)	%(n)	Total	*p-value*	%(n)	%(n)	Total	*p-value*
The latest use of social media								
Currently use	19.3(11)	26.3(15)	45.6(26)		6.8(5)	52.1(38)	58.9(43)	
Within 6 months	8.8(5)	15.8(9)	24.6(14)	*p>0.05 , ns*	1.4(1)	24.7(18)	26(19)	*p<0.01***
Prior than 6 months but within one year	3.5(2)	3.5(2)	7(4)		6.8(5)	8.2(6)	15.1(11)	
A year ago, or more	14(8)	8.8(5)	22.8(13)		0	0	0	
Total	45.6(26)	54.4(31)	100(57)		15.1(11)	84.9(62)	100(73)	
The number of applications use								
1 application used	24.6(14)	31.6(18)	56.1(32)		5.5(4)	38.4(28)	43.8(32)	
2 applications used	17.5(10)	221.1(12)	38.6(22)		0	8.2(6)	8.2(6)	
3 applications used	1.8(1)	1.8(1)	3.5(2)	*p>0.05 , ns*	2.7(2)	8.2(6)	11(8)	*p<0.05**
4 applications used	1.8(1)	0	1.8(1)		5.5(4)	4.1(3)	9.6(7)	
5 applications used	0	0	0		1.4(1)	26(19)	27.4(20)	
Total	45.6(26)	54.4(31)	100(57)		15.1(11)	84.9(62)	100(73)	
Type of the number one application ranked that is using								
General social media application	7(4)	7(4)	14(8)		1.4(1)	28.8(21)	30.1(22)	
Dating social media application	33.3(19)	43.9(25)	77.2(44)	*p>0.05 , ns*	13.7(10)	52.1(38)	65.8(48)	*p>0.05 , ns*
Others	5.3(3)	3.5(2)	8.8(5)		0	4.1(3)	4.1(3)	
Total	45.6(26)	54.4(31)	100(57)		15.1(11)	84.9(62)	100(73)	
The different application that was utilized the most ranked as the first app								
Hornet	15.8(9)	29.8(17)	45.6(26)		6.8(5)	37(27)	43.8(32)	
Facebook	3.5(2)	1.8(1)	5.3(3)		1.4(1)	16.4(12)	17.8(13)	
Blued	5.3(3)	5.3(3)	8.8(5)		1.4(1)	4.1(3)	5.5(4)	
Jack'd	5.3(3)	3.5(2)	8.8(5)		1.4(1)	4.1(3)	5.5(4)	
Grindr	5.3(3)	3.5(2)	8.8(5)	*p>0.05 , ns*	1.4(1)	1.4(1)	2.7(2)	*p>0.05 , ns*
Tinder	1.8(1)	1.8(1)	3.5(2)		2.7(2)	4.1(3)	6.8(5)	
Twitter	1.8(1)	5.3(3)	7(4)		0	2.7(2)	2.7(2)	
Line	1.8(1)	0	1.8(1)		0	5.5(4)	5.5(4)	
Instragram	0	0	0		0	4.1(3)	4.1(3)	
Others (Betalk, Growlr, Gay Romeo, Wechat ect.)	5.3(3)	3.5(2)	8.8(5)		0	4.1(3)	4.1(3)	
Total	45.6(26)	54.4(31)	100(57)		15.1(11)	84.9(62)	100(73)	

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01,*

*p-value <0.001***, statistically significant at α = 0.001*

The participants who reported using applications for seeking sex partners were asked which applications that they used and the number of applications that they normally used. The previous above table illustrates applications and the number of applications that they used between HIV-positive and HIV-negative group. The participants were asked to response towards the question “How many applications that were currently using in order to seek sex partners?” The above table as mention earlier illustrated the number of applications that participant reported using from their experience in the past one year. The comparison between HIV-positive and HIV-

negative group was also shown in the above table. Among both groups of participants, the number of applications that reported using was mostly reported one application which can be seen in the same direction. In contrast, HIV-negative participants tend to use more applications than HIV-positive participants as it can be seen from approximately nineteen percent of HIV-negative group reported using five applications while none of HIV-positive group reported using as many as five applications at the same time in order to get sex partners from online venue.

Further analysis comparing between different two groups of HIV-status; HIV-infected and HIV-noninfected in the aspects of the number of applications use to seek for sex partners. According to the hypothesis testing to determine an association between the number of applications use and obtaining sex partners from the online platform among the online users regardless of HIV-status. The chi-square test was deployed to test an association regarding to the hypothesis. First, the author would like to discuss the outcome of the statistical analysis among the HIV-infected, as it can be seen in the previous summary table (table 2.) approximately half of the HIV-infected online social media users participants tend to use one application to seek for sex partners and of those one app users, one third of them have got sex partners from using one application. However, when further statistical analysis was mentioned earlier in the summary table shows non-significant association between the number of application use and having sex partners from their direct experience with *p-value* = 0.740 *(p-value > 0.05).*

On the other hand, when considering the outcomes among the HIV-noninfected participants. The result is somewhat counterintuitive that among the HIV-noninfected participants most likely to rely on one application use while the second highest number among the app users rely on many applications as many as five applications. Surprisingly, when the chi-square testing was deployed to determine an association between the number of application use and having sex partners from the online platform among the HIV-noninfected participants, there is a significant association between the number of application use and the chance of having sex partners from the online platforms with *p-value = 0.011 (p-value <0.05).* One important thing to be noted is that

to use only one application with HIV-noninfected status MSM should be concerned a chance of having sex partners from using online social media as a platform.

Further discussion from the results of the study, social media use among applications users differentiated according to the number of applications and the latest of application use.

As revealed in this study, all HIV-positive subjects rely on mainstream social media applications such as Twitter, Facebook and Line alongside gay-dating applications such as Hornet, Blued, JackD and Grindr to find sleeping partners. The number of applications used by the majority of HIV-positive subjects (80%) is between 1 and 2. Upon closer examination, the researcher found that the application used by one-application users is always of gay-dating category, while two-application users tend to be active on at least one gay-dating application. Those who use between 3-4 apps make up only 20% of the HIV-positive population. Once again, this group of subjects displays their simultaneous use of mainstream and dating applications. The group of 3-application users tends to have at least one general social media application in addition to their other gay-dating applications. This is similar to the group of 4-application users who have at least one application that is not specifically designed for gay dating.

When looking at gay-dating applications with the highest number of users, the first place goes to Hornet, followed by Blued, JackD and Grindr. It should also be noted JackD and Grindr are very close in numbers of users. As for mainstream social media applications, the majority of the positive MSM prefer Twitter over Facebook and Line.

Moving on to the HIV-negative populations, the subjects can be divided into 5 different groups based on the number of applications they use. The first group is made up of 32 MSM who use only one application of gay dating category with Hornet being the most popular. The next group is two-app users with both of the applications they use being specifically designed for dating. In the group of three-app users, all of the three applications are for general purposes. As for the group of four-app users, the ratio of general applications to dating application is 3:1. The last group is composed of 5-

app users. Three of the applications they use are general purpose while the other two are for dating.

The pattern of social media use regarding to the number of apps use between positive and negative populations shows similarities. For example, the main purpose of their use of social media applications is to seek sleeping partners. For all subjects regardless of their infection status who are active on only one application, the application they use always falls in the category of gay dating with Hornet being the most popular. The number of applications used by the MSM subjects shows an interesting correlation with their awareness of infection status. The MSM subjects who have been made aware of their HIV positive status are less likely to be active on many applications at the same time, and they tend to spend more time on the general social-media applications. This is in contrast with the negative population whose simultaneous use of many applications is relatively common. An example can be seen in the group of five-app users who use Facebook, Twitter, Line and Instragram together with one dating application.

Comparing the use of social media applications by HIIV-negative and HIV-positive users who are active on two applications. The types of applications they use range between general purpose and dating purpose.

To consider the HIV-negative populations first, there are 6 participants in total who are active on only two applications. However, based on the combination of the application types they use, it was found that participants whose two active applications are of dating types make up half of the sample (n=3). This is followed by the group of HIV-negative MSM who use a combination of general and dating applications (n=2). The use of two applications both of which are for general purpose is practiced by only 1 user of this population.

Moving on to the HIV-positive population, there are as many as 21 users who are active on only two apps. One striking similarity is the fact that the group of two dating applications constitutes more than half of the sample (n=12) similar to what is found in the HIV-negative counterpart. The use of one general app with one dating app is practiced by 7 users. The use of two applications both of which are general

purpose is once again not very common with only 2 subjects appearing to have this behavior.

