

**The General Practice Mental Health Professional and patient satisfaction**

Assessing the influence of GP-MHP related characteristics on patient satisfaction

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**Abstract**

The General Practice Mental Health Professional (GP-MHP), a function introduced in 2008, provides short term treatment and diagnostic measurement under supervision of a GP The GP-MHP supports the GP in providing mental health services within a general practice. Because of the relative novelty of the GP-MHP function, Scientific literature about this topic is scarce. Furthermore, the influence of GP-MHP characteristics on patient satisfaction through multiple measures was examined. Data was collected through questionnaires. 44 GP-MHPs and 630 of their patients participated in this study. Multilevel logistic regression with a priori selected and additionally selected GP-MHP and patient-related confounders was performed to measure patient satisfaction. The findings of this study suggest that patients of GP-MHP are generally very satisfied about the care that they receive. For overall satisfaction grade the GP-MHP characteristics that seem to be influential are the type of employment and the number of intervision or supervision sessions a GP-MHP has. The patient-related confounders that were significant were age and number of consultations. For overall satisfaction, the GP-MHP characteristics that are influential are completing a GP-MHP post-bachelor’s training degree, the number of face-to-face a GP-MHP has on a working day, the type of consult with the GP and the use of questionnaires to support problem clarification or triage. The patient-confounders that is significant for the overall satisfaction score is the number of consultations with the GP-MHP.

**Keywords:** *General practice mental health professional, mental health, Netherlands, general practice, patient satisfaction*

**Preface**

This master’s thesis studies the influence of several General Practitioner Mental Health Professional characteristics on patient satisfaction. This thesis in combination with an internship at the Trimbos Institute has been written to meet the requirements to graduate in the master’s programme Sociology: Social Contemporary Problems at the University of Utrecht. The writing process occurred between February and June of 2020.

The research question of this thesis was formulated with the help of my internship supervisor, Jasper Nuijen. Writing my thesis and doing research was a hard time for me and Jasper, together with my thesis supervisor, Anne Brons, helped me through this, so I sincerely thank you both for all your patience, answers, feedback, availability, and repetitiveness of explanations. I also want to thank Wouter den Hollander for the patience and help during the period of data-analysis. Without actively realizing during the research period, I have learned so much from all of you.

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To my housemates and friends, thanks for keeping me motivated, giving me feedback and putting up with my hardship. Without you, life in general, but especially my thesis would be so much more difficult.

Enjoy reading!

Marissa Shanmugalingam,

Utrecht, June 26th 2020

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# In**troduction**

Public mental health is becoming more of a complex problem in contemporary society (Henderson, 2015). According to the Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2), 42,7 percent of Dutch citizens will experience a mental disorder according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria during their lifetime (de Graaf et al., 2010). Moreover, 11,9 percent of Dutch citizens reported mental health problems in 2018 (Statistics Netherlands, 2019). Mental health problems can cause significant losses of functioning and health (World Health Organization, 2017). Moreover, the quality of life of people close to the mentally ill person can be reduced (Dahmann & Schnitzlein, 2019). From social perspectives, mental health problems negatively affect society by increasing health care costs and decreasing productivity (Frank & McGuire, 2000). These reasons all together underline why it is important to tackle (public) mental health.

In the Netherlands, the General Practitioner (GP) acts as the gatekeeper to more specialized mental health care facilities, like mental health institutions or psychologists or psychiatrists having an independent practice. The proportion of the total Dutch general practice population that visits the general practice for mental health problems significantly increased from 12% in 2011 to 18% in 2017 (Beurs et al., 2018). One of the reasons for the increasing demand for mental health care in general practice is the introduction of the mental health care system reforms in 2014 (Griep et al., 2016). These changes concern the redistribution of mental health care in such a way that patients with mild mental health problems must ultimately be treated in the general practice instead of in more specialized mental health care. The changes were implemented because it reduces costs and waiting lists in specialized mental health care. The main objective of this change was to increase sustainability and effectiveness of the mental health care system (Magnée, 2017).

The General Practice Mental Health Professional (GP-MHP), a function introduced in 2008, provides short term treatment and diagnostic measurement under supervision of a GP (Magnée et al., 2018). The GP-MHP supports the GP in providing mental health services within a general practice. Mainly due to the mental health care system reforms in 2014, the proportion of general practices employing a GP-MHP has considerably increased from 20% in 2010 to 88% in 2014. The GP-MHP treats patients with relatively mild mental health problems within the general practice, and refers patients with more severe full-blown mental disorders to more specialized mental health care.

The function GP-MHP is relatively new and developing. This causes the function profile to still be in a process of reviewing and developing (Dutch General Practitioners Association et al., 2014). The most recent update of the profile of the function GP-MHP was published this year (Dutch General Practitioners Association et al., 2020). It is important to stress that the function GP-MHP cannot be classified as a profession yet. Accordingly, the function of GP-MHP can be fulfilled by professionals with different backgrounds and degrees. Most GP-MHPs are trained in psychiatric nursing, but the function of the GP-MHP is also often fulfilled by psychologists or social workers (Magnée et al., 2020). GP-MHPs also differ on other characteristics.

According to a survey completed by 407 GP-MHPs, GP-MHPs differ in terms of educational background, years of work experience as a GP-MHP, obtaining of a post-bachelor’s trainingdegree, the number of consultations a GP-MHP has on an average workday, and the waiting time for an intake consultation with the GP-MHP (Magnée et al., 2020). Given this variation, it is possible that differences between GP-MHPs exist in the quality of care provided to patients with mental health problems, which in turn may lead to different levels of patient satisfaction (Nuijen et al., 2016).

Studies suggest that a significant proportion of patients visiting a GP-MHP did not feel satisfied with the care received (Nuijen et al., 2016). However, this research did not consider the potential influence of characteristics of the professional and function GP-MHP. Therefore, it is unknown whether GP-MHP-related factors are associated with patient satisfaction.

Merkouris et al. (2013) state that the quality and the competence of healthcare services is measurable through the opinions and satisfaction that patients and their relatives acquire after receiving these services. Next to that, measuring patient satisfaction is becoming increasingly valuable when assessing healthcare results, because of the contemporary focus on better cooperation between care providers and care receivers (Bockting et al., 2004). This could eventually lead to higher quality of mental health care on a national level, which would result in higher patient satisfaction. The aim of this exploratory study is to determine *whether characteristics of the professional and function GP-MHP are associated* *with patient satisfaction regarding the care received from a GP-MHP.*

Establishing which GP-MHP-related factors are associated with patient satisfaction is important to take into account when promoting the quality of care provided by GP-MHPs and to further develop guidelines for a regular profession profile. In this study, the influence of GP-MHP-related characteristics on patient satisfaction will be researched by using data collected through questionnaires. The participants that take part in this study are 44 GP-MHPs and 630 of their patients.

# Theoretical background

## Measuring patient satisfaction

Literature about the satisfaction of patients regarding the care of the GP-MHP is still scarce. The reason for this is that the function of the GP-MHP is relatively new and developing. To determine which domains of patient satisfaction of the GP-MHP are important to measure from the perspective of patients, the recently updated function profile of the GP-MHP (Dutch General Practitioners Association et al., 2020) is used. The function profile of the GP-MHP follows the CanMEDS-roles. This model is introduced by the Royal College of Physicians and Surgeons of Canada (RCPSC) (Hamel et al., 2007). Next to the CanMEDS-roles, the function profile of the GP-MHP is based on core values that shine a light on how the care that a GP-MHP provides should be executed. First, the care that the GP-MHP delivers should be focused on preserving, strengthening and recovering the mental health. This means that the patients of the GP-MHP should feel that the care delivered by the GP-MHP supports them in dealing with their mental health problems. Secondly, ‘shared decision making’ between the patient and the GP-MHP is a core value in the care provided by a GP-MHP. The process of shared decision making is especially important for the patients, because it allows the patient to make better-informed choices regarding the care that they receive. Shared decision making can be defined as the cooperation between the care provider and the patient on making evidence informed and value congruent decisions (Grad et al., 2017). A third core value of the function GP-MHP that is important from the perspective of patients is communication and interaction with the patient. This means that the GP-MHP has to communicate and interact with the patient in the most suitable way. A final core value that is important from the patient’s perspective is the availability and accessibility of the GP-MHP. To achieve continuity of care provision, sufficient availability and accessibility is essential.

