

Perceived social support, stigma, and sexuality problems among adult HIV-positive patients

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Abstract

Title: Perceived social support, stigma, and sexuality problems among adult HIV-positive patients.

Background: Social support, stigma, and sexuality problems are of great interest for people living with HIV (PLWH) and their quality of life. Healthcare providers (HCP) play an important role in the care of PLWH. To fulfil this role, HCP need to discuss social support, stigma, and sexuality problems during routine care consultations; therefore insight in how these themes are perceived in PLWH is necessary.

Aim: This study aims to gain insight in the levels of social support, stigma, and sexuality problems of Dutch outpatient PLWH. The secondary aim is to examine differences in subgroups within the Dutch HIV population regarding social support, stigma, and sexuality problems.

Methods: This cross-sectional study used an online survey. Multiple regression analyses were conducted with social support, stigma and social support as outcome variables.

Results: 204 PLWH participated in this study. A lack of social support and high levels of stigma and sexuality problems were observed. Regression models including patient characteristics showed that unemployment, relation status, educational level, HIV-age and sexual behaviour were significant predictors for social support, stigma or sexuality problems.

Conclusion: The perceived lack of social support and high levels of stigma and sexuality problems confirmed that these themes should be topic of discussion during outpatient consultations. Although, different patient characteristics associated with social support, stigma and sexuality problems, the explained variance of the regression models were low; hence no meaningful differences between subgroups were found.

Implications: Further research on what interventions are suitable to improve the perceived social support, stigma and sexuality problems for PLWH is recommended. Studies on which factors affects these themes and qualitative research to gain a deeper understanding can make an important contribution.

Keywords: human immunodeficiency virus (HIV), quality of life, social support, stigma, sexuality

Samenvatting

Titel: Ervaren sociale steun, stigmatisering en seksualiteitsproblemen bij volwassen HIV-positieve patiënten.

Achtergrond: Sociale steun, stigma en seksualiteitsproblemen hebben een grote invloed op het kwaliteit van leven van HIV-patiënten. Zorgverleners hebben een belangrijke rol in de zorg voor HIV-patiënten. Om deze rol te vervullen, dienen zorgverleners sociale steun, stigma en seksualiteitsproblemen bespreekbaar maken tijdens poliklinische consulten. Om deze reden is inzicht nodig in hoe deze thema's worden ervaren bij HIV-patiënten.

Doel: Het doel is om inzicht te krijgen in de mate van sociale steun, stigma en seksualiteitsproblemen bij Nederlandse HIV-patiënten. Het secundaire doel is het onderzoeken van verschillen in subgroepen in de Nederlandse HIV-populatie met betrekking tot sociale steun, stigma en seksualiteitsproblemen.

Methode: Deze dwarsdoorsnede studie maakte gebruik van een online vragenlijst welke is afgenomen bij HIV-patiënten. Er zijn multiple regressie analyses uitgevoerd met sociale steun, stigma en seksualiteitsproblemen als uitkomstvariabelen.

Resultaten: 204 patiënten namen deel aan de studie waarbij een gebrek aan sociale steun en hoge scores op stigma en seksualiteitsproblemen is waargenomen. De regressiemodellen inclusief de patiënten karakteristieken lieten zien dat relatie- en werk status, opleidingsniveau, seksuele activiteit en HIV-leeftijd van invloed zijn op sociale steun, stigma en seksualiteitsproblemen.

Conclusie: De resultaten bevestigen dat sociale steun, stigma en seksualiteitsproblemen besproken dienen te worden tijdens poliklinische consulten. Ondanks dat verschillende patiënten karakteristieken significant waren voor sociale steun, stigma en seksualiteitsproblemen, waren de verklaarde varianties van de regressiemodellen zodanig laag dat er geen betekenisvolle verschillen tussen subgroepen zijn gevonden.

Aanbevelingen: Er wordt aanbevolen dat vervolgonderzoek zich richt op welke interventies passend zijn om de ervaren sociale steun, stigma en seksualiteitsproblemen van HIV-patiënten te verbeteren. Daarnaast kan kwalitatief onderzoek naar welke factoren van invloed zijn een belangrijke bijdrage leveren om een dieper inzicht te krijgen van deze thema's bij HIV-patiënten.