Considering the use of social media applications by HIIV-negative and HIV-positive users who are active on three applications with types of applications used ranging between general and dating purposes.

From a broad perspective, there is a noticeable discrepancy in the number of three-app users between HIV-positive (N=2) and HIV-negative groups (N=8). To consider the HIV-negative users first, the most common pattern is seen in the configuration in which all three applications are for general purpose, as this group makes up 50 percent of the surveyed (n=4). The next most common setting is the use of two dating apps with one general app, which is practiced by 3 non-infected subjects. The use of three dating apps is practiced by only 1 user.

However, none of the HIV-negative participants use two general apps with one dating app. As for the HIV-positive population, the total number of three-app users is 2 with the use of two dating apps together with one general app being the only pattern observed.

Discussing the use of social media applications by HIIV-negative and HIV-positive users who are active on four applications that belong to general and dating categories. Overall, it is apparent that the number of HIV-negative four-app users is significantly larger than that of the HIV-positive counterparts. The two most common patterns observed are first the use of three general apps with one dating app (n=4) and two general apps with two dating apps (n=3). Conversely, the use of four applications is practiced by only 1 HIV-positive user.

Comparing the use of social media applications by HIIV-negative and HIV-positive users who are active on five applications that belong to general and dating categories.Overall, one of the most noticeable features is that the use of five applications is not practised by any HIV-positive participants. On the contrary, this behavior is exhibited by as many as 21 HIV-negative users. The most common pattern can be found among 15 participants where the ratio of general apps to dating apps is

3:1 and 3:2. However, the configuration where dating applications outnumber general applications is observable in only 5 HIV-negative participants.

To summarize how social media application use in terms of the number of use and latest use, the patterns among two groups of participants were found to be slightly different in terms of the number of applications use while in the aspect of which application, the results revealed in the similar results. The next following section will illustrate the summarize information among online application users which categorized following the latest of use the application and differentiated into groups depend on the number of application use.

4.2.1. Applications use among Men who have sex with men

From a previous summary table(table 2) , the participants have reported a number of applications use in the range from one to five. Moreover, the participants have been asked to rate the application that they used most of the time as number one or rate application as the first rank. The following section is intended to represent the information about the types of applications and the specific application that was ranked the first as defining as using most of the time among applications users that they reported using at the same time.

Talking about types of applications, it can be categorized into two types of the applications according to the purpose of using among the participants in this study. General social media application is defined for general purpose communication which including Facebook, Line, Twitter and Instragram. Another type of application is Dating social media applications which including Hornet, Grindr, Jack'd, Blued, Tinder ect. In this study, the author also intended to reveal these two categories of applications and having sex partners among two groups of participants according to the HIV-status.

Considering the results of two different types of the most used application and having sex partners among the HIV-infected participants. It is obviously seen that they use dating social media application was utilized the most which accounted for three of fourth among the online users. When consider among those who have sex partners from this online platform, again those who reported having sex partners utilized dating

application as their platform to achieve their purpose. Further analysis to determine whether there is an association between different types of applications and having sex partners among the HIV-infected. Chi-square statistic analysis testing is used to determine this hypothesis. The result of statistical analysis reveals that among the HIV-infected participants, there is no association between using different types of application and having sex partners among online users in this study *(p-value = 0.747, p-value >0.05)*. What simply means is that among the HIV-infected either choosing general app or dating app does have an effect on having sex partners.

Closer inspection of the table shows the similar result among the HIV-noninfected in terms of types of application used among the participants. As it is obviously seen in the previous table, the noninfected online users reported using dating application the most while considering in the aspects of having got sex partners which accounted for more than eighty percent of the total of the online users, dating application was reported using from fifty percent of those who have got sex partners. However, when further analysis using the Chi-square test shows the non-significant association between type of the most frequently use application and having sex partners from these online platforms (*p-value = 0.159, p-value < 0.05*)

According to the above summary table, *Hornet*, a gay dating application, was the application that both HIV-positive and HIV-negative participants reported using most of the time. It can be obviously seen that almost half of participants among both groups who reported using online social media as a venue to connect with people with or without the purpose of finding sex partners rated “Hornet application” as the first application if they would want to seek sex partners through online platforms. Taking a closer look at the infected participants first, the majority of them reported using Hornet app which accounted for almost fifty percent of the total online users. Further analysis differentiated according to having sex partners from specific application, again the majority of online users who reported having sex partners practiced Hornet app as their platform to seek sex partners. The chi-square test was used to test the relationship between the different apps and having sex partners regarding to the hypothesis that was setting as is there a relationship between using different specific application and having sex partners among the infected participants. The chi-square test reveals the *p-value as*

0.758 (p-value>0.05). It can be explained that among the infected participants, using different apps does not have an influence on having sex partners.

If we now turn to focus on the outcome of the noninfected participants, it is obviously seen that among the noninfected online users reported using Hornet app the most. When consider those who utilized online platform and have sex partners, the majority of the noninfected Hornet app users have got sex partners from this platform. While the second app that was used among the noninfected online users is general social media app called Facebook. Of those who are Facebook users, more than 3:4 of them reported having sex partners from this venue. Further analysis using the chi-square test to determine the hypothesis, is there an association between using different apps and having sex partners among the noninfected participants. The result reveals in the previous table that among the noninfected participants in this study using different applications as platform to seek sex partners have no association to having sex partners with *p-value 0.593 (p-value> 0.05).*

4.2.2. Reasons for using applications

According to participants choosing different application as a platform to seek sleeping partners, what are the reasons that trigger them to choose different application. From the responses obtained from subjects who reported using online social media to seek sleeping partners can be categorized into three groups with relation to their power of motivation. The first group was categorized as a group that choose the application according to the quality of application including the app is easy to download and use, the app does not require disclosure of user's personal information and the app is stable. The second group was categorized as a group of users who choose the application according to their desires which included as the followings: to satisfy their curiosity, for recreational purpose, to seek companionship, to seek a serious relationship, use the app to seek one-nightstand sleeping partners, and use the app in search for drugs. Another group is categorized as a kind of users who choose the particular application according to social influences; Choose the app because peer pressure, use the app for its popularity and choose the app because it requires practically no ice breaking.

Table3. Reasons for choosing the application among online application users in a comparison between HIV-positive and HIV-negative participants

	HIV-positive (N=57)			HIV-negative (N=73)		
Reasons for choosing the application	**n(%)**	**Standardized Coefficients Beta**	***p-value***	**n(%)**	**Standardized Coefficients Beta**	***p-value***
Use the app as a result of peer pressure	12(21.1)	0.315	**p < 0.05*	1(1.4)	0.170	****p < 0.001*
Use the app for recreational purpose	7(12.3)	0.343	***p < 0.01*	8(11)	0.348	****p < 0.001*
Use the app to seek only one-nightstand sleeping partners	7(12.3)	0.343	***p < 0.01*	11(15.1)	0.456	****p < 0.001*
The user seeks companionship or to kill the time chatting with someone	6(10.5)	0.467	****p < 0.001*	7(9.6)	0.323	****p < 0.001*
Choose the app for its popularity	4(7)	0.465	****p < 0.001*	13(17.8)	0.400	****p < 0.001*
The app is easy to download and to use	4(7)	0.116	*0.313*	18(24.7)	0.596	****p < 0.001*
The user uses the app to satisfy their curiosity	4(7)	0.232	**p < 0.05*	1(1.4)	0.170	****p < 0.001*
Choose the app because it requires practically no ice-breaking	3(5.3)	0.27	**p < 0.05*	8(11)	0.348	****p < 0.001*
The app does not require disclosure of user's personal information	2(3.5)	0.167	*0.132*	2(2.7)	0.240	****p < 0.001*
The app is stable (e.g. run smoothly during active online)	2(3.5)	0.334	***p < 0.01*	1(1.4)	0.170	****p < 0.001*
Use the app to seek a serious relationship	1(1.8)	0.000	*1.000*	1(1.4)	0.170	****p < 0.001*
Use the app in search for drugs	0	-	-	1(1.4)	0.170	****p < 0.001*
Others (e.g. to keep watch of their significant other ect.)	5(8.8)	0.103	*0.379*	1(1.4)	0.170	****p < 0.001*
Total	(100)(57)			73(100)		

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01,*

*p-value <0.001***, statistically significant at α = 0.001*

Comparing the results among two groups of subjects distinguished by HIV-status, among two groups have different reasons for choosing the application. From the above comparison table, looking at the HIV-infected participants, nearly 1:4 of them reported peer pressure can influence them to choose any individual application while the HIV-non infected found peer pressure does not influence their decision to choose any application. Interestingly, the main reason for one fourth of HIV-non infected to choose the certain application is easy to download and use of application. There is no significant difference among two groups which the similar proportion of participant reported choosing the application according to two reasons; for recreational purpose and looking for sex (one-nightstand partners). Surprisingly, almost twenty percent of the HIV-non infected respondents reported reason of choosing application regarding to the popularity of its application. Another difference is some of the HIV-non infected participants reported choosing application because the certain application allowing them to have a first time but normal conversation with completely strangers less awkward while another group of participants do not find this reason can affect their decision to choose the application.