Another way to identify which domains of patient satisfaction are relevant to measure is analysing scientific literature. Since literature regarding patient satisfaction among patients of the GP-MHP is scarce, patient satisfaction among health care workers closely related to GP-MHP will be examined and applied to determine how patient satisfaction will be measured in this study.

Previous research reveals that patient satisfaction is an extensively researched and complex concept. Various researchers state, for example, that the most common way of measuring patient satisfaction is by calculating the overall satisfaction score (Miglietta et al., 2018; Paddison et al., 2015). Nevertheless, Al-Abri & Al-Balushi (2014) argue that the division of the concept of patient satisfaction is not well established. Because of the complexity of patient satisfaction as a concept, patient satisfaction is often divided into multiple aspects. Researchers use different scales and different divisions of aspects to measure patient satisfaction. This means that there is not one universal set of confirmed and scientifically founded domains by which patient satisfaction can be measured. However, there is some consistency found in how patient satisfaction is divided into measurable aspects.

First, *shared decision making* is a frequently measured aspect of patient satisfaction (Wong et al., 2011). A reason that shared decision making is more prevalent in health care is the shifting towards implementing more shared decision making and patient involvement during the last years (Scholl et al., 2011). According to Truglio-Londrigan (2015), who performed a qualitative research on which aspects of nursing care are deemed important as reported by patients, shared decision making benefits patient satisfaction. Wong et al. (2011), who studied patient satisfaction among patients that had ever been admitted to a local hospital in Hong Kong, complement this finding by reporting that shared decision making had a positive correlation with overall satisfaction. This also adds to the research findings of Suh & Lee (2010), who found in their literature review on the impact of shared decision making on patient satisfaction, that shared decision making in comparison with other determinants such as age, gender and number of consultations is the most influential predictor of patient satisfaction.

Second, *availability and accessibility* of the care provider is considered to be an important aspect of patient satisfaction (Batbaatar et al., 2017; Brédart et al., 2007; Wensing et al., 2002). Mpinga & Chastonay (2011) performed a literature review using Rodgers’ concept analyses to determine predictors of patient satisfaction. They found that the relationship between accessibility and availability and patient satisfaction is significant. Wensing et al. (2002) studied the characteristics of GP’s and practices in relation to patient satisfaction using data of nine European countries. They complement the results of Mpinga & Chastonay (2011) by finding that high availability of the participating GP’scorrelated positively with higher patient satisfaction. Brédart et al. (2007) found similar evidence in their research about the determinants of patient satisfaction of doctors and nurses in oncology settings in European and Asian countries.

Third, a domain that is frequently measured in the scientific literature is *communication skills* (Itri, Yacob & Mithqal, 2017: Pelletier et al., 2015; Al-Abri & Al-Balushi, 2014; Lotfi et al., 2019). According to Itri, Yacob & Mithqal (2017), communication is the most valuable asset between the care provider and the care receiver. Communication plays a relevant part in patient satisfaction, because it is the most important part in human interactions in all contexts (Pelletier et al., 2019). Furthermore, communication between care providers and care receivers serves psychological needs, such as talking about concerns and fears. The other aspects of patient satisfaction found in literature are rooted in communication skills. The extent of how much and in what way talking about these fears and concerns can have a positive influence on patient satisfaction (Pelletier et al., 2019). Paddison et al. (2015) also found that doctor communication in health care had the strongest relation with overall satisfaction. This effect was found to be consistent across all ages and gender. Al-Abri & Al-Balushi (2014) complement this finding in their literature review by concluding that four studies in different hospitals and different countries also revealed that nurses’ courtesy, respect, careful listening and easy access of care had the strongest correlation with overall patient satisfaction in comparison to non-nurse related aspects of patient satisfaction. Moreover, Lotfi et al. (2019) found one of the most influential factors of dissatisfaction of patients on the burn ward in an Iranian hospital was the poor quality of the nurses’ communication with the patients.

The first domain of patient satisfaction that is commonly measured in relation to patient satisfaction is *staff competence* and *relation with staff.* Miglietta et al. (2018) state that staff competence and relation with staff were the most consistently measured aspect of patient satisfaction in 24 of 28 questionnaires researched in their literature review about patient satisfaction scales in mental health care. This adds to the research findings of Ratner et al. (2018) who studied patient satisfaction among 125 psychiatric patients hospitalized with schizophrenia or a schizoaffective disorder. They also found that the patient-staff interactions correlate the strongest with overall satisfaction. Another study by Kuosmanen et al. (2006) also points to the importance of taking into account patient-staff interactions or relationships when measuring patient satisfaction. They examined inpatient satisfaction in a Finnish psychiatric hospital and found that respondents were most satisfied about the patient-staff relationships in comparison with the other aspects.

In summary, there are four core values that are important from the perspective of patients as described in the function of the GP-MHP. These are ((1) preserving, strengthening and recovering the mental health, (2) shared decision making, (3) accessibility and availability and (4) interaction and communication) are important to take into account when measuring aspects of patient satisfaction in this study. These values show much of an overlap with the most important aspects found in the scientific literature. These are ((1) staff competence and relation with staff, (2) shared decision making and (3) accessibility and availability of the GP-MHP and (4) communication skills). Based on the core values of the function profile of the GP-MHP and the aspects of patient satisfaction found in literature, the following domains of patient satisfaction will be measured through a questionnaire: 1) participation within the shared decision making process 2) the availability and accessibility of the GP-MHP, 3) interaction and communication with the GP-MHP and 4) the support of the GP-MHP in mental health recovery. Overall satisfaction will also be measured and calculated using the established domains.

## Potential influential GP-MHP characteristics

Next to determining which domains of patient satisfaction are relevant to measure regarding the care received from GP-MHPs, it is important to establish which GP-MHP related characteristics influence these different domains of patient satisfaction. Because of the novelty of the GP-MHP function, no literature about the influence of GP-MHP characteristics on patient satisfaction exists. It is known much variation exists between GP-MHPs (Magnée et al., 2020), including the educational background and having completed a GP-MHP post-bachelor’s training degree or not. It is possible these differences influence patient satisfaction with the care received from the GP-MHP.

For this study, an expert panel (consisting of two GP-MHPs, one GP, one representative of a patient organization and three researchers) selected a priori five characteristics which, in any case, need to be examined as potential predictors of patient satisfaction: 1) having a nursing background, 2) the type of employment, 3) the number of face-to-face consultations on a working day, 4) having completed a GP-MHP post-bachelor’s training, and 5) years of work experience as a GP-MHP. This selection was based on the importance of these characteristics from a policy perspective. Based on the findings, policy makers can decide to implement changes resulting in higher patient satisfaction. For instance, if having a nursing background is found to be related to higher patient satisfaction, having a nursing background could be a requirement before starting the trajectory to become a GP-MHP. Or if patients with a GP-MHP employed by the general practice tend to be more satisfied than patients who are treated by a GP-MHP on a secondment basis, it could be enforced that general practices rather employ GP-MHPs directly instead of through an employment agencies. Based on existing literature or my own line of reasoning, I discuss below why we expect these five characteristics to be related to patient satisfaction.