Sleutelwoorden: humaan immunodeficiëntievirus (HIV), kwaliteit van leven, sociale steun, stigma, seksualiteitsproblemen

Introduction

Despite the decrease in human immunodeficiency virus (HIV) infections worldwide, a total of 38 million people are living with HIV (PLWH) worldwide and 1.7 million people were newly infected with HIV in 2019¹. In the Netherlands, 24,000 people were HIV positive in 2019, approximately 64% of which were men who have sex with men (MSM)^{2,3}.

In the 1980s, HIV was characterised as a severe and lethal disease caused by sexual transmission and intravenous drug use⁴. Nowadays, owing to the implementation and improvement of antiretroviral therapy, HIV is characterised as a chronic disease rather than a lethal disease⁴⁻⁶.

Chronic diseases, such as HIV, severely affects the quality of life and mental health of PLWH⁷⁻¹⁰. Themes that are considered important for the quality of life of PLWH are social support, stigma, and sexuality problems; previous research on PLWH demonstrates that stigma, sexuality problems, and a lack of social support are often experienced and compromise the quality of life of PLWH¹¹⁻¹⁵. Social support, stigma, and sexuality problems also seem to be very closely related in practice; stigma may negatively impact happiness, self-esteem, sexual and social relationships and the sense of purpose among PLWH^{12,15}. Although, previous studies have demonstrated the great interest of social support, stigma, and sexuality problems for PLWH, in clinical practice social support, stigma, and sexuality problems are not a topic of discussion between healthcare providers (HCP) and PLWH during routine outpatient care consultations¹⁶. This finding may be explained by a lack of time, experienced barriers, and prioritising other themes, such as medical conditions, laboratory results, sexual risk behaviour, and perceived side effects¹⁶⁻²⁰.

Healthcare providers play an important role in the care of PLWH²¹. In this study, the term HCP is used for HIV nurses and infectiologists. The role of HCP accompanying PLWH includes assessing, discussing, following-up, and deploying interventions regarding a patient's perceived social support, stigma, and sexuality problems¹⁷. To be able to fulfil this role, HCP need to discuss social support, stigma, and sexuality problems during routine care consultations; therefore, an insight into the perceived social support, stigma, and sexuality problems is necessary. Additionally, having an insight into the perceived social support, stigma, and sexuality problems of different subgroups within the HIV population may be beneficial for HCP in tailoring care to fully meet individual needs during routine outpatient care consultations.

Aim

This study aims to gain an insight into the levels of social support, stigma, and sexuality problems of outpatient patients with HIV in the Netherlands. The secondary aim is to examine differences among subgroups within the Dutch HIV population regarding the three themes. The findings may help HCP to tailor their HIV care to a patient's individual needs during routine outpatient consultations.

The first hypothesis of this study is that social support, stigma, and sexuality problems are interrelated among PLWH^{12,15}. The second hypothesis is that subgroups such as MSM and religious PLWH perceive more stigma and sexuality problems, and less social support than other subgroups of PLWH, owing to the stereotyping that still prevails among PLWH^{22,23}.

Method

Design

A quantitative cross-sectional study design using an online survey was employed to study social support, stigma, and sexuality problems among PLWH. A cross-sectional study design was appropriate because the assessment of social support, stigma, and sexuality problems among PLWH occurred at one fixed point in time²⁴.

Setting and population

An HIV outpatient clinic of a Dutch general metropolitan hospital participated in this study. The study population included adult patients with HIV who received outpatient HIV care semi-annually from their HCP.

Patients aged 18 years and older and with an HIV-positive diagnosis were eligible.

The online version of the survey was not available in English. Owing to the Covid-19 pandemic, patients temporarily did not visit the outpatient clinic. Considering patient privacy, the paper version of the survey in English could not be sent and administered. Therefore, patients who were not proficient in the Dutch language were excluded.