Further analysis using logistic regression has done to explore whether different reasons that they have reported can have an influence on having sleeping partners form their online social media use. With a question, “do reasons of choosing application have an influence on the probability of having sleeping partners among HIV-infected participants”.According to the statistical null hypothesis, the probability of having sleeping partners in the last one year from the online application is not associated with the reasons of choosing application among the HIV-infected participants, the results were revealed in the previous tables. Considering the significant association, it was found that some reasons of choosing application have an influence on having sleeping partners among HIV-infected participants. However, if closer monitoring at individual reason, there are eight reasons that could have possibility to influence having sleeping partners. Of those who choosing any application according to these reasons; the app is stable (*p-value* 0.003), to satisfy their curiosity (*p-value* 0.046), to seek a companionship(p-value 0.00), to find sex or casual sleeping partners*(p-value 0.006)*, for recreational purpose*(p-value 0.006)*, peer pressures *(p-value 0.018)*, the popularity of its application *(p-value 0.00)* and choosing because it requires no ice breaking *(p-value 0.019). Hence, the null hypothesis is rejected and the alternative is accepted with a significant p-value of 0.003 with* R^2 *0.376.*

Considering the same question but among HIV-non infected participants, do the reasons of choosing application can have an influence on possibility of having sleeping partners form the online application among HIV-non infected participants.

The null hypothesis is the probability of having sleeping partners from the online social media use among HIV-non infected have no association with reasons of choosing to use any application. The following tables illustrated the results of logistic regression analysis.

It is apparent from the reported results from the above tables that among HIV-non infected considering reasons of choosing any application as a platform to seek sleeping partners have an influence on probability of having sleeping partners with the statistical analysis of

p-value 0.000 with degree of freedom of 12. What is revealing in the table 6 is that of all HIV-non infected online users who reported reasons of choosing application as followings; easy to download and use*(p-value 0.000),* app does not require personal information *(p-value 0.000),* the app is stable *(p-value 0.001),* to satisfy their curiosity*(p-value 0.001),*to seek companionship *(p-value 0.000),* to seek a serious relationship(p-value 0.001), to find sleeping partner *(p-value 0.000),* looking for drugs *(p-value 0,001),* use for recreational purpose *(p-value 0.000),* use because of a result of peer influence(p-value 0.001), choose the app for its popularity *(p-value 0.000),* choose the app because it requires practically no ice breaking *(p-value 0.001),* having the possibility of having sleeping partner form this venue almost seventy percent according to R square (0.717).

To summarize the results of null hypothesis testing among HIV-non infected, among online application users any reasons that they have reported in order to use the application, they have possibility to have sleeping partners from this online platform as high as seventy percent chance.

The next section will exhibit the data for more explanation from the interview among participants who were willing to provide more information from the questionnaire.

The example of reasons given from the interviewee who response that the reason to choose the application is for recreational purpose.

"I found myself much enjoyed using Jack'd application because a lot of photo showing on the screen per each time of searching. As well as, I can see their private photo by requesting to see, I found it fun to see and share mine to others if the conversation seems get along quiet well with some people." PID number 001, HIV status; positive, age 36 years old.

Another example from the subjects who reported choosing to use the application in the recreational purpose or just to kill the time chatting with someone online.

"I used application called "Hornet" about four months ago, the reason I chose this application is the stability of application, and it is enjoyable and fun to chat

with people who are online. I actually spent my time just to stay occupy sometimes, I merely agreed or decided to meet people in person who I chatted in the application." PID018, HIV-status: positive, age 38

To provide the example of reasons of choosing application in terms of application does not require user's personal information. Two interviewees reported as the followings:

"I chose Hornet because it is very easy to use. I don't have to register any information and the application does not require users to input real personal information. PID002, HIV-status positive: positive, age 42 years old.

"I chose Grindr because it does not require any personal information, any pictures and I found out this application is very user-friendly." PID003, HIV-status: positive, age 41 years old.

4.2.3. Applications use and number of sex partners

It is understandable that people who reported using online applications might be neither able to get sex partners nor not even get sex partners which actually can be seen from the results of this study that depends on how they utilized the applications in many various ways. From the results of this study, it can possibly say that successful rate of getting sex partners through online applications use is calculated by the number of application users who reported have ever got sex partners through online application venue over the total number of application users including who reported not having sex partners through online.

In this study, the author intended to reveal the differences between HIV-negative and HIV-positive participants as the followings.

X_1: The number of HIV- positive application users who reported has ever got sex partners in the past one year

X_2: The number of HIV-negative application users who reported has ever got sex partners in the past one year

Y1: The total number of HIV-positive application users (N=57)

Y2: The total number of HIV-negative application users (N=73)

The successful rate of getting sex partners through online applications venue: $\frac{X}{Y} \times 100$

- The successful rate among HIV-positive application users is

$$\frac{X1}{Y1} \times 100 = \frac{31}{57} \times 100$$

$$= 52.63\ \%$$

- The successful rate among HIV- negative application users is

$$\frac{X2}{Y2} \times 100 = \frac{62}{73} \times 100$$

$$= 86.30\%$$

As the results of the study, the number of HIV-negative participants had reported getting sex partners from using applications higher than HIV-positive participants approximately 30%. The following chart was intended to represent the information.

This study was also intended to explore the number of sex partners in three different; one-night stand, regular sex partners (not included couples), and exchange sex for money (commercial sex). The following summary table will illustrate the total number of sex partners in the past one year in three categories of sex partner types in a comparison between HIV-positive and HIV-negative participants.

Table 4. The summary table of number of sex partners and types in a comparison between HIV-positive and HIV-negative participants who are application users

The number of sex partners according to type of sex partners	HIV-positive(N=57) %(n)	HIV-negative(N=73) %(n)	p-value
One-nightstand sex partners			
None	20(26)	7.7(10)	
1-2 people	8.5(11)	18.5(24)	
3-4 people	6.9(9)	8.5(11)	
5-6 people	3.1(4)	5.4(7)	*p<0.01***
7-8 people	0.8(1)	0.8(1)	
9-10 people	2.3(3)	6.9(9)	
More than 10 people	2.3(3)	8.5(11)	
Total	43.8(57)	56.2(73)	
Regular sex partners			
None	43.1(56)	32.3(42)	
1-2 people	0	17.7(23)	
3-4 people	0.8(1)	3.1(4)	
5-6 people	0	2.3(3)	*p<0.001****
7-8 people	0	0.8(1)	
9-10 people	0	0	
More than 10 people	0	0	
Total	43.8(57)	56.2(73)	
Sex worker partners			
None	43.8(57)	51.5(67)	
1-2 people	0	2.3(3)	
3-4 people	0	0	
5-6 people	0	0.8(1)	*p>0.05, ns*
7-8 people	0	0	
9-10 people	0	0.8(1)	
More than 10 people	0	0.8(1)	
Total	43.8(57)	56.2(73)	

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01, p-value <0.001***, statistically significant at α = 0.001*

According to the question *"have you ever got sex partners from online platforms in the past one year?*", more than fifty percent among both groups of the participants responded experiencing get sex partners from online platforms. The table above illustrates the descriptive information including frequency and percentage of three different types of sex partners, the number of sex partners with a comparison between two groups of participants regarding to their HIV-status.

Taking a closer look at the infected participants who are online users reported the information on their history of sex partners and the number of sex partners who they met from the online platform. To explain what is apparent in the table, among the infected online users who reported have got sex partners from online platform, the

majority of them reported having had one-nightstand sex partners. When further focus on three different types of sex partners, only one of the infected online users reported having had regular sex partners while none of them reported having had sex workers as their sex partners during using online as a platform for seeking sex partners.