GP-MHPs come from different backgrounds and have a lot of experience in their previous job field (Magnée et al., 2020). It is therefore possible that differences between what GP-MHP’s believe to be important regarding the care for patients exist. This could also result in differences in patient satisfaction. This does not guarantee that the care delivered by GP-MHPs with a background in nursing is more satisfying than the care delivered by GP-MHPs with other backgrounds. In addition to this, Knoops & Kloosterman (2019) demonstrate that patient satisfaction between different care-providers does not vary significantly. Although previous research does not indicate a relationship between having a nursing background and patient satisfaction, if nursing background is a significant measure of patient satisfaction, this would be relevant from policy perspective. However, this relationship has not been explicitly tested yet.Hence, It is assumed *that having a nursing background positively influences patient satisfaction* (H1) *.*

GP-MHPs can be employed by the general practice, work on a secondment basis or be self-employed. GP-MHPs who are seconded by another organisation may tend to work shorter and more temporary at the same general practice than GP-MHPs who are employed by a general practice. This could give GP-MHPs who are employed by the general practice, time to built a bond with the general practice and their patients. This could in turn result in enough time and space to adjust to the wishes and needs of the patient and therefore also maintain higher patient satisfaction. It is assumed that *if a GP-MHP is employed by a general practice that the patient satisfaction is higher than if the GP-MHP is employed on a secondment basis* (H2)*.*

The number of face-to-face consultations a GP-MHP has on an average workday can possibly affect patient satisfaction. This assumption is based on the idea that when GP-MHPs have less face-to face consultations in a day, they have more time to spend per patient which could ultimately result in more satisfied patients. Gross et al. (1998) found that the time spend with the physician has a positive effect on patient satisfaction. This finding is consistent with the results shown in the study of Tehrani et al. (2011), who studied data of over 14,000 patients visits in the US. They found that the time that doctors spend with their patient was significantly related to patient satisfaction. Given these findings, it is assumed *that the lower the number of face-to-face consultations the GP-MHP has, the higher the patient satisfaction* (H3).

Furthermore, it is likely to assume that patients with GP-MHPs who have followed a GP-MHP post-bachelor’s training are more satisfied with their GP-MHP. That is, these GP-MHPs follow extra training in possessing and executing the tasks that are part of their function. The training puts the core values (described earlier) that are relevant from patient perspective central (Derckx et al., 2015). Being trained as a GP-MHP with eye on the core values that are important regarding the interaction with patients, could lead to higher patient satisfaction. Thus, it can be hypothesized *that having a completed a GP-MHP’s post-bachelor’s training degree improves patient satisfaction* (H4)*.* Of note, Laurant et al. (2008) did not find a difference between nurse practitioners that received post-bachelor training and nurse practitioners that did follow post-bachelor’s training in patient satisfaction. However, it is unknown to what extent these findings concerning nurse practitioners also apply to GP-MHPs.

Lastly, the number of years (or work experience) might also have an influence on the patient satisfaction. Chan (2005)studied patient satisfaction in triage nursing care in Hongkong. The aim of this study was to examine the relationship between patient satisfaction and nurse satisfaction in order to improve nursing care. They found that work experience did not have an effect on patient satisfaction. Han et al. (2003) studied the relationship between nurse characteristics, patient characteristics and patient satisfaction at a teaching hospital in Taiwan. They also found that work experience in the unit was not significantly related to patient satisfaction. Work experience as a nurse in general however, slightly impacted patient satisfaction. Laurent et al. (2008) found that years of experience of a nurse practitioner did not significantly affect patient satisfaction. Although previous research does not indicate a relationship between the years of experience as a GP-MHP and patient satisfaction, it is still relevant from policy perspective to include this GP-MHP characteristic in this study. GP-MHPs with more years of experience as a GP-MHP, have more experience treating patients, so they are more skilled at handling patients. Therefore, patient satisfaction could be higher. Furthermore, it is expected *that the higher the number of years the GP-MHP has been working as his or her contemporary function, the higher the patient satisfaction* (H5).

# Methods

## Study design and population

A cross-sectional study in the Netherlands was conducted by the Trimbos Institute among adults who consulted a GP-MHP (between 2018 and 2019). This study was part of a larger study on the quality of care provided by GP-MHPs.

The population sample of this study consisted of two different groups of participants. The first group of participants were the GP-MHPs. To ensure variation among participating GP-MHPs, purposive sampling was performed based on type of employment arrangement (i.e. employed by a general practice, self-employed or seconded from another organization). From the beginning of 2017, GP-MHPs were recruited through seven regional organizations located throughout central Netherlands, and representing the different employment types. The second sample of this study consisted of patients of the participating GP-MHP. The GP-MHPs participating in this study were originally instructed to each invite at least 60 eligible patients. However, in practice this number was not feasible for a significant proportion of the GP-MHPs. Six GP-MHPs who recruited only one or two participating patients were excluded from analysis.

Patient eligibility criteria were: being 16 years of age or older and having an intake consultation with the GP-MHP. In case a GP-MHP worked for multiple general practices, the patients would only be recruited from the general practice that is taking part in this study.

Every participating GP-MHP received an instruction form on how to invite patients to take part in this study. Patients were informed about the satisfaction questionnaire during the first consultation with the GP-MHP. The GP-MHP asked if patients agree with the Trimbos Institute sending more information about participating and the handling of the data collected. Patients that agreed to receive this information, gave consent by signing a consent form. Name and e-mail address of the patients were also asked on the consent form. The Trimbos Institute sent two e-mails to the participants. The first e-mail contained further information about participation. Three months after the intake consultation, a second e-mail with a link to the questionnaire was sent. Patients were still able to refuse participation in the questionnaire. If the patient did not fill in this questionnaire, two reminders were sent. The response rate was around 40% . Eventually, data from 44 GP-MHPs and 630 patients were examined.

## Measures

The data used in this study was collected through questionnaires. The participating GP-MHPs filled in a questionnaire on their background characteristics. Their patients filled in another questionnaire about their demographic characteristics and their level of patient satisfaction regarding the care that they receive(d) from the GP-MHP. This questionnaire was filled in three months after the first consultation with the GP-MHP.

### Dependent variables: patient satisfaction

In this study, patient satisfaction was measured by an adaptation of a questionnaire that was originally developed by Praktijkondersteuning Zuidoost-Brabant (PoZoB) and other care groups, for children and their parents visiting a GP-MHP. The questionnaire has been adapted to suit adults. The questionnaire consisted of 16 items that measure patient satisfaction. 15 out of 16 items are also provided for an overall patient satisfaction score. This overall satisfaction score was calculated through computing the mean of these 15 items (Cronbach’s α = .89). These are also dividable into different domains. The items will be explained through the corresponding domains. Answer possibilities on all these questions were ‘Yes’, ‘A little’, ‘No’ and ‘Not applicable’. ‘Yes’ was given the value of 100. ‘A little’ was given the value of 50. ‘No’ was given the value of 0. ‘Not applicable and ‘don’t know’ were recoded as missing. The 16th item in the questionnaire asked patients to rate their level of satisfaction on a 1 to 10 scale. This question was ‘On a scale of 1/10, how would you rate the care received by the GP-MHP?’ The higher the mark, the more likely it was that the patient was satisfied about the care received from their GP-MHP.

Confirmatory factor analysis determined which domains of patient satisfaction were measured in the questionnaire. These domains were computed through calculating the mean of the items that represented the different domains in the questionnaire. The factor analysis established four domains concerning more than one item. The first domain measures patient satisfaction about the participation within the shared decision making process. The 4 questions that measure this aspect in the questionnaire were ‘Is the goal of the care delivered by the GP-MHP clear?’, ‘Does the GP-MHP discuss the aim of the care with you?’, ‘Are you able to have a say in what kind of care you will receive from the GP-MHP?’ and ‘Do you agree with the aim om the care received by the GP-MHP?’ (Cronbach’s α = .77).

The second aspect of patient satisfaction that was measured in this study is the accessibility and the availability of the GP-MHP. Three items ( ‘Were you able to quickly make an appointment?’, ‘Are you able to see the GP-MHP as often as you want?’ and ‘Do you think that the length of your consult is sufficient?’) measured this domain.( The Cronbach’s α = .51). the item ‘Do you think that the length of your consult is sufficient?’ decreases the Chronbach’s α with .014. A reason for this could be that this question is more directly asking for a thought than the other questions.