Procedures

The online survey was used for routine care. In addition, patients were asked for consent for using the data for research purposes. Patients who had an outpatient consultation during the study period were informed by telephone by their HCP about this study during their consultation.

All these patients received an SMS with a link to the online survey. With this link, patients were invited to login to their patient portal with their DigiD (Dutch digital identification). Through the link, patients received more information about the study and were requested to provide consent for the data to be used for research purposes.

Measures and outcomes

The measures of social support, stigma, and sexuality problems were obtained using a set of questionnaires developed by Daas et al.²⁵. This set of questionnaires represents eight themes that encompass health related quality of life among PLWH, including: quality of life, stigma, social support, self-esteem, sexuality problems, anxiety and depression, sleeping difficulties, and perceived side-effects. The themes included in the questionnaire had substantial internal consistency; Cronbach's Alpha between .69 and .90^{25,26}.

For this study, the overall scores of social support, stigma, and sexuality problems were used. The set of questionnaires included the 12-item abbreviated version of the Social Support List-Interaction with good psychometric properties (SSL-12-I) to assess social support^{25,27,28}; the 12 items were rated on a 4-point Likert scale. A 10-item abbreviated version of the Berger Stigma scale was included to study participants' perceptions about stigma^{25,29,30}; the 10 items were rated on a 4-point Likert scale. Questions about sexuality problems were adapted from the Natsal-SF scale³¹, and participants were questioned about their perceptions on sexuality problems in 8 items rated on a 5-point Likert scale. The levels of social support, stigma, and sexuality problems were expressed on a continuous scale by adding participants' responses on the Likert scale per item.

Data collection and management

Data was collected between October 2020 and March 2021 and stored in the patients' medical records, to be able to use the outcomes during routine consultations.

The data was obtained anonymously from the medical records for the purpose of this study, including patient characteristics such as gender, age, HIV-age (number of years lived with HIV), marital status, education level, work status, sexual identity, sexual behaviour, and religion. These patient characteristics were suitable for this study because they can distinguish subgroups within the HIV population, and the hypothesis based on clinical practice is that these characteristics or subgroups may be associated with social support, stigma, and sexuality problems.

Data analysis

Data analysis was performed using descriptive statistics followed by multiple regression analyses. The levels of social support, stigma, and sexuality problems, and patient characteristics were descriptively analysed. Continuous variables were presented as means and standard deviations. For categorical variables, frequencies and percentages were reported.

To interpret the mean levels of social support, stigma, and sexuality problems, ranges and cut-off scores were used. Total scores ranged from 12 to 48 for social support, from 10 to 40 for stigma, and from 8 to 40 for sexuality problems. Cut-off scores of >19 were considered alarming for stigma and sexuality problems²⁵. For social support, the cut-off score of <26 was considered alarming²⁵.

The multiple regression analysis was performed three times; one of the three themes was considered as the dependent variable per analysis.

To examine differences among subgroups within the Dutch HIV population regarding social support, stigma, and sexuality problems, patient characteristics were used as predictors in multiple regression analyses per theme. All performed multiple regression analyses were performed using the 'enter' method, which enters all predictors into the regression equation at the same time. This method was appropriate because there was no basis for considering any particular predictor as causally prior to another^{24,32,33}.

According to Stevens' rule of thumb³⁴, categorical variables were merged when the frequency of a category was <15. The categories of the variable education level met this rule of thumb and was recoded into dummy variables. The bi-sexual category did not meet this rule; however, this category could not be merged with heterosexual or homosexual. All other categorical variables did not meet the rule and were thus presented as follows: marital status (relationship and no relationship), work status (employed, unemployed, and retired) religion (no religion and religion), and sexual behaviour (sexually active and not sexually active).

In the Netherlands, there is an association between education level and work status³⁵.

Therefore, a second regression model included the dummy variables of the interaction between education level and work status. In addition, dummy variables of the interaction between marital status and sexual behaviour were included in the second regression model; in general, being sexually active is more likely when a person is in a relationship³⁶.