As shown in table , the outcomes among the non-infected are also revealed in a comparison with the infected. The results suggest that all of those who reported having had one nightstand sex partners from online platform. Moving on to another type of sex partners, regular sex partners, using these online platforms allows half of them obtaining regular partners. Another type of sex partners, sex workers, less than ten percent of them reported having had this type of sex partners from using online platform. To be noted that there are greater number of HIV-negative participants reported got sex partners which accounted for approximately three quarter of the total number of HIV-negative application users than HIV-positive participants who reported have got sex partners from applications. Moreover, the results of this section revealed among HIV-positive participants that most of them did not have regular partners and commercial sex partners while almost half of HIV- negative participants still reported having regular sex partners and around ten percent of them reported having sex by exchanging money with people they met through online application.

Further statistical analysis shows a significant relation according to the hypothesis; is there a relationship of HIV-status and having different types of sex partners and the number of sex partners. The Chi-square testing shows a significant p-value that HIV-status especially the noninfected has an influence of having the one-nightstand *(p-value = 0.004*, p-value<0.05)* and regular sex partners *(p-value=0.000*, p-value <0.05)*

4.2.4. MSM Engaging to risky sexual behaviors through online applications.

Risky sexual behaviors among participants were focused with only those who are application users with reported having experience getting sex partners who met through online platforms within the last one year; HIV-positive (n=31) and HIV-negative (n=62).The main reason is because the risky sexual behaviors are focused on those who are online users and obtain sex partners from this venue while it is true that there are a number of them reported using online but they did not meet sex partners

from their online behaviors, therefore, in this section the number of participants who are included into the analysis will be less than the total number of the online users. The outcomes were classified in four topics including condom use, alcohol use before having sex, drugs use before having sex, and history of having multiple sex partners especially having sex parties (sex mhoo). The respondents were required to give answers towards each situation. The questions in this part are binary questions. However, there are specific requirement for those who responded "yes" towards each particular situation, they have to indicate the degree of frequency between always *(100 percent)* perform safe sex activities with everyone who met through online platform and sometimes *(50 percent)* perform safe sex activities with someone who met through online platform. In the aspect of condom use, the questions were primarily related to using condom one hundred percent with everyone who met through online platform as well as experience of having accident with condom use during having sexual intercourse such as condom leak, and condom dislodge during having sexual activities. The respondents who responded have ever had experience with accidental condom use were required to give more information on how they dealt with the situations. This specific information can give us how MSM concern themselves at risk or not.

4.2.4.1. Condom use

The participants were required to provide the information within the past one year about their behaviors with people only who they met through online venues related to condom use. The respondents were required to indicate frequent of condom use whether always use condom with everyone who met through online platforms, use condom sometimes with people who met through online platforms and no condom use with people who met through online platforms. Experiencing of accidental of condom use including condom dislodge and condom leakage during having sexual intercourse was required to provide the information by yes-no question whether in the past one year having experiences of accidental with using condom such as condom leakage or dislodge during having sexual activities.

Table 5. The summary table of condom use with people met through online application between HIV-positive and HIV-negative participants

Condom use (1 HIV-negative chose not to answer this question)	**HIV-Positive (N=31) %(n)**	**HIV-Negative (N=62) %(n)**	*p*-value
Always	23.6(22)	46.2(43)	*p<0.001***
Sometimes	6.5(6)	18.3(17)	
Never	3.2(3)	1.1(1)	
Total	33.3(31)	65.6(61)	
Have ever had experience of accidental with condom use such as condom dislodge during having sexual intercourse			*p>0.05, ns*
Yes	2.2(2)	10.8(10)	
No	31.2(29)	54.8(51)	
Total	33.3(31)	65.6(61)	
Have ever had experience of accidental with condom use such as condom leakage during having sexual intercourse			*p>0.05, ns*
Yes	2.2(2)	11.8(11)	
No	31.2(29)	53.8(50)	
Total	33.3(31)	65.6(61)	

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01, p-value <0.001***, statistically significant at α = 0.001*

The summary table above results the percentage of condom use in a comparison between HIV-infected and noninfected who are online users and met sex partners from online venue. Taking a closer look at the percentage of condom use among the infected participants, ninety percent of them reported using condom use sometimes not always, interestingly none of them reported always using condom while only a few of them reported never used condom during sexual intercourse. Comparing the percentage of condom use among the infected to the noninfected, it is obviously seen that approximately seventy percent of them reported always use condom which means these number of them practice one hundred percent safe sex, while only one of them reported practices unsafe sex during have a sexual intercourse. When the Chi-square test is used to explore whether the HIV-status is independence to practicing safe sex in the aspects of condom use. The result suggests that HIV-status has an influence on how to use condom (*p-value = 0.000*, p -value <0.05*) specifically if considering on the infected they seemed practices less safe sex than the noninfected in the aspects of one hundred percent rate (Always) reported using condom during sexual intercourse.

Next questions investigate whether the respondents have experienced an accident condom use during sex activity. The results in the above table reveal that the majority of them never experienced having accident condom use. Furthermore, the chi-square test shows no relation between two variables which are HIV-status and Condom use.

4.2.4.2. Alcohol use before having sex

The respondents who reported using applications to get sex partners were asked to indicate whether they drink alcohol before having sex with people who met through online venues or not. The respondents also had to indicate the frequency of using alcohol in terms of never used, sometimes and always. To this question, there was only 1 HIV-positive participant who chose not to answer as well as 3 HIV-negative participants chose not to answer this question.

Table6. the summary of alcohol use before having sex with people met through applications

Alcohol use before having sex with partners who met through online platforms (1 HIV-negative chose not to answer this question)	**HIV-Positive (n=31)** **%(n)**	**HIV-Negative (n=62)** **%(n)**	**p-value**
Always	1.1(1)	0	*p<0.001***
Sometimes	3.2(3)	35.5(33)	
Never	29(27)	30.1(28)	
Total	33.3(31)	65.6(61)	

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01, p-value <0.001***, statistically significant at α = 0.001*

As it can be seen from the summary table above, among those who have had sex partners through online venues, approximately ninety percent of HIV-positive participants reported did not used alcohol before having sex while approximately half of HIV-negative participants reported sometimes they drank alcohol before having sex with people who they met through online venue. Again, a statistical analysis is used to the test of independence whether two variables between HIV-status and alcohol use are related to each other or not. After the Chi-square was tested, the p-value *(p-value= 0.000*, p-value <0.05)* suggests that the HIV-status has somewhat influence on how to practice drinking alcohol before having sexual intercourse. As well as the descriptive

analysis show that the noninfected participants tend to drink alcohol more than the infected participants.

4.2.4.3. Drugs use before having sex

The participants were asked to response whether they use illicit drugs before having sex with people they meet from online applications. The questions related to drugs are divided into two questions which the first question is focused on the sexual stimulating drugs use including Popper, Viagra and others. The second question is focused on the drugs including Ice, Meth, Ecstasy, Cocaine, and others.

Table7. The summary of drugs (sexual stimulants; Popper, Viagra etc.) use before having sex

Drugs use before having sex with partners who met through online platforms (1 HIV-negative chose not to answer this question)	**HIV-Positive (n=31) %(n)**	**HIV-Negative (n=62) %(n)**	**Chi-square p-value**
Always	0	1.1(1)	*p>0.05, ns*
Sometimes	5.4(5)	20.4(19)	
Never	28(26)	45.2(42)	
Total	33.3(31)	65.6(61)	

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01, p-value <0.001***, statistically significant at α = 0.001*

Table8. The summary of Drugs (Ice, Meth, Ecstasy, Cocaine, and etc.) use among HIV-positive and HIV-negative

Drugs use before having sex with partners who met through online platforms (1 HIV-negative chose not to answer this question)	**HIV-Positive (n=31) %(n)**	**HIV-Negative (n=62) %(n)**	**Chi-square p-value**
Always	0	1.1(1)	*p>0.05, ns*
Sometimes	1.1(1)	14(13)	
Never	32.3(30)	51.6(48)	
Total	33.3(31)	65.6(61)	

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01, p-value <0.001***, statistically significant at α = 0.001*

According to the above table, the minority of participants reported they only sometimes using sexual stimulating drugs especially popper with people who they met from online applications. While another type of drugs is reported use sometimes by the noninfected participants which it is found that they reported the drug that mostly use is Ice. Further analysis determines independence test between two variables between HIV-status and drugs use. The results from the above two tables illustrate that there are no association between different HIV-status and drugs using among the participants who are online users and reported having met sex partners through online platform.