The third domain that was measured is the interaction and communication with the GP-MHP. Two items, namely ‘Do you trust the GP-MHP?’ and ‘Do you think the GP-MHP is treating you respectfully?’ measured this aspect (Cronbach’s α =.78).

The fourth aspect that was measured is the support of the GP-MHP in mental health recovery. This aspect was measured trough four items, namely ‘Do you feel supported enough by the GP-MHP?’, ‘Are you satisfied with the outcomes of the care received?’, ‘Are you able to get more grip on your problems trough the care delivered by the GP-MHP?’ and ‘Does the help provided by the GP-MHP help you deal with things you previously had problems with?’ (Cronbach’s α = .89).

Next to these domains, satisfaction about the referral from the GP to GP-MHP and satisfaction about the referral of the GP-MHP to another care provider was also measured. Both aspects of referral were measured with one item. The corresponding questions were ‘Is it clear why you have been referred from the GP to the GP-MHP?’ and ‘Do you think that the GP-MHP has arranged the referral to another care provider well?’

Based on the items in the questionnaire, patient satisfaction will be measured in multiple ways. The first way is assessing the satisfaction grade that patients were explicitly asked to give. Second, an overall satisfaction score based on 15 items, was calculated. Lastly, patient satisfaction was measured by the four different domains found in the questionnaire, supplemented by the two items about the satisfaction concerning the referral to and from the GP-MHP. Missing values were labeled as missing to exclude them from data analysis.

### Independent variables: characteristics of the professional and function GP-MHP

GP-MHPs completed a questionnaire about their background characteristics and the organization of their function in daily practice. Given the wide range of GP-MHP characteristics assessed, an expert panel suggested that having a nursing background (0 = ‘No’, 1 = ‘Yes’); pursuing or having completed a GP-MHP post-bachelor’s training (0 = ‘No’, 1 = ‘Yes’); years of work experience as a GP-MHP (1= <2, 2 =2-4, 3 = 4-8 4 = >8) ; having ten or more consultations on an average eight-hour working day (0 = >10, 1 = <10); and type of employment arrangement (0 = ‘Employed by the general practice or self-employed’ 1= ‘On a secondment baseis’), were essential from policy perspective to be included in the analyses.

Next to these five GP-MHP characteristics, certain patient related characteristics were also a priori selected to include in the model. These characteristics were age (in years) and gender (0 = ‘Female’, 1 = ‘Male’).

Second, besides these variables, the following GP-MHP characteristics were considered by a statistical selection procedure to be included in the model: age (in years), gender (0 = ‘Female’, 1 = ‘Male’), Work experience in years in mental health care, the number of weekly working hours as a GP-MHP (1 = <16, 2 = 16- 28, 3 = >28), the type of consults the GP-MHP has with the GP (0 = ‘Ad hoc consultation’, 1 = ‘Fixed consultations (combined with ad hoc consultation)), the length of waiting time (0 = >2 weeks, 1 = <2 weeks), the use of questionnaires to support problem clarification or triage (0 = ‘Sometimes, rarely or never’, 1 = ‘Always or often’), the use of questionnaires to monitor outcomes (0 = ‘Sometimes, rarely or never’, 1 = ‘Always or often’), the hours of training received in the previous 12 months (0 = <20, 1 = >20) and the number of intervision or supervision sessions the GP-MHP has received in the previous 12 months (0 = <6, 1 = >6).

The following baseline characteristics of the participating patients as potential confounders were also considered to be included in the statistical selection procedure: educational background (1 = ‘Low’, 2 = ‘Middle’, 3 = ‘High’) , the number of consultations with the GP-MHP (1 = 1-2, 2 = 3, 3 = 4, 4 = 5 , 5 = >6), and whether the patient still received care from the GP-MHP or not ( 0 = ‘No’, 1 = ‘Yes’). These predictors were included in the questionnaire regarding patient satisfaction. Missing values were labeled as missing to exclude them from data analysis.

## Statistical analyses

First, several descriptive statistics were analysed, which include the GP-MHP characteristics that potentially influence patient satisfaction, the patient characteristics that were potentially influencing patient satisfaction as confounders and the different measures of patient satisfaction including satisfaction grade, the overall satisfaction score and the domains of overall satisfaction. These were shown in tables 1, 2, 3 and 4. Based on these analyses, it was established that the sample distribution was highly skewed. For that reason, it was decided to dichotomize the dependent variables regarding patient satisfaction. The following thresholds were used to define ‘more satisfied’ patients: a satisfaction grade of 8 or more (0 = <8, 1 = >8), an overall satisfaction score of 95 or more (0 = <95, 1 = >95), and domain scores of 100 (0 = <100, 1 = 100). Because of the dichotomizing of the dependent variables and the clustering of patients with the same GP-MHP, multilevel logistic regression analysis will be performed. The descriptive analyses were performed using SPSS.

Additionally to the variables a priori selected by an expert panel, a statistical procedure was conducted to select potential predictors and confounders. This procedure removed variables that were redundant and unlikely to add any significant information to the final model using the Least Absolute Shrinkage and Selection Operator (LASSO). Correct application of procedure results in the elimination of multicollinearity.

Because of clustering of patients the population sample, multi level logistic regression analysis in R was conducted. The glmer() of the ‘lme4’ package was used to construct the necessary models.

Next, the assumptions of logistic regression were investigated. The first assumption is that the dependent variable should be dichotomous and the independent variables should be of numerical value (Field, 2013). Most independent variables were of (ordinal) categorical value, which initially means that this assumption is violated. Dummies of these variables were constructed to include in the models instead. The second assumption of a logistic regression is to have no significant multicollinearity. Multicollinearity can be defined as a significant correlation between independent variables that are included in the model, which could influence the results (Allen, P., Bennett, K., & Heritage, 2014)The examination of this assumption will be described in the discussion section. The third assumption of logistic regression is logit linearity. In the case of multilevel logistic regression, the normal distribution of the residuals of the models were investigated. All residuals were normally distrusted. The last assumption to be examined were the distribution of outliers. No outliers were found within the variables

After constructing the models, the interpretability was investigated by searching for potential warnings and errors. The models predicting patient satisfaction about the availability and accessibility , and interaction and communication with the GP-MHP showed the following warning: ‘boundary (singular) fit: see ?isSingular’. This warning indicated that there was a problem with the relationship between the independent variables and the dependent variables. The fitting of the model is disrupted and interpretability is not entirely reliable. The prediction model analysing patient satisfaction about the support of the GP-MHP in mental health recovery displayed the following warning: ‘Model is nearly unidentifiable: very large eigenvalue - Rescale variables?’. This could be interpreted as that problems occurred during computing with the independent variables. Limitations that these warnings and errors brought, are described in the discussion section.

Table 5 showed the association between independent variables and satisfaction grade. Table 6 showed the association between the independent variables and overall satisfaction score. The domains concerning participation within the shared decision making process, the availability and accessibility of the GP-MHP, interaction and communication with the GP-MHP and the support of the GP-MHP in mental health recovery displayed and their relationship with the independent variables will be shown in table 6. Variables with a *p* <.05 are being defined as significant.