The assumptions for performing a multiple regression analysis were assessed using a histogram, variance inflation factor (VIF), and a P-P plot^{24,37}; a VIF ≤ 4 was considered acceptable³⁸.

The adjusted R-squared, standardized β , and 95% confidence interval were used to examine the strength of the independent variables. There were two cases with missing data; however,

no imputations were made because the number of missing data was within the acceptable range^{24,39}. Therefore, cases with missing data were excluded.

Statistical analyses were executed using the IBM Statistical Package for Social Sciences (version 25). A p-value of < .05 was considered statistically significant.

Sample size

To calculate the required sample size for performing a regression analysis, the G*Power (version 3.1.9.7) program was used⁴⁰. No previous studies presenting information about the estimated explained proportion of the variance were found. Therefore, a moderate effect size (f^2) of .15 was used^{24,41}. When using nine patient characteristics as predictors, a minimum sample of 166 patients was required (power = .95, α = .05, f^2 = .15).

Ethical considerations

This study was conducted according to the principles of the Declaration of Helsinki⁴² and the Medical Research Ethics Committee United (MEC-U). The study was acknowledged as non-Medical Research Involving Human Subjects Act (number W21.032). All data was treated according to the General Data Protection Regulation.

Results

Descriptive statistics

Participants and patient characteristics

Approximately 625 patients had an outpatient consultation with their HCP during the study period. In total, 206 (33.0%) patients provided consent for the data to be used in this study and met the inclusion criteria. Missing data concerned work status (N = 1) and sexual identity (N = 1). Finally, a total of 204 surveys were used for analysis. Table 1 represents the patient characteristics of the study sample. The study sample was predominantly male (85.3%), homosexual (62.7%) and sexually active (87.3%). The mean age was 48.0 ± 12.0 years, and the mean HIV-age was 11.0 ± 7.3 years.

[Insert Table 1]

Social support, stigma, and sexuality problems

To gain insight into the level of social support, stigma, and sexuality problems, these themes were descriptively analysed. The mean levels were 29 for social support, 21 for stigma, and 19 for sexuality problems. These levels were close to or exceeded the cut-off points, as shown in Table 2.

[Insert Table 2]

Regression analyses

To explore associations between social support, stigma, and sexuality problems, multiple regression analyses were used. Assumptions for multiple regression analyses were met^{24,37}. Multiple regression analyses found associations between social support, stigma, and sexuality problems. Sexuality problems were associated with stigma ($\beta = .431$; $p \leq .000$) and social support ($\beta = -.270$; $p \leq .000$). A high sexuality problems score increased the stigma score and decreased the social support score. Additionally, both social support ($\beta = -.224$; $p \leq .000$) and stigma ($\beta = .407$; $p \leq .000$) were associated with sexuality problems, as shown in Table 3.

[Insert Table 3]

To examine differences within Dutch HIV subgroups regarding social support, stigma, and sexuality problems, patient characteristics were used in multiple regression analyses per theme. The results per theme are presented below.

Social support

Significant results for social support were observed for low education level, unemployment, and sexual behaviour (Model 1, Table 4). Patients with a low level of education had a significantly lower social support score than highly educated patients ($\beta = -.153$; $p = .044$). Being unemployed resulted in a lower social support score than being employed ($\beta = -.236$; $p = .001$). Social support scores were significantly lower in not sexually active patients than sexually active patients ($\beta = -.200$; $p = .005$).

After including the interaction terms, a significant association was observed for low social support in unemployed patients with a low level of education compared with highly educated and employed patients ($\beta = -.330$; $p \leq .000$; Model 2, Table 4). Social support scores in unemployed patients with an middle ($\beta = -.084$; $p = .048$) or high ($\beta = -.168$; $p = .020$) level of education were significantly lower than those in highly educated and employed patients. The

percentage of explained variance was 12.9% in Model 1, and 13.8% in Model 2, which indicates that 13.8% of the variation in social support was explained by the included variables

[Insert Table 4]