4.2.6.4. Having sex parties

In this section the respondents were required to answer whether they have experiencing join the sex parties from the invitation of who they met from the online platform.

Table 9. The summary of having sex parties/sex mhoo in a comparison between HIV-positive and HIV-negative.

Have ever had sex parties/sex mhoo with people who met through online platforms (1 HIV-negative chose not to answer this question)	**HIV-Positive(n=31)** **%(n)**	**HIV-Negative(n=62)** **%(n)**	**Chi-square** **p-value**
Yes, I have	3.2(3)	22.6(21)	*p<0.05**
No, I have never	30.1(28)	43(40)	
Total	33.3(31)	65.6(61)	

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01, p-value <0.001***, statistically significant at α = 0.001*

From the summary table 10, the percentage of having experience of joining sex parties with sex partners who met from online platforms in a comparison between HIV-infected and noninfected is illustrated. It is obviously seen that the rate of noninfected participants reported have experience higher than the infected participants. When the Chi-square test suggests a significant association *(p-value*

0.029, p-value <0.05)* between HIV-status and having sex parties which it indicates that in terms of joining sex parties, those who have noninfected status are more likely to have a chance be a part of the activities than those who are the infected one.

4.3. How online social media application was utilized among the MSM online users

In this study, how online social media in terms of creating profile account, carrying conversation, posting photo, and using VDO function that available in the application. The overall responses from the online users were reviewed and grouping into different categories depends on how they use. The section below will discuss the outcomes related to the open-end questions from the questionnaire.

The beginning part of any application is always started with generating profile. This topic, the author will establish the results both the quantitative information and qualitative information from the participant who were willing to provide more information during the session of questionnaire has done.

4.3.1. Creating profile

The following table shows the results of how online users responded to the question of how you normally create your profile account if you want to join in the application. The data is displayed in comparison among two groups of participants differentiated by HIV-status.

Table 10 the summary table of creating profile among HIV-positive and HIV-negative participants.

Creating profile	HIV-positive (n=57) %(n)		Total	Coefficient			HIV-negative (n=71) %(n)		Total	Coefficient		
				Beta	t	Sig.				Beta	t	Sig.
	No	Yes					No	Yes				
Information Disclosure												
Provide full name /alias	27.7(36)	16.2(21)	43.8(57)	0.305	2.271	*p<0.05**	53.1(69)	3.1(4)	56.2(73)	-0.017	-0.252	*p>0.05, ns*
Provide age/body weight/height/ chest circumference	19.2(25)	24.6(32)	43.8(57)	0.301	2.327	*p<0.05**	37.7(49)	18.5(24)	56.2(73)	0.447	7.077	*p<0.001***
Provide personal contact (e.g.ID line, FB account, IG account, tel. etc.)	40(52)	3.8(5)	43.8(57)	-0.235	-1.871	*p>0.05, ns*	51.5(67)	4.6(6)	56.2(73)	0.167	2.496	*p<0.05**
Provide nothing but their profile picture	41.5(54)	2.3(3)	43.8(57)	0.034	0.288	*p>0.05, ns*	53.8(70)	2.3(3)	56.2(73)	0.254	3.358	*p<0.01***
Non-disclose their information												
Provide false identity (e.g. age, photo, name etc.)	41.5(54)	2.3(3)	43.8(57)	0.079	0.661	*p>0.05, ns*	55.4(72)	0.8(1)	56.2(73)	0.000	0.000	*p>0.05, ns*
Preserve their own anonymity	36.9(48)	6.9(9)	43.8(57)	0.28	2.161	*p<0.05**	47.7(62)	8.5(11)	56.2(73)	0.319	5.038	*p<0.001***
Others	40(52)	3.8(5)	43.8(57)	0.206	1.722	*p>0.05, ns*	35.4(46)	20.8(27)	56.2(73)	0.512	8.162	*p<0.001***

From the overview of outcomes, the pattern of how they created profile are illustrated which can be categorized in to two groups depend on information disclosure. While it is interesting that the majority of HIV-positive participants reported they registered and created their profile by providing their full name or their alias. In a discrepancy contrast, only the minority of HIV-negative registered to create their profile providing their full name and alias. The similar outcomes among two groups of participants were found that they most likely to provide their information related to their appearance e.g. age, body weight, height, and chest circumferences whereas the similarity was also found

that both groups if they do not provide information, they would rather preserve their anonymity in creating profile.

There are the data from the interviewees that provide us more information about creating profile, the examples are as followings;

The example of those who disclose their information to other users

"I told age, body weight and Height and my type" PID148, HIV-status: Negative,
"Body weight, Height, and types" PID152, HIV-status: Negative
"I indicated my body appearance: Body weight and height" PID201, HIV -status: Negative

The example of those who not disclose their information to other users

"I use my fake id, fake name, fake pictures, and fake accounts. Sometimes other people started a conversation with me I would ask them to send me their real pictures because I am al afraid of faking accounts too." PID016, HIV-status: positive, Aged 26 years old.

"I never used my picture to represent myself in the application." PID 017, HIV-status: positive, Aged 30 years old.

"I did not write anything about me" PID079, HIV-status: negative, Aged 23 years old.

"I did not write anything. Leaving my profile blank seems interesting" PID083, HIV-status: negative, Aged 23 years old.

Hypothesis testing

Null Hypothesis: The different characteristics of creating profile among HIV-positive and HIV-negative does not have an influence on the probability of having sleeping partners from the online venue.

H1: The difference characteristics of creating profile among HIV-positive have an influence on the probability of having sleeping partners from the online venue.

H2: The difference characteristics of creating profile among HIV-negative have an influence on the probability of having sleeping partners from the online venue.

Testing the hypothesis, logistic regression was deployed as the dependent variable as a binary(yes/no) of having sleeping partners from the online venue and the independent variables are continuous.

H1: The difference characteristics of creating profile among HIV-positive have an influence on the probability of having sleeping partners from the online venue.

According to the data analysis, the Hypothesis1: The difference characteristics of creating profile among HIV-positive have an influence on the probability of having sleeping partners from the online venue is accepted. According to the logistic analysis showed the statistical significant of p-value 0.48, R-square 0.195. Whereas there are three types of creating profiles found to be a significant relationship of having sleeping partners from the online venue. Of those who are HIV-positive reported providing full name/ alias (*p-value 0.027*), providing age, body weight, height and chest circumference (*p-value 0.023*) and preserve their anonymity (*p-value 0.035*) have possibility of having sleeping partners from this venue almost twenty percent chance.

H2: The difference characteristics of creating profile among HIV-negative have an influence on the probability of having sleeping partners from the online venue.

From the hypothesis 2, the null hypothesis is rejected where the alternative hypothesis 2 is accepted with the statistically significant of p-value less than 0.05. However, it was found to be the different outcomes if comparing between the HIV-status. Of those who are HIV-negative and reported creating profile as followings: providing age, body weight, and height *(p-value 0.00*), provide personal contact (*p-value 0.014*), provide nothing but their profile picture(*p-value 0.001*), preserve anonymity(*p-value 0.000*) and other(*p-value0.000*) have possibilities of having sleeping partners from the online venue at approximately fifty percent chance.

4.3.2. Carrying the conversation

The participants respond to an open–end question on how conversation is carried based on their direct experience. The results showed different conversation patterns that have emerged. The following information was summarized into two groups according to the

context that they normally discuss at the beginning of the conversation. The results revealed the differences between two groups of participants. It was obviously seen that the majority of the HIV-positive participants reported they have a general conversation at the first conversation with online strangers whereas the majority of the counterpart reported they have a conversation related to sex content at the beginning of the conversation. The following table is illustrated the outcomes of how conversation is carried at the first start conversation.

Table11 the summary table of the conversation carrying compared between HIV-positive and HIV-negative participants.

Carrying the conversation	**HIV-positive (n=57) %(n)**		**Total**	**Coefficient**			**HIV-negative (n=71) %(n)**		**Total**	**Coefficient**		
	No	**Yes**		**Beta**	**t**	**Sig.**	**No**	**Yes**		**Beta**	**t**	**Sig.**
Start a general conversation	16.9(22)	26.9(35)	43.8(57)	0.432	3.255	*p<0.01* **	33.1(43)	23.1(30)	56.2(73)	0.638	11.376	*p<0.001**
Start a sexual related conversation	27.7(36)	16.2(21)	43.8(57)	0.701	5.282	*p<0.01* **	29.2(38)	26.9(35)	56.2(73)	0.744	13.258	*p<0.001**

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01,*

*p-value <0.001***, statistically significant at α = 0.001*

The example of the conversation is carried are concluded as the following sections;

The conversation related to sex:

"The conversation was initiated either by me sometime or other users, I would ask openly what are they looking for then I would decide whether I want to continue my conversation with them or not. Most of the time, I would say 95% of them are looking for sex only. So like I said it is easy to use and easy to get sex partners." PID002, HIV-status: positive, Aged 42 years old.