# Results

## Descriptive statistics

**Table 1. Characteristics of participating general practice mental health professionals (GP-MHPs) (N=44)**

|  |  |
| --- | --- |
|  | %, M (range) |
| Female gender | 70.5 |
| Age | 49.2 (31-63) |
| < 45 | 29.5 |
| 45-55 | 40.9 |
| > 55 | 29.5 |
| Nursing background | 68.2 |
| GP-MHP post-bachelor’s training degree (in progress or completed) | 56.8 |
| Work experience as a mental health care professional in years | 22.3 (1-41) |
| Work experience as a GP-MHP in years | 5.3 (1-14) |
| <2 | 15.9 |
| 2-4 | 36.4 |
| 4-8 | 25.0 |
| >8 | 22.7 |
| Working hours per week as a GP-MHP | 23.2 (6-36) |
| <16 | 20.5 |
| 16-28 | 52.3 |
| ≥28 | 27.3 |
| Number of consultations on an average  eight-hour working day | 9.4 (4-15) |
| <10 face to face consults | 47.7 |
| ≥10 face to face consults | 52.3 |
| Employment arrangement |  |
| Employed by a general practice or self-employed | 36.4 |
| On a secondment basis | 63.6 |
| Fixed consults with GP in combination with ad hoc consult | 59.1 |
| Waiting time less than two weeks | 77.3 |
| Using questionnaires always or often to support problem clarification or triage | 56.8 |
| Using questionnaires always of often to monitor outcomes | 25.0 |
| Having received ≥20 hours of continuing training (in the previous 12 months) | 59.1 |
| Having received ≥6 times intervision or supervison (in the previous 12 months) | 77.3 |

Table 1 shows the characteristics of the participating GP-MHPs. The majority of GP-MHP is female (70.5%). Most GP-MHPs are aged between 45-55. Next to that, mostGP-MHPs work between 16 and 28 hours a week as a GP-MHP. It is also shown that most GP-MHPs are working on a secondment basis (63.6%). For 77.3% of the GP-MHPs the waiting time for patients is less than two weeks. The vast majority of the GP-MHPs does sometimes, rarely or never uses questionnaires to monitor care outcomes. At least three-quarter of the GP-MHPs received 6 or more inter- and/or supervision sessions in the past 12 months (77.3%).

**Table 2. Characteristics of participating patients (N=630)**

|  |  |  |
| --- | --- | --- |
|  | %, M (range) | Missing values |
| Female gender | 71.6 |  |
| Age (years) | 45.0 (16-84) |  |
| 16-29 | 21.4 |  |
| 30-44 | 24.4 |  |
| 45-59 | 35.1 |  |
| ≥60 | 19.0 |  |
| Educational level ᵃ |  | 4 |
| Low | 18.7 |  |
| Middle | 38.5 |  |
| High | 42.8 |  |
| Number of consultations with GP-MHP | 4.7 (1-50) |  |
| 1-2 | 16.5 |  |
| 3 | 20.8 |  |
| 4 | 21.6 |  |
| 5 | 17.1 |  |
| >6 | 24.0 |  |
| Still receiving care from GP-MHP | 50.6 |  |

ᵃ Low: less than primary education, primary education, lower secondary education. Middle: higher secondary education, lower vocational education. High: higher vocational education, university

Table 2 presents the characteristics of the participating patients. It is shown that most participating patients are female (71.6%), are aged between 45 and 59 (35.1%), obtained a high educational level (42.8%) and have had 6 or more consultations with their GP-MHP (24%)

**Table 3. Patients’ satisfaction about the general practice mental health professional (GP-MHP) (N=630)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | M | Std. | Median | Range | Missing values |
| Satisfaction grade (1-10) (1 item) | 7.8 | 1.4 | 8.0 | 1-10 |  |
| Overall satisfaction score  (15 items) | 89.1 | 15.4 | 93.3 | 13-100 | 1 |
| Satisfaction domain scores |  |  |  |  |  |
| The referral by the GP to the GP-MHP (1 item) | 98.0 | 12.4 | 100.0 | 0-100 | 41 ᵃ |
| The participation within the shared decision making process (4 items) | 92.6 | 16.7 | 100.0 | 0-100 | 1 |
| The accessibility and availability of the GP-MHP (3 items) | 85.4 | 21.8 | 100.0 | 0-100 | 2 |
| The interaction and communication with the GP-MHP (2 items) | 97.0 | 13.3 | 100.0 | 0-100 | 3 |
| The support of the GP-MHP in mental health recovery(4 items) | 82.3 | 26.3 |  | 0-100 | 4 |
| The referral by the GP-MHP to another care provider (1 item) | 83.9 | 33.4 |  | 0-100 | 366 ᵇ |

*Note.* ᵃRespondents who consulted the GP-MHP via another route than referral by the GP.

ᵇ Respondents who were not referred to another care provider.

Table 3 shows the descriptive characteristics of the different ways of measuring patient satisfaction. For all measures of patient satisfaction, the distribution is skewed to the right. The average satisfaction grade that is given by the patients is a 7.8. The majority of people is generally very satisfied. as that the participating patients of the GP-MHPs are generally satisfied about their GP-MHP. The average overall satisfaction score is also skewed to the right (89.1).

**Table 4. Percentage of patients (N=630) who were satisfied with the care received from the general practice mental health professional (GP-MHP)**

|  |  |  |
| --- | --- | --- |
|  | % | Missing values |
| Satisfaction grade (1 item): ≥8 | 69 |  |
| Overall satisfaction score (15 items): >95 | 48.3 | 1 |
| *Satisfaction domain scores* |  |  |
| Score on domain ‘The referral by the GP to the GP-MHP’ (1 item): 100 | 97.3 | 41 ᵃ |
| Score on domain ‘The possibility to participate in decisions about the care received from the GP-MHP’ (4 items): 100 | 74.9 | 1 |
| Score on domain ‘The accessibility and availability of the GP-MHP’ (3 items): 100 | 58.8 | 2 |
| Score on domain ‘The interaction and communication with the GP-MHP’ (2 items): 100 | 93.7 | 3 |
| Score on domain ‘The outcomes of the care provided by the GP-MHP’ (4 items): 100 | 55.1 | 4 |
| Score on domain ‘The referral by the GP-MHP to another care provider’ (1 item): 100 | 79.2 | 366 ᵇ |

*Note.* ᵃRespondents who consulted the GP-MHP via another route than referral by the GP.

ᵇ Respondents who were not referred to another care provider.

Table 4 shows the percentages of the dependent variables after dichotomizing. The majority of patients that participate in this study can be classified as more satisfied.

## Selected potential predictors and confounders

Next to a priori selected predictors and confounders, the LASSO method additionally selected the following predictors and confounders to be included in the prediction model for satisfaction grade (see Supplemental Table 1, Appendix B): work experience as a mental health professional in years, working hours per week as a GP-MHP, having received continuing training in hours (in the previous 12 months), having received intervision or supervison (in the previous 12 months), ducational backgroundof patients, number of consultations the patients with GP-MHP and still receiving care from GP-MHP. Regarding the model predicting overall satisfaction score, a second LASSO regression additionally selected the following predictors and confounders (see Supplemental Table 1, Appendix B): age of GP-MHP in years, type of consultations, the use of questionnaires to support problem clarification or triage, the use of questionnaires to monitor outcomes, having received intervision or supervision (in the previous 12 months), educational background of patients, number of consultations the patients had with their GP-MHP and still receiving care from GP-MHP. Next to the a priori selected variables, the LASSO provides for extra predictors through a statistical procedure to be included in the regression analysis. These variables are included in the final regression models.