Stigma

The variables HIV-age, relationship status, and unemployment had a significant impact on stigma score (Model 1, Table 5). Stigma decreased significantly with increasing HIV-age ($\beta = -.195$; $p = .009$). Patients who were not in a relationship had significantly higher stigma scores than patients in a relationship ($\beta = .210$; $p = .002$). The stigma score was higher for unemployed patients than employed patients ($\beta = .194$; $p = .006$). After including the interaction terms, highly educated and unemployed patients showed higher stigma scores than highly educated and employed patients ($\beta = .161$; $p = .024$), as shown in Model 2, Table 5. Additionally, patients who were not in a relationship and were sexually active had a higher stigma score than patients who were in a relationship and were sexually active ($\beta = .216$; $p = .003$). The percentage of explained variance was 13.3% in Model 1 and 13.7% in Model 2, which indicates that 13.7% of the variation in stigma was explained by the included variables.

[Insert Table 5]

Sexuality problems

There was a significant association between relationship status and sexuality problems and between unemployment and sexuality problems, as shown in Model 1 (Table 6). The sexuality problems score was higher for patients who were not in a relationship than patients who were in a relationship ($\beta = .180$; $p = .012$). Unemployed patients had significantly higher sexuality problems scores than employed patients ($\beta = .189$; $p = .009$). After including the interaction terms, a significant association was observed for sexuality problems in highly educated, unemployed patients ($\beta = .181$; $p = .015$; Model 2, Table 6). Sexually active patients who were not in a relationship had significantly higher sexuality problems scores than sexually active patients who were in a relationship ($\beta = .195$; $p = .009$). In addition, not sexually active patients who were also not in a relationship had higher sexuality problems scores than sexually active patients who were in a relationship ($\beta = .172$; $p = .017$). A less significant association was found for patients who were in a relationship and were not sexually active ($\beta = .146$; $p = .048$). The percentage of explained variance in both

models was 7.2%, which indicates that 7.2% of the variation of sexuality problems is explained by the included variables.

[Insert Table 6]

Discussion

This study aimed to gain an insight in the levels of social support, stigma, and sexuality problems of Dutch outpatient PLWH and aimed to examine differences in subgroups within the Dutch HIV population regarding social support, stigma, and sexuality problems. The main findings this study revealed that PLWH perceive a high level of stigma, sexuality problems, and a lack of social support. Furthermore, this study found that subgroups in the HIV population such as low-educated, unemployed, not sexually active, and single patients are associated with social support, stigma, or sexuality problems.

This study found that sexuality problems were interrelated with stigma and social support. Bourne et al.¹⁵ confirms this finding between sexuality problems and stigma; “tackling HIV-related stigma would help to improve sexual interactions”. No previous studies were found to conform or contradict the association between sexuality problems and social support.

This study did not find a significant association between social support and stigma, which contradicts the findings of Yan et al.⁴³ and Li et al.⁴⁴ who found significant associations between stigma and social support. Both studies suggested that depression is an underlying factor for the association between stigma and social support.

Unemployment, including patients who were declared unfit for work, was associated with social support, stigma, and sexuality problems. A possible reason for patients being declared unfit for work is depression. According to several studies, HIV-related stigma and social support are directly associated with depression⁴³⁻⁴⁶. Thus, depression may be an underlying factor for this association as well.

Being unemployed and highly educated was associated with higher perceived stigma and sexuality problems. This finding contradicts the findings of other studies that suggest that a low education level is associated with stigma^{47,48}. Subedi et al.⁴⁹ suggests that the association between stigma and high education level “might be due to perceived susceptibility and perceived severity of stigma and fear of abandonment”.

The present study also revealed that HIV-age was associated with stigma; the longer someone lived with HIV, the less stigma they perceived. This corresponds with the results of a previous cohort study by Steward et al.⁵⁰ and a mixed-methods study by van Bilsen et al.⁵¹. Patients who were not in a relationship had significant higher scores on stigma and sexuality problems. This indicates that PLWH who perceived stigma may be reluctant to enter into a relationship. According to van Bilsen et al.⁵¹, PLWH face difficulties in initiating sex and are

less likely to enter into a relationship. Therefore, it is possible that, in addition to not entering a relationship, these patients are not sexually active; this association was confirmed by the regression model of sexuality problems in the present study. This finding may be explained by the fact that PLWH are afraid of being rejected because of the stigma that still prevails, transmitting HIV, and contracting another sexually transmitted infection^{15,22,23,51}; it can be assumed that PLWH seem to find themselves in a vicious circle.