"I introduce myself first, my age and my current location. Most of the time If I approach who I like, I would introduce myself first then I would ask their name and location age and what are they looking for; sex, drug, serious relationship or just friends." PID095, HIV-status:Negative,Aged 20 years old

"I would rather start with kind of flirting conversation with some words that sounds horny to them." PID110, HIV-status:negative, Aged 26 years old.

"I am straight forwards and told them that I'm looking for sex only" PID145, HIV-status: negative, Aged 26 years old.

"Asking what are you doing. Are you insertive or receptive?" PID152, HIV-status:negative, Aged 18 years old.

"Looking for sex only and if agreed to have sex then we meet" PID178, HIV-status:negative, Aged 24 years old.

A General conversation:

"I generally start with a general conversation and sharing some common things or exchange some opinions towards various topics if we could carry on a long conversation, I might decide to give my personal contact or allow them to be my friends on Facebook, or instragram" PID118,HIV-status:negative,Aged 18 years old.

"I carry the conversation politely and I choose to have conversation with someone who seems to be polite" PID165, HIV-status:negative, Aged 20 years old.

"Just say hi and keep continue conversation" PID158, HIV-status:negative,Aged 22 years old.

Hypothesis Testing

Null hypothesis: The different of how online users carrying the conversation among HIV-positive and HIV-negative does not have an influence on the probability of having sleeping partners from the online venue.

H1: The different of how online users carrying the conversation among HIV-positive does have an influence on the probability of having sleeping partners from the online venue.

H2: The different of how online users carrying the conversation among HIV-negative does have an influence on the probability of having sleeping partners from the online venue.

Testing **H1:** The different of how online users carrying the conversation among HIV-positive does have an influence on the probability of having sleeping partners from the online venue.

According to the result of logistic regression analysis, the alternative hypothesis is accepted at the $p< 0.001$*** where the null hypothesis is rejected among the HIV-positive participants. The statistical results illustrated the significant at $p<0.01$*which means that of them who either carry the conversation related to sex or not related to sex, they have a possibility to have sleeping partners from the use at around thirty percent chance.

H2: The different of how online users carrying the conversation among HIV-negative does have an influence on the probability of having sleeping partners from the online venue.

The similar results are shown as the above tables from the statistical analysis. The result suggested that the null hypothesis was rejected where the alternative hypothesis 2 is accepted at $p<0.001$***, Which means whatever how they have a conversation they have a possibility to have sleeping partners form the use at 64 percent chance.

4.3.3. Posting photo

Posting photo is one of social media activities that generated the content virally. In this section, the participants were asked to provide in-depth information of how do they post their photo from their direct experience and how do they think about posting their own photo. The grouping technique was employed to analyze the qualitative information. The summaries are as followed.

Posting photo	HIV-positive (n=57) %(n)		Total	Coefficient			HIV-negative (n=71) %(n)		Total	Coefficient		
				Beta	t	Sig.				Beta	t	Sig.
	No	Yes					No	Yes				
Posting their own picture with a clearly face seen	23.1(30)	20.8(27)	43.8(57)	0.451	3.413	*p<0.01***	25.4(33)	30.8(40)	56.2(73)	0.607	11.224	*p<0.001****
Posting their own picture but blurry image	38.5(50)	5.4(7)	43.8(57)	0.257	2.29	*p<0.05**	54.6(71)	1.5(2)	56.2(73)	0.134	2.521	*p>0.05, ns*
Posting their shirtless body picture to show off their physique	34.6(45)	9.2(12)	43.8(57)	0.65	5.418	*p<0.001****	43.1(56)	13.1(17)	56.2(73)	0.484	9.031	*p<0.001****
Posting no photo	40(52)	3.8(5)	43.8(57)	0.196	1.735	*p>0.05, ns*	50.8(66)	5.4(7)	56.2(73)	0.409	7.602	*p<0.001****
Others	39.2(51)	4.6(6)	43.8(57)	0.175	1.53	*p>0.05, ns*	53.1(69)	3.1(4)	56.2(73)	0.313	5.865	*p<0.001****

From the above table, it is obviously seen that either HIV-positive or HIV-positive most likely to post their own photo that showing their clearly face. While the similar

outcomes were found that the they also reported posting their shirtless body image to show off their physique.

Hypothesis testing

Hypothesis Testing

Null hypothesis: The different of how online users posting their photo among HIV-positive and HIV-negative does not have an influence on the probability of having sleeping partners from the online venue.

H1: The different of how online users posting their photo among HIV-positive does have an influence on the probability of having sleeping partners from the online venue.

H2: The different of how online users posting their photo among HIV-negative does have an influence on the probability of having sleeping partners from the online venue.

Testing **H1:** The different of how online users posting their photo among HIV-positive does have an influence on the probability of having sleeping partners from the online venue.

The Null hypothesis is rejected where the alternative hypothesis 1 is accepted with a significant statistical p< 0.01**. Therefore, the different of how online users posting their photo among HIV-positive does have an influence on the probability of having sleeping partners from the online venue. However, of those who are HIV-positive with posting their photo with a clearly face seen *(p< 0.001***),* posting their own blurry photo *(p<0.05*)* and posting their shirtless body *(p<0.001***)* would have a possibility to have sleeping partners from online platform at a thirty percent chance.

H2: The different of how online users posting their photo among HIV-negative does have an influence on the probability of having sleeping partners from the online venue.

According to the alternative hypothesis 2 , the results suggested that the null hypothesis is rejected where the alternative hypothesis is accepted with significant statistical analysis (*p< 0.001***)*

4.3.4. Using a video function

Table 13 the summary table of posting VDO / VDO call function among two groups of participants

Posting VDO /VDO call	HIV-positive (n=57) %(n)		Total	Coefficient			HIV-negative (n=71) %(n)		Total	Coefficient		
				Beta	t	Sig.				Beta	t	Sig.
	No	Yes					No	Yes				
Content generator												
Uploading/posting VDO related to sex content to the public or followers	43.8(57)	0	43.8(57)				55.4(72)	0.8(1)	56.2(73)	-0.03	-0.535	*p>0.05, ns*
Sending VDO related to sex content to another users	43.8(57)	0	43.8(57)				51.5(67)	4.6(6)	56.2(73)	0.117	1.973	*p>0.05, ns*
Uploading/posting/generating live streaming to the public showing their normal daily basis activities	42.3(55)	1.5(2)	43.8(57)	0.334	3.068	*p<0.01***	51.5(67)	4.6(6)	56.2(73)	0.311	5873	*p<0.001****
Making a VDO call before meet in a person	36.9(48)	6.9(9)	43.8(57)	0.522	4.295	*p<0.001****	40.8(53)	15.4(20)	56.2(73)	0.58	9.806	*p<0.001****
Content followers/ consumers												
Just watching other users generate content	41.5(54)	2.3(3)	43.8(57)	0.135	1.219	*p>0.05, ns*	52.3(68)	6.2(8)	56.2(73)	0.05	0.922	*p>0.05, ns*
Not using any of this function even it is available	12.3(16)	31.5(41)	43.8(57)	0.51	3.998	*p<0.001****	27.7(36)	28.5(37)	56.2(73)	0.664	12.215	*p<0.001****

In this section according to how social media is utilized among MSM, video functions including video call are the features in applications that allow users generated online content in order to get feed backs. The results from this study revealed some of the participants' direct experience of how they use this function in the application that reported using. From the results, the information was grouped as followings

To compare the outcomes from the above table, it was found the similar outcomes that the majority of them not likely to use this function that available in the application. While there are the differences showed among the HIV-negative that they are more likely to be content generators than the HIV-positive. However, either HIV-positive or HIV-negative reported using a VDO call function before decided to meet in a person. This feature that is available in the application can ensure their trust and facilitate them to engage in having risky behaviors.

Hypothesis Testing

Null hypothesis: The different of how online users using VDO functions among HIV-positive and HIV-negative does not have an influence on the probability of having sleeping partners from the online venue.