## Multilevel logistic regression analysis

### Satisfaction grade

**Table 5.** **Multilevel logistic regression analysis predicting satisfaction grade with** **GP-MHP characteristics and patient-related confounders (N = 630)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | OR | 95% CI | *p* |
| *GP-MHPGP-MHP characteristics* |  |  |  |
| Nursing background  No  Yes | Reference  .87 | .46 - 1.63 | .65 |
| Obtained a GP-MHP post-bachelor’s training degree (in training or completed)  No  Yes | Reference  1.59 | .92 - 2.73 | .09 |
| Employment arrangement  Employed by a general practice or self-employed  On a secondment basis | Reference  **.58** | .36 - .92 | .02 |
| Work experience as a GP-MHP in years  <2  2-4  4-8  >8 | Reference  1.51  .75  1.05 | .88 – 2.57  .50 – 1.13  .71 – 1.54 | .13  .16  .82 |
| Number of consultations on an average  eight-hour working day  >10 face to face consults  <10 face to face consults | Reference  .99 | .71 - 1.37 | .82 |
| Work experience as a mental health professional in years | 1.01 | .97 - 1.06 | .63 |
| Working hours a week as a GP-MHP  <16  16-28  ≥28 | Reference  1.03  .66 | .67 - 1.58  .42 - 1.03 | .90  .07 |
| Having received continuing training in hours (in the previous 12 months)  <20  ≥20 | Reference  1.30 | .89 - 1.89 | .17 |
| Having received intervision or supervison (in the previous 12 months)  <6  ≥6 | Reference  **.63** | .44 - .91 | .01 |
| *Patient-related confounders* |  |  |  |
| Age | **1.02** | 1.01 - 1.04 | .00 |
| Gender  Female  Male | Reference  .99 | .66 - 1.47 | .94 |
| Educational level  Low  Middle  High | Reference  1.25  .90 | .85 - 1.82  .65 - 1.25 | .26  .54 |
| Number of consultations with GP-MHP  1-2  3  4  5  ≥6 | Reference  **2.43**  .67  1.02  1.15 | 1.56 - 3.76  .45 – 1.01  .68 – 1.53  .76 – 1.73 | .00  .06  .94  .51 |
| Still receiving care from GP-MHP  No  Yes | Reference  1.04 | .70 - 1.53 | .85 |

*Note.* Satisfaction grade threshold: >8

Table 5 revealed that the type of employment of the GP-MHP has a significant effect on the overall satisfaction grade. patients of GP-MHP who are employed on a secondment basis are less satisfied than patients of GP-MHPs who are employed by a general practice or are self-employed (OR=.58, *p* <.05). Furthermore, patients of GP-MHPs who received 6 or more supervision or intervision sessions in the previous 12 months are less likely to be more satisfied about their GP-MHP compared with patients of GP-MHPs who received less than 6 intervision or supervision sessions. (OR=.63, *p* <.05). Regarding the selected patient-related confounders, age and the number of consultations the patients have had with the GP-MHP were found to be significantly related to satisfaction grade. With regard to the results for age, this means that a one year increase regarding age increases the odds of patient satisfaction by 1.02, so 2% (OR=1.02, *p* <.01). Thus, older age of patients significantly increased the odds of being more satisfied. It is also shown that patients that have had 3 consultations with their GP-MHP are more satisfied than patients who had 1 or 2 (OR=2.43, *p* <.01).

Based on the results shown in table 4, the hypothesis that if a GP-MHP is employed by a general practice that the patient satisfaction is higher than if the GP-MHP is employed on a secondment basis (H2) is confirmed. Having a nursing background positively influences patient satisfaction (H1), the lower the number of face-to-face consultations the GP-MHP has, the higher the patient satisfaction (H3). having a completed a GP-MHP’s post-bachelor’s training degree improves patient satisfaction (H4) and the higher the number of years the GP-MHP has been working as his or her contemporary function, the higher the patient satisfaction. (H5) are rejected.

### Overall satisfaction score

**Table 6.** **Multilevel logistic regression analysis predicting the overall satisfaction score with GP-MHP characteristics and patient-related confounders (N=629)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | OR | 95% CI | | *P* |
|  |  |  |  |  |
| *GP-MHP characteristics* |  |  |  |  |
| Age | 1.02 | .99 | - 1.05 | .13 |
| Nursing background  No  Yes | Reference  .79 | .48 | - 1.29 | .34 |
| Obtained a GP-MHP post-bachelor’s training degree (in training or completed)  No  Yes | Reference  **1.44** | 1.00 | - 2.07 | .05 |
| Employment arrangement  Employed by a general practice or self-employed  On a secondment basis | Reference  .92 | .60 | - 1.41 | .70 |
| Work experience as a GP-MHP in years  <2  2-4  4-8  >8 | Reference  1.25  .71  **.61** | .79  .47  .41 | - 2.00  - 1.09  - .91 | .34  .12  .02 |
| Number of consultations on an average  eight-hour working day  >10 face to face consults  <10 face to face consults | Reference  **1.41** | 1.08 | - 1.84 | .01 |
| Type of consultation with GP  Only ad hoc consultation  Fixed (combined with ad hoc) | Reference  **1.51** | 1.01 | - 2.25 | .05 |
| Using questionnaires to support problem clarification or triage  Sometimes, rarely or never  always or often | Reference  **.58** | .41 | - .82 | .00 |
| Using questionnaires to monitor outcomes  Sometimes, rarely or never  always or often | Reference  1.37 | .93 | - 2.02 | .11 |
| Having received intervision or supervison (in the previous 12 months)  <6  ≥6 | Reference  .74 | .53 | - 1.02 | .06 |
| *Patient-related confounders* |  |  |  |  |
| Age | 1.01 | 1.00 | - 1.02 | .07 |
| Gender  Female  Male | 1.05 | .72 | - 1.51 | .81 |
| Educational level  Low  Middle  High | Reference  .81  1.00 | .57  .75 | - 1.15  - 1.34 | .24  .99 |
| Number of consultations with GP-MHP  1-2  3  4  5  ≥6 | Reference  **1.52**  1.21  .87  1.08 | 1.01  .83  .59  .74 | - 2.29  - 1.76  - 1.27  - 1.56 | .04  .33  .47  .70 |
| Still receiving care from GP-MHP  No  Yes | Reference  1.14 | .79 | - 1.63 | .49 |

*Note.* Overall satisfaction score threshold: >95.

Table 6 shows the results of the model predicting overall satisfaction score. Patients with a GP-MHP who are in training or completed a post-bachelor’s training degree are more satisfied than patients with GP-MHPs without a post-bachelor’s training degree (OR=1.44, *p* =.05). Patients of GP-MHPs who have more than 8 years work experience are less satisfied compared to patients of GP-MHPs who have less than 2 years of work experience (OR=.61, *p* <.05). Moreover, patients of GP-MHPs with less than 10 face to face consultations on an average work day are significantly more likely to be more satisfied than patients of GP-MHPs with 10 or more face to face consultations on an eight hour work day (OR=1.41, *p* <.05). Next, patients of GP-MHPs with fixed consults with the GP are more satisfied than patients of GP-MHPs with only ad hoc consult (OR=1.51, *p* = .05). It is also shown that patients who are treated by a GP-MHP who always or often uses questionnaires to support problem clarification or triage are less satisfied than patients of GP-MHPs that sometimes, rarely or never use questionnaires to support problem clarification or triage (OR=.58, *p* <.01). Next to GP-MHP characteristics, the only patient-related confounder that is significant is the number of consultations patients have had with the GP-MHP. Patients who have had 3 consultations with their GP-MHP have significantly higher odds of being satisfied thanthan patients that have had 1 or two consultations with their GP-MHP (OR=1.53, *p* <.01).

The hypotheses that the lower the number of face-to-face consultations the GP-MHP has, the higher the patient satisfaction (H3) and having a completed a GP-MHP’s post-bachelor’s training degree improves patient satisfaction (H4) are confirmed. Having a nursing background positively influences patient satisfaction (H1), if a GP-MHP is employed by a general practice that the patient satisfaction is higher than if the GP-MHP is employed on a secondment basis (H2), the lower the number of face-to-face consultations the GP-MHP has, the higher the patient satisfaction and the higher the number of years the GP-MHP has been working as his or her contemporary function, the higher the patient satisfaction. (H5) are rejected.

### Domain regression analyses

Regression analysis analyzing the relationship between the 4 domains and predictors was performed.