Contrary to the hypothesis, this study did not find an association between MSM, religious PLWH and social support, stigma, or sexuality problems. Society often stereotypes PLWH as homosexuals, promiscuous persons, sex workers, or drug users, who are often classified as immoral according to religious codes^{22,23}. This indicates that MSM and religious patients experience stigma. An explanation for the lack of this association in the present study may be that patients who were not mastered the Dutch language were excluded. It can be assumed that these excluded patients generally have a different ethnic background than native Dutch PLWH with a culture or religion associated with it.

Strengths and limitations

To interpret the findings of this study, the strengths and limitations need to be considered. A strength of this study is that this is, to our knowledge, the first study to explore sexuality problems among PLWH. Most studies regarding sexuality among PLWH focus on sexual risk behaviour, HIV transmission and prevention, and MSM⁵²⁻⁵⁴. Therefore, the findings regarding sexuality problems add value to the current literature. Additionally, to our knowledge, this is the first study to explore an extensive set of patient characteristics to distinguish subgroups in the HIV population regarding social support, stigma, and sexuality problems. Furthermore, the study population was predominantly male and homosexual. This is consistent with the current data on the HIV population in the Netherlands³, suggesting that the study population is representative of the Dutch HIV population.

A limitation, however, is that the mean age of the national HIV population may be higher than of the study population. Owing the Covid-19 pandemic, the survey was administered online. It is possible that elderly patients were unable to complete the online version of the survey. In addition, the Covid-19 pandemic may have led to the moderate response rate (33%) of this study compared to other HIV studies using online surveys^{55,56}. However, the response rate of this study was based on the estimated total patients that had an outpatient consultation during the study period. This total was including patients who were not proficient in the Dutch language who were not approached for this study. Therefore, the response rate is expected to be higher in reality. Moreover, excluding patients who were not proficient in the Dutch language limits the generalizability of the study results.

The study design has its limitations; although a convenience sampling method was most suitable in this study, it can harbour bias even with a large sample size²⁴. In addition, this study was cross-sectional; therefore, causation cannot be inferred⁵⁷.

Although the number of patients included in the study was adequate to fulfil the required estimated sample size, the data in each category of variables were insufficient to perform a multiple regression analysis. Therefore, variables were merged according to Stevens' rule of thumb to ensure that the results were reliably interpreted³⁴.

Furthermore, the explained variances were low in all regression models, which indicates that social support, stigma, and sexuality problems are explained by other factors. Underlying factors may be anxiety and depression; several studies among PLWH showed associations between anxiety, depression, stigma, social support and quality of life^{43,45,46,58,59}.

Implications for clinical practice and future research

The study results demonstrated low explained variance for social support, stigma, and sexuality problems, which indicates that other factors affect these themes. Future research need to focus on which factors affect these themes; it is recommended to include anxiety and depression as a factor in future research, because it is hypothesized that depression affect social support, stigma and sexuality problems. Secondly, future studies should focus on which interventions are suitable to decrease the perceived stigma and sexuality problems, and increase the level of social support for PLWH.

The results suggest that there PLWH may find themselves in a vicious circle; qualitative research is recommended to gain a deeper insight into this potential vicious circle.

Conclusion

This study revealed that Dutch outpatient PLWH perceive high levels of stigma and sexuality problems, and a lack of social support. This confirms that these themes should be a topic of discussion during outpatient consultations between HCP and PLWH. Additionally, this study confirmed the hypothesis that sexuality problems were associated with social support and stigma. However, this study did not confirm an association between social support and stigma.