H1: The different of how online users using VDO functions among HIV-positive does have an influence on the probability of having sleeping partners from the online venue.

H2: The different of how online users using VDO functions among HIV-negative does have an influence on the probability of having sleeping partners from the online venue.

Testing **H1:** The different of how online users using VDO functions among HIV-positive does have an influence on the probability of having sleeping partners from the online venue.

A statistic significant shows that how using various ways of VDO functions among the HIV-positive has an influence on the possibility of having sleeping partners from the online venue. Of those who are HIV-positive with using vdo as generating live streaming or VDO clip just during their daily basis activities(*p-value 0.003*), making a VDO call (*p-value 0.000)* and not using this function(*Sig p-value 0.00*) can have a possibility of getting sleeping partners from the online venue.

H2: The different of how online users using VDO functions among HIV-negative does have an influence on the probability of having sleeping partners from the online venue.

According to the alternative hypothesis 2, among the HIV-negative participants it was found to be an association between using different various ways of VDO functions can possibly allowing them to have chances of getting sleeping partners form online venue. Of those who are HIV-negative and using the VDO function as followings; Generate live streaming (*p-value 0.000*), making a VDO call (*p-value 0.000*) and not using this functions (*p-value 0.00*) can have possibility of getting sleeping partners from the online venue at 66 percent chance.

4.3.5. Time and Duration

In this study, the duration of time is defined as a period of time from an initiation of conversation to the time that they decided to meet in a person. The participants were asked to estimate duration of time they have spent with sex partners from online communication until making a decision to meet up offline from their direct experience. The followings are the data from the participants who are willing to response to this question.

Table 14 the summary table of time and duration spending on online between HIV-positive and HIV-negative.

Time and Duration spending on online conversation before meeting partners	**HIV-positive (n=57) %(n)**	**HIV-negative(n=73) %(n)**	**Total**	***p-value***
Never met	20(26)	8.5(11)	28.5(37)	
Within a day	3.8(5)	10(13)	13.8(18)	
2-3 days	6.2(8)	11.5(15)	17.7(23)	
A week	2.3(3)	5.4(7)	7.7(10)	
A few weeks	6.9(9)	4.6(6)	11.5(15)	
A month	1.5(2)	8.5(11)	10(13)	
More than a month	2.3(3)	2.3(3)	4.6(6)	
Can not specify exact duration, it depends on individuals	0.8(1)	5.4(7)	6.2(8)	
Total	43.8(57)	56.2(73)	100(130)	*p<0.01***

p-value<0.05, statistically significant at α = 0.05, p-value <0.01**, statistically significant at α = 0.01, p-value <0.001***, statistically significant at α = 0.001*

From the data outcome, it is interesting that among HIV -positive, they are not likely to meet their partners in a person but using online as normal routine however the HIV-negative participants found to be more likely to meet their partners via this venue. Specifically, the duration of a few days found to be the most suitable time to spend on online platform before decided to meet in a person among HIV-negative participants.

Further investigation in term of comparison between two different HIV-status, the test of independence between HIV-status and duration spending on the online conversation before meeting sex partners was tested by using Chi-square test. The

statistic result suggests that HIV-status has somewhat influence on the duration they spent on the online conversation *(p-value =0.002*, p-value <0.05)*. The obvious evidence is that the noninfected participants spent shorter time on online conversation that the infected participants which in some ways it can simply mean the noninfected have possibility to obtain greater number of sex partners than the infected MSM.

Chapter V

Conclusion, Discussion, and Recommendations

5.0 Conclusion

The purpose of this cross section study is to identify the pattern of social media use for sexual partners seeking by HIV-positive and HIV- negative men who have sex with men. The target population is Bangkok MSM aged over 15 who visit a research institute for consultancy. The data collection took 6 months from June to November 2018 and the subjects participating in this study total at 201.

The study found that the HIV-negative subjects are much younger than the HIV positive subjects. *Mean age* among HIV-positive group is 34.72 years old, *Median* is 33 year old with the *Std. Deviation* ± 11.78, *Minimum* is 15 and *Maximum* is 65. Comparing to *mean age* among HIV-Negative group which is 25.56 years old, the youngest age is 18 year old and the oldest age is 50 years old with the *Std. Deviation* ± 6.36. The research findings suggest that among two groups of participants, homosexual (both insertive and receptive) were indicated the most which were approximately 50% of them in each group. According to the difference of age between two groups, the occupation, therefore, is not share the same common. Among the infected group most of them are found to be freelancer while the non-infected are found to be students. There are also similarities and differences in their social media use. For example, the HIV-positive and the HIV-negative respondents tend to rely on one dating application alongside several other mainstream social media apps, and it is less likely for them (HIV-positive) to use multiple applications at the same time, which is the opposite for the HIV-negative population, who enjoying being active on multiple applications, most of which are mainstream social media applications with at least one dating application. Among two group of participants, the dating application named “Hornet” was the most popular application in order to use as a venue to find sleeping partners followed by general application; Facebook. Reasons are found to be the application is easy to use (user-friendly).In the other meaning of easy to use , some participants implied that it was easy to start the conversation related to finding sleeping partners.

The study also investigates risky sexual behavior associated with their online activities including the number of sleeping partners obtained, condom use, sexual orgy experience, as well as alcohol and drug based stimulants. The study was intended to investigate risky sexual behaviors among application users who met sleeping partners from the online venue. The results showed the proportion of social media use among two groups, more than two third of the infected reported using social media while only approximately half of the non-infected reported using this venue. In the contrary, even though the proportion of choosing online venue as a platform among infected group is higher than non-infected group, the risky sexual behaviors was found to be at risk among non-infected group. 86.3 percent of non-infected group who are online users reported have sleeping partners from the online venue while the report from the infected group was only 54.4 percent of having sleeping partners from using online applications. The results from this study also found that of those who are online users, non-infected group tend to have higher number of sleeping partners than infected group. The study also revealed that non-infected reported having sleeping partners who are sex workers while none of the infected reported having this type of sleeping partners.

Comparing the rate of condom use among two groups, although the results seem to suggest that the non-infected group were more likely to have riskier sexual behaviors, it was interesting if considered in the aspect of having higher number of sleeping partners from the online venue, but if considered in the aspect of condom use, the differences were found in the opposite direction. It was found that less than fifty percent of the infected always use condom (100% condom use) while approximately two third of the non-infected always use condom. It was surprisingly found that the infected still having some of the online users reported never used condom during having sexual activities. On the other hand, in the aspect of using alcohol before having sex activities, the non-infected group were tended to report in the higher number than the infected group. Considering on using drugs in terms of sexual stimulants for example Viagra and popper, it was found the number of HIV-negative reported using them higher than the counter part while the illicit drugs as defined as drugs that have an effects on consciousness such as ice, ectacy, methamphetamine etc., the results from the study found that some of the HIV-negative reported using them sometimes before having sex

while only one of the HIV-positive experienced using it before having sex with sex partners who met online.

To summarize how online applications were utilized among MSM, of those who are online users have their own ways to approach strangers and end up with making a decision to meet in a person. However, the results from this study showed the variety of the patterns of using online social media in order to find sleeping partners. The findings also suggested with whatever reasons that motivate them choosing any application regardless of HIV-status they absolutely have possibility to get sleeping partners from the online venue. Other suggestions from the results of the study in terms of how online social media use. Of those who are online users regardless of their HIV-status, to create their profile whether they disclose their information or not they still having a possibility of having sleeping partners, whereas whatever conversation that they have would related to sex content or not, they have possibility of having chance of getting sleeping partners. In the similar context, regardless of they revealed their identity or not, still have chance of getting sleeping partners which means they have possibilities of engaging in having risky sexual behaviors later.

5.1 Discussion

The results from this study appear to correspond with studies conducted by Boonchutima and Kongchan (2017) and Boonchutima and Sriwattana (2016) in several aspects. First, in terms of the pattern of social media use, this study found that the age at which most of the MSM begin using social media to seek partners is between 15 and 40 years, similar to the 2017 study, which reported that 75% of the MSM began using social media channels to obtain sleeping partners when they reach the age of 18 years.