Participation within the shared decision making process

Patients of GP-MHPs who were seconded had significantly lower odds of being satisfied about the shared decision making process compared to patients of GH-MHPs who were employed by a general practice or self-employed (OR=.54, *p* <.05). The last significant predictor is the age of patients. The older the patient, the more satisfied the patient will be (OR=1.03,  *p* <.01). The overall results are shown in Supplemental Table 2, Appendix C

Accessibility and the availability of the GP-MHP

Patients of GP-MHPs who completed a post-bachelor’s training degree are more satisfied in comparison with patients of GP-MHPs that did not complete a post-bachelor’s training degree (OR = 1.71 *p* <.01). Next, patients who are treated by a GP-MHP with less than 10 face-to-face consultations are more satisfied than patients of GP-MHPs who have 10 or more face-to-face consultations on an average work day (OR=1.46, *p* <.01). Next, patients with GP-MHPs who have fixed consults with the GP are significantly more likely to be satisfied than patients of GP-MHPs who only have ad hoc consultations (OR=1.77, *p* <.01). Patients of GP-MHP that always or often uses questionnaires to support problem clarification or triage have significantly lower odds of being satisfied than patients of GP-MHP that sometimes, rarely or never use questionnaires to support problem clarification or triage (OR=.56, *p* <.01). The last significant predictor is the age of patients. The older the patient, the more satisfied the patient will be (OR=1.03,  *p* <.01). The overall results are shown in Supplemental Table 3, Appendix C.

Interaction and communication with the GP-MHP

Only patient-related confounders seem to be significant predictors of satisfaction about the interaction and communication with the GP-MHP. The first effect to be revealed is the influence of the number of consultations a patient had with their GP-MHP. Patients who had 3 consultations with the GP-MHP were significantly more likely to be satisfied than patients who had 1 or 2 consultations with their GP-MHP (OR=3.65, *p* <.05). Patients who have received 6 or more consultations are also more satisfied with the interaction and communication with the GP-MHP than patients who received 1 or 2 consultations (OR=3.06, *p* <.05). It is also shown that patients who still receive care from the GP-MHP are more satisfied than patients who do not receive care anymore (OR=5.52, *p* <.01). The last significant predictor is the age of patients. The older the patient, the more satisfied the patient will be (OR=1.03,  *p* <.01). The overall results are shown in Supplemental Table 4 , Appendix C.

The support of the GP-MHP in mental health recovery

It is significantly more likely for patients of GP-MHPs who completed a post-bachelor’s training degree to be satisfied than patients of GP-MHPs who did not complete a post-bachelor’s training degree (OR=1.75, *p* <.01). It is also revealed that patients of GP-MHPs who work on a secondment basis are less satisfied recovery than patients of GP-MHPs who are employed by the general practice or are self-employed (OR=.46, *p* <.01). Patients of GP-MHPs who have between 2 and 4 years of work experience in their contemporary function are significantly more likely to be satisfied than patients of GP-MHPs who have less than 2 years of work experience (OR=1.96, *p* <.05). Patients of GP-MHPs who have received 6 or more intervision or supervision sessions in the previous 12 months are less satisfied than patients of GP-MHPs who received less than 6 intervision or supervision sessions(OR=.66, *p* <.05). Lastly, patients who had 3 consultations with the GP-MHP were significantly more likely to be satisfied than patients who had 1 or 2 consultations with their GP-MHP (OR=1.59, *p* <.05). The overall results are shown in Supplemental Table 5, Appendix C.

Hypotheses testing

If a GP-MHP is employed by a general practice that the patient satisfaction is higher than if the GP-MHP is employed on a secondment basis (H2) is confirmed in the domains measuring patient satisfaction about the participation within the shared decision making process and the support of the GP-MHP in mental health recovery. The other domains reject this hypothesis. The hypotheses that the lower the number of face-to-face consultations the GP-MHP has, the higher the patient satisfaction (H3) is confirmed in the domain measuring patient satisfaction about the accessibility and availability of the GP-MHP. Having a completed a GP-MHP’s post bachelor’s degree improves patient satisfaction (H4) is confirmed in the domains measuring patient satisfaction about the accessibility and availability of the GP-MHP and the support of the GP-MHP in mental health recovery. The other domains reject these hypotheses. The higher the number of years the GP-MHP has been working as his or her contemporary function, the higher the patient satisfaction (H5) is only partially confirmed in the domain measuring patient satisfaction about the support of the GP-MHP in mental health recovery. The hypotheses that having a nursing background positively influences patient satisfaction (H1) and is rejected in all domains.

# 

# Conclusion/Discussion

Because of the relative novelty of the GP-MHP function and the additional lack of scientific literature about the GP-MHP, this study was of explorative character. The aim of this study was therefore to determine *whether characteristics of the professional and function GP-MHP are associated with patient satisfaction regarding the care received from a GP-MHP.* The complementing research question that is answered in this study is ‘*which GP-MHP related characteristics have an influence on patient satisfaction?’.* To answer this question, quantitative research using questionnaires was conducted. Data from GP-MHPs and their patients was used to analyze the relationship between GP-MHP characteristics and patient satisfaction. After analyzing the descriptive statistics of this study, it can be concluded that patients of GP-MHPs are in general very satisfied with the care that they receive from their GP-MHP (average satisfaction grade = 7.8, average overall satisfaction score = 89.1). Hence, the sample distributions for all satisfaction measurements were skewed. After establishing the levels of patient satisfaction, the influence of GP-MHP characteristics and patient-related confounders were analyzed.

Two measures of general patient satisfaction are included in this study. These are the satisfaction grade and an overall satisfaction score. Before discussing the conclusions of this study, it is important to note these measures are created in different ways. The satisfaction grade is a number on a scale from1/10 that represent how satisfied they are with their GP-MHP, while the overall satisfaction score is calculated by taking the mean average of multiple questions that measure different aspects of patient satisfaction. It is possible that this difference could lead to a difference in which GP-MHP characteristics and patient-related confounders influence patient satisfaction.

First of all, a positive link between having a nursing background and patient satisfaction was expected. However, there wasno significant difference found in patient satisfaction between GP-MHPs with and without a nursing background. This adds to the research findings of Knoops & Kloosterman (2019) who found no significant difference in the satisfaction grade given to different care providers. A reason for the non-existence of this effect could be that both GP-MHPs with a nursing background and without a nursing background received sufficient training to correct for possible differences in the care provided.

The second relation to be expected was between the type of employment and patient satisfaction. Patients of GP-MHPs who are employed on a secondment basis gave a lower satisfaction grade than patients of GP-MHPs who are employed by a general practice or are self-employed. This adds to the idea that GP-MHPs who are seconded by another organisation may have less room to adjust to the needs and wishes of the patients, which influences patient satisfaction. This relation was not found for the overall satisfaction score.

Moreover, an association between the number of face to face consultations a GP-MHP has and the potential negative effect on patient satisfaction was expected. This study concluded that less face-to-face consultations on an average work day increase the overall satisfaction among patients of the GP-MHP. Gross et al. (1998) and Tehrani et al. (2011) found similar results. A possible explanation for this effect is found in the amount of time the GP-MHP sees the patient (Gross et al.) This effect was not found for satisfaction grade.

The fourth assumed relationship that has been tested is between completing a post-bachelor’s training degree and patient satisfaction. The findings of this study concluded that having completed a post-bachelor’s training degree increases the overall satisfaction. This is in line with the idea that the post-bachelor’s training degree follow the core values specified on interaction with the patients of the GP-MHP function profile. A relation between having completed a post-bachelor’s training degree and satisfaction grade has not been found.

The last assumed relationship was that years of work experience have a positive influence on patient satisfaction. Patients of GP-MHPs with more than 8 years of work experience in their contemporary function have a lower overall satisfaction score than patients of GP-MHP with less than 2 years of work experience has been determined, a positive relation between work experience as a GP-MHP and patient satisfaction has not been established. This is in line with the research finding of Laurant et al. (2008) and Chan (2005). They also did not find a significant effect on patient satisfaction.

Next to these five a priori selected GP-MHP characteristics, there were some more GP-MHP characteristics that influence the patient satisfaction. Patients of GP-MHPs who only have ad hoc consults with the GP have a lower overall satisfaction score than patients of GP-MHPs who have fixed consults with the GP. The usage of questionnaires to support problem clarification or triage is also significant. Patients of GP-MHPs who often or always use questionnaires to support problem clarification or triage have a lower overall satisfaction score than patients of GP-MHPs who sometimes, rarely or never use these questionnaires. Lastly, patients of GP-MHPs, who have received 6 or more intervision or supervision sessions in the previous 12 months, gave a lower satisfaction grade than patients of GP-MHPs who received less than 6 intervision or supervision sessions. This effect is not found for overall satisfaction.