Contrary to the hypothesis, subgroups of the HIV population, such as MSM and religious patients, did not perceive more stigma and sexuality problems and less social support than other subgroups of PLWH. Although, different patient characteristics were associated with social support, stigma, and sexuality problems, the percentage of variance explained by the regression models was low; therefore, no meaningful differences were found among HIV subgroups.

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Tables and figures

Table 1

Patient characteristics of the study sample (n = 204)

Age in years, mean \pm SD	47.67 \pm 12.0
HIV age, years, mean \pm SD	11.37 \pm 7.3
Gender, <i>n</i> (%)	
Male	174 (85.3)
Marital status, <i>n</i> (%)	
Relation	122 (59.8)
No relation	82 (40.2)
Work status, <i>n</i> (%)	
Employed	154 (75.5)
Unemployed	32 (15.7)
Retired	18 (8.8)
Education, <i>n</i> (%)	
Low	41 (20.2)
Middle	81 (39.7)
High	82 (40.2)
Religion, <i>n</i> (%)	
Religion	87 (42.6)
No religion	117 (57.4)
Sexual identity, <i>n</i> (%)	
Heterosexual	63 (30.9)
Homosexual	128 (62.7)
Bi-sexual	13 (6.4)
Sexual behaviour, <i>n</i> (%)	
Sexually active	178 (87.3)
Not sexually active	26 (12.7)

Notes: *n* = total, *SD* = standard deviation

Table 2

Descriptive statistics of social support, stigma and sexuality problems

Variable	Mean \pm SD	Range	Ref range	Cut-off point
1. Social support	29.16 \pm 6.14	12 – 47	12 – 48	< 26
2. Stigma	20.89 \pm 5.50	10 – 36	10 – 40	> 19
3. Sexuality problems	18.56 \pm 6.25	8 – 36	8 – 40	> 19

Notes: *SD* = standard deviation, Ref range = reference range,

Table 3
Regression model of stigma, social support and sexuality problems

	R ^{2a}	β^b	95% CI
Social support	.089		
Stigma		-.079	[-.254, .007]
Sexuality problems		-.270***	[-.411, -.120]
Stigma	.201		
Social support		-.069	[-.179, .054]
Sexuality problems		.431***	[.265, .494]
Sexuality problems	.245		
Social support		-.224***	[-.353, -.103]
Stigma		.407***	[.323, .602]

Notes: a: Adjusted R squared, b: Standardised coefficients beta, CI: Confidence Interval, *** $p \leq .001$

Table 4
Regression model of social support

	Model 1			Model 2		
	R ^{2a}	β^b	95% CI	R ^{2a}	β^b	95% CI
	.129			.138		
Age		-.068	[-.127, .057]		-.093	[-.140, .045]
Hive age		.084	[-.053, .195]		.118	[-.027, .227]
Gender		-.075	[-4.195, 1.591]		-.097	[-4.605, 1.262]
Relation		-.106	[-3.017, .367]		-	-
Education low		-.153*	[-4.609, -.068]		-	-
Education middle		-.139	[-3.550, .073]		-	-
Work status Unemployed		-.236***	[-6.296, -1.660]		-	-
Work status Retired		.010	[-3.337, 3.781]		-	-
Religion		-.048	[-2.256, 1.078]		-.049	[-2.286, 1.075]
Homosexual		-.051	[-2.875, 1.580]		-.070	[-3.122, 1.346]
Bisexual		-.077	[-5.722, 1.872]		-.086	[-5.968, 1.645]
Sexual behaviour		-.196**	[-6.123, -1.082]		-	-
Education low*employed					-.063	[-3.909, 1.591]
Education low*unemployed					-.331***	[-12.330, -4.892]
Education low*retired					-.067	[-10.59, 3.826]
Education middle*employed					-.156	[-4.102, -.022]
Education middle*unemployed					-.084*	[-6.627, 1.591]
Education middle*retired					-.046	[-6.201, 3.297]
Education high*unemployed					-.167*	[-8.312, -.744]
Education high*retired					.031	[-3.984, 6.091]
Relation*not sexually active					-.068	[-5.885, 2.025]
No relation*not sexually active					-.235***	[-8.445, -2.254]
No relation*sexually active					-.084	[-2.931, .738]