However, there are some aspects that the findings of this study appear to contradict what have been discovered by others. Perhaps, the most significant is the level of sexual risky behavior found between Thai and American populations. Based on the data Chiu and Young (ChingChe J. Chiu and Sean D. Young, 2015) collected from American MSM, HIV-positive app users displayed a higher degree of sexual risky behavior. The previous study(ChingChe J. Chiu and Sean D. Young, 2015) found a

higher number of sleeping partners obtained from online social media by the HIV-positive users (10.2) than by the HIV-negative counterparts (3.2). They also reported that the number of one-time sexual partners obtained by the HIV-positive is considerably higher than that obtained by the HIV-negative (9.54: 2.47). In contrast to the 2015 study, the researcher of this study found a reverse pattern. It turns out that populations that display a higher degree of sexual risky behavior are the HIV-negative. This assertion is statistically supported by the higher number of sex partners that the HIV negative obtained from their online methods, not to mention that some of their partners were sex workers. This type of risky behavior was, however, not found among the HIV-positive populations. One possible explanation of this could be attributed to health education and treatment that the HIV-positive participants of this study receive from a research institute, which influences their attitudes making them more conscious about the transmission of their disease. The HIV-negative subjects, on the other hand, show lack of HIV prevention awareness. Only 47 percent of the negative subjects receive regular HIV-testing. Some of the negative populations find the way to prevent themselves by reporting taking PEP or PrEP in cases that they evaluated the risk situations themselves and visited the clinic to ask for receiving medicine. Other than that, the study also found inconsistent use of condom and failure to receive HIV blood test. These risky sexual behaviors as displayed by the negative populations should raise a concern and call for steps to be taken to prevent them from contracting HIV as a result of their risky sexual lifestyle. Other areas where dissimilarities emerge can also be found in the popularity of dating applications used by the MSM to seek sex partners found in this study and that by Boonchutima(2016). While the latter study shows that Jack'D was at the time a dating application with the highest number of users, the researcher of this study found a shift in the popularity towards Hornet.

Regardless, this study has shed further light on the pattern of social media use, which has been the focus of both of Boonchootima's studies(Boonchutima S. and Sriwattana S., 2016; Boonchutima S., 2017). For example, while the previous studies have provided valuable statistical data regarding place, time and frequency of use, this study further revealed how the types of activities change with respect to time. To put into perspective, the types of activities that take place before midnight are generally

innocent and harmless but after midnight activities that contain elements of sex and drug use begin to emerge. However, the results of this study help to paint a clearer picture regarding the MSM's pattern of social media use, which has for a very long time been investigated using quantitative data. For example, while Boonchutima's study suggests that the average time spent on the apps is 20 minutes or more, this study shows that when taking into account both the online conversation and arrangement for face-to-face meeting, the entire process can take only within a day up to more than a month which depend on personal's lifestyle and daily basis. Moreover, one of the factors that alleviates online users to have shorter period of duration spent on online conversation until arrangement for face-to-face meeting was places during they were online. In addition to this, it was also found that the closer the potential partners are to the app users at the time when they are actively searching for partners, the less is spent on online conversation and more on offline activities.

With regard to reasons for choosing a dating app, the study found that users are more likely to choose the application that offers user-friendly interface, requires no personal information, and runs stable on their mobile devices. However, another for choosing an app also involves the popularity status. As popular app tends to have a larger number of users, and the larger the number of users means a greater chance of finding a match. As it turns out, the application that appears to satisfy all these criteria is Hornet, which perhaps explains the reason why it was the most used dating application by the subjects surveyed.

Due to a strong competition among developers who target LGBT users, many dating applications have been augmented with increasingly more innovative features. *Blued* is an example of the modern dating apps that showcase live streaming. With crypto-currency based rewarding system, the users feel encouraged to generate and participate in live video content to receive rewards that come in the form of privileges associated with their virtual wealth status. Interestingly enough, the study shows that Blued was used only by a minority of the subjects whose reason for using the app is to view other people's live video streaming. None of the subjects who used Blued report having been a content generator or having obtained sleeping partners from the application use. So, this might suggest that the effort to encourage user participation

could possibly lead the users away from partner-seeking purpose but rather to pleasure from viewing other people's content.

The subjects' primary reason for using general social media applications is their perceived sense of safe community, as they will most of the times be sharing content with people whom they know from their real-life social groups. Users of the general apps are also less likely to take such risk as seeking a one-time sleeping partner but more inclined to search for serious relationship. They also feel that the content generated by users of the general social media platforms are more credible and less malicious than dating sites. Moreover, the study also found that dating applications save the users' time for ice-breaking, and when used in bundle it can increase the chance of finding a match.

According to the chaotic results of comparing risky sexual behaviors among online users in both groups, there are several reasons that could possibly explain the phenomenon. In terms of using condom, as it was mentioned earlier that the infected found to be less likely to use condom 100%, as it was found that the sex position which the infected group reported mostly were both and receptive. The possibilities are they were mostly in the receptive position that was passively inserted by their partners therefore their partners were supposed to use condom instead. While another contrary result among the two group was using alcohol before having sex, it is possible that of those who are infected need to regularly take the ARVs medicine which they are aware of side effects if they drink alcohol therefore it resulting in less drinking alcohol among the infected group while the non-infected group find that it is normal to hang out and drinking is the part of entertainment activities where they can enjoy or learn their partner's lifestyles and attitudes before they decided to end up with sex activities. Therefore, to be concluded that drinking among the non-infected is considered to be the engaging activities before having sexual activities.

5.2 Limitations and Reflections

The number of participants was relatively small; therefore, the results of this study could not be generalized for the total population of this particular population. Another concerning limitation is involving sampling bias regarding to the sampling

technique was purposive random sampling, however, the researcher is concerned on the issue.

There are several limitations and obstacles faced by the author throughout the process of data collection. The first issue concerns the number of participants. During the first phase of data collection, only 155 subjects agreed to participate in the survey, which was much less than the calculated sample size. To make matters worse, some of the participants were not able to meet with the researcher as initially agreed, which resulted in the amendment of the protocol in which the target population consequently had to include HIV-negative MSM to compensate for the loss of the HIV positive participants.

Another major obstacle is the participants' refusal to answer some questions they considered too sensitive. As a result of that, the data collected were not as complete as they should be. However, it is a participant's right to refuse to answer any questions if they do not want to answer and they have right to discontinue from the study anytime during any session the questioning was conducted.

In this study, the limitation was also mentioned about having only the risky behaviors among online users while those who reported have not used online as a platform to find sex partners were not assessed their off-line risky sexual behaviors.

5.3. Recommendations for Future Research

The author found that the benefit of the results could be another piece of an evidence-based for the public health involving in HIV/AIDS prevention and reductions in Thailand. A part from proactive preventive strategies in the community, engaging risk population from the online venue should be considered. For further recommendations, preventive strategies should be emphasized on the online venue. It is true that nowadays many websites are providing very useful and helpful information related to HIV prevention and treatment. However, to access those websites, those people have awareness to seek for information either for preventing

themselves or receiving treatment in the other word some of them are possibly having a difficult time dealing with they risk situation that they have been through. Therefore, it is the time for them to sort out for the information. On the other hand, the preventive strategies should be recommended to emphasize on providing the helpful information in the right venues such as instead of providing the helpful information on their own websites, providing the channels to reach for the useful information in the risky online platforms especially dating applications. Another similar suggestion from the study is reaching target risky population from the online community where a lot of them are involved. It is undeniable that through online platforms sensitive issues; sex, violence, drugs are more comfortable to be discussed. The possibility is because of the confrontation. Especially, Thai people, the influences of Thai people to discuss with sensitive issues are culture and social norms, the less confrontation they faced, the more they are open to discuss in the sensitive issues. Moreover, especially homosexual in our society is still considered to be different from other in many people's point of views. Therefore, many of those who are homosexual need to obscure their status and their behaviors from the society. For further suggestions, the preventive strategies should be considered to implement from supporting the homosexual group to live healthier and less risky which ranging from family support, school support, up to society and national policy. To involve in helping the risky population, many sectors should be concerned. Among health care professional sectors, especially who are working in the HIV/AIDS area, using dating applications among young teenagers or risk population is a concerning issue. Health education session for risk population should be considered accordingly to their HIV-status, referring to the results of this study which shows differences of the outcomes

in terms of using social media in various ways and different degree of risk. It is considerably to include and emphasize on the utilization of online social media along with condom use, alcohol use, drugs use, receive STDs testing and a recommendation of taking PrEP or PEP among risk population. Recommendations for further studies are suggesting to further investigate on health behaviors among MSM who online users the issues are especially involving serosorting among online users, PrEP taking or factors influence decisions of receiving PrEP or PEP among the risky MSM populations.

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