Regarding the patient-related confounders in this study, age was found to be a significant positive predictor of patient satisfaction for satisfaction grade. The older a patient gets, the higher the satisfaction grade. This effect has also been found in the study of Batbaatar et al. (2017). According to Batbaatar et al., age seems to be the most consistent demographic variable of patients that seem to have an influence on patient satisfaction.

Another patient related characteristic that seems to be significant in this study is the number of consultations a patient had with their GP-MHP. For both satisfaction grade and overall satisfaction score, patients that have had 3 consultations with their GP-MHP were more satisfied than patients that only had 1 or 2 consultations.

## Limitations and recommendations

A purposive sample has been conducted to gather the participants for this study. A purposive sample is by default not deemed to be representative, because not every person in the population has an equal chance to be included in the sample (Field, 2013). Future research could be focussed on generalization of findings onto the population. An idea to achieve this for instance to use a random sample of some sort to tackle the limitation of no representativeness. Another idea for future research could be to include sensitivity analyses to test the robustness of the outcomes of this study.

The second limitation is the low reliability of the domain measuring patient satisfaction about the interaction and communication with the GP-MHP (Chronbach’s α = .51). This means that the internal consistency of this scale is questionable and interpretations of the outcomes of this aspect should be proceeded with caution.

The third limitation is the possible incorrect application of the LASSO, which could u have led to multicollinearity. Because the analyses in this study are not completely finished yet, nothing has been done to tackle this problem.

The next limitation arose when conducting the regression analyses for the domains measuring: patient satisfaction about the availability and accessibility, the interaction and communication, and the support of the GP-MHP in mental health recovery. Several warnings were displayed. The warnings indicated that the models could not be properly fit, due to problems between the factors and outcomes in the models. This makes interpretation of these models less reliable. Interpretation of these models should be proceeded with caution. Despite these limitations, it does not mean that the results of this study are not valid for using in recommendations and future research. This study has an explorative character, which means that one of the aims of this study is to find a base for further research. Next to conducting future research to gain more insights in which GP-MHP characteristics are related to patient satisfaction, it is also interesting to study how patient satisfaction can be influenced by environmental features regarding the general practice and what the influence of patient satisfaction concerning the GP-MHP is on the quality of care delivered.

Nevertheless, the findings of this study can be used for recommending developments in the function profile of the GP-MHP. The first recommendation for further development of the function of the GP-MHP would be to urge general practices to employ GP-MHPs directly within the practice, instead of hiring GP-MHPs on a secondment basis. The second recommendation would be to decrease the maximum number of face-to-face consultations a GP-MHP has on an average work day. The third recommendation is to require a post-bachelor’s training degree before becoming a GP-MHP. And last but not least, the last recommendation would be to investigate the intervision or supervision sessions, because these intervision and supervision sessions seem to have a negative effect on patient satisfaction.

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# Appendix

## A: Satisfaction questionnaire

Eerst volgen enkele algemene vragen. Daarna volgen de vragen naar uw ervaringen met de hulp van de praktijkondersteuner GGZ.

*Wat is uw leeftijd?*

*... jaar*

*U bent een:*

*O Vrouw O Man*

*Wat is de hoogste school of opleiding die u met een diploma heeft afgerond, of die u op dit moment volgt?*

*O Helemaal geen onderwijs gevolgd*

*O Basisonderwijs, lagere school of een gedeelte daarvan*

*O Lager beroepsonderwijs, VMBO-beroepsgerichte leerweg, praktijk onderwijs (LBO, LTS, LHNO, LEAO, LAO, LAVO, huishoudschool, INHO, (I)VBO)*

*O Middelbaar voortgezet onderwijs (MAVO, VMBO-gemengde/theoretische leerweg, (M)ULO, middenschool, 3 jaar HAVO of VWO)*

*O Middelbaar beroepsopleiding (MBO)*

*O Hoger voortgezet onderwijs (HAVO, Atheneum, VWO, gymnasium, lyceum) O Hoger beroepsopleiding (HBO)*

*O Wetenschappelijk onderwijs (Universiteit) O Anders, namelijk:*

*O Weet niet*

*Krijgt u op dit moment nog hulp van de praktijkondersteuner GGZ?*

*O Ja O Nee*

*Hoeveel afspraken heeft u gehad?*

*…*

Nu volgen vragen over de hulp van de praktijkondersteuner GGZ. Beantwoordt de vragen vanuit uw eigen ervaringen. Er zijn geen goede of foute antwoorden.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | *Ja* | *Nee* | *Weet niet* | *Niet van toepassing* |
| *Is duidelijk welke hulp de praktijkondersteuner u geeft?* | |  |  |  |  |
| *Is duidelijk waarom de huisarts u naar de*  *praktijkondersteuner heeft gestuurd?* | |  |  |  |  |
| *Bespreekt de praktijkondersteuner het doel van de hulp*  *met u?* | |  |  |  |  |
| *Kunt u meebeslissen over welke hulp u krijgt van de*  *praktijkondersteuner?* | |  |  |  |  |
| *Bent u het eens met het doel van de hulpverlening door de*  *praktijkondersteuner?* | |  |  |  |  |
| *Kon u snel een eerste afspraak maken met de*  *praktijkondersteuner?* | |  |  |  |  |
| *Vertrouwt u de praktijkondersteuner?* | |  |  |  |  |
| *Vindt u dat de praktijkondersteuner respectvol met u*  *omgaat?* | |  |  |  |  |
| *Voelt u zich goed gesteund door de praktijkondersteuner?* | |  |  |  |  |
| *Kunt u vaak genoeg afspreken met de*  *praktijkondersteuner?* | |  |  |  |  |
| *Vindt u de tijd voor een gesprek lang genoeg?* | |  |  |  |  |
| *Bent u tevreden over wat de hulp oplevert?* | |  |  |  |  |
| *Krijgt u door de hulp meer grip op uw problemen?* | |  |  |  |  |
| *Gaat u door de hulp beter om met dingen waar u eerst*  *problemen mee had?* | |  |  |  |  |
| *Regelt de praktijkondersteuner het doorsturen naar een*  *andere hulpverlener goed?* | |  |  |  |  |
| *Welk rapportcijfer geeft u aan de hulp door de praktijkondersteuner?* | *Vul een cijfer in van 1 tot 10. Een 1 betekent ‘heel erg slecht’, en een 10 ‘uitstekend’ ……..* | | | | |

Wilt u nog iets anders zeggen over de hulp van de praktijkondersteuner GGZ?

……………………………………………………………………………………………………………………………………………..

………………………………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………………………………

……………………………………………………………………………………………………………………………………………….

*Tot slot: heeft iemand u geholpen bij het invullen van de vragen?*

*O Nee*

*O Ja , namelijk:*

*O Mijn partner*

*O Mijn dochter/zoon*

*O Mijn vader/moeder*

*O Een ander familielid*

*O Een vriend/kennis*

*O Een hulpverlener*

*O Anders, nl. ...............................................................................*

**Bedankt voor uw tijd!**

## B: Lasso regression results

**Supplemental Table 1 Selection of GP-MHP-related characteristics and patient-related confounders**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A priori** | **LASSO** | | **Final** | |
|  | **Satisfaction grade (SG) &**  **Overall satisfaction score (OSS)** | **SG** | **OSS** | **SG** | **OSS** |
| ***Characteristics of the professional and function GP-MHP*** | | | | | |
| Age |  |  | √ |  | √ |
| Gender |  |  |  |  |  |
| Nursing background | √ |  |  | √ | √ |
| GP-MHP post-bachelor’s training degree (in progress or completed) | √ | √ | √ | √ | √