Notes: a: Adjusted R squared, b: Standardised coefficients beta, CI: Confidence Interval, * $p \leq .050$, ** $p \leq .010$, *** $p \leq .001$

Table 5
Regression model of stigma

	Model 1			Model 2		
	R ^{2a}	β^b	95% CI	R ^{2a}	β^b	95% CI
	.133			.137		
Age		-.024	[-.093, .072]		-.041	[-.102, .065]
Hive age		-.195**	[-.259, -.037]		-.161	[-.236, -.009]
Gender		.065	[-1.582, 3.590]		.044	[-1.953, 3.305]
Relation		.210**	[.841, 3.865]		-	-
Education low		-.018	[-2.272, 1.786]		-	-
Education middle		-.028	[-1.934, 1.304]		-	-
Work status Unemployed		.194**	[.849, 4.993]		-	-
Work status Retired		-.083	[-4.789, 1.572]		-	-
Religion		.130	[-.050, 2.929]		.117	[-.212, 2.801]
Homosexual		-.062	[-2.692, 1.289]		-.075	[-2.857, 1.147]
Bisexual		-.067	[-4.909, 1.878]		-.076	[-5.114, 1.710]
Sexual behaviour		.034	[-1.692, 2.812]		-	-
Education low*employed					.029	[-1.985, 2.944]
Education low*unemployed					.042	[-2.359, 4.307]
Education low*retired					-.044	[-8.488, 4.434]
Education middle*employed					-.050	[-2.423, 1.233]
Education middle*unemployed					.112	[-.700, 6.665]
Education middle*retired					.011	[-3.934, 4.579]
Education high*unemployed					.161*	[.511, 7.294]
Education high*retired					-.137	[-8.654, .375]
Relation*not sexually active					.084	[-1.416, 5.673]
No relation*not sexually active					.122	[-.285, 5.264]
No relation*sexually active					.216**	[.886, 4.175]

Notes: a: Adjusted R squared, b: Standardised coefficients beta, CI: Confidence Interval, * $p \leq .050$, ** $p \leq .010$

Table 6
Regression model of sexuality problems

	Model 1			Model 2		
	R ^{2a}	β^b	95% CI	R ^{2a}	β^b	95% CI
	.072			.072		
Age		.055	[-.068, .126]		.043	[-.076, .121]
Hive age		-.055	[-.177, .083]		-.021	[-.152, .115]
Gender		.147	[-.460, 5.618]		.116	[-1.054, 5.140]
Relation		.180*	[.504, 4.058]		-	-
Education low		-.087	[-3.733, 1.036]		-	-
Education middle		-.059	[-2.660, 1.145]		-	-
Work status Unemployed		.189**	[.803, 5.672]		-	-
Work status Retired		-.003	[-3.801, 3.675]		-	-
Religion		.106	[-.415, 3.087]		.088	[-.668, 2.882]
Homosexual		.089	[-1.190, 3.489]		.069	[-1.468, 3.250]
Bisexual		.077	[-2.021, 5.955]		.072	[-2.188, 5.851]
Sexual behaviour		.129	[-.244, 5.050]		-	-
Education low*employed					-.001	[-2.913, 2.894]
Education low*unemployed					.005	[-3.800, 4.054]
Education low*retired					-.062	[-10.810, 4.414]
Education middle*employed					-.048	[-2.799, 1.509]
Education middle*unemployed					.090	[-1.619, 7.058]
Education middle*retired					.034	[-3.909, 6.121]
Education high*unemployed					.181*	[.992, 8.984]
Education high*retired					-.032	[-6.413, 4.225]
Relation*not sexually active					.146*	[.037, 8.389]
No relation*not sexually active					.172*	[.719, 7.256]
No relation*sexually active					.195**	[.664, 4.538]

Notes: a: Adjusted R squared, b: Standardised coefficients beta, CI: Confidence Interval, * $p \leq .050$, ** $p \leq .010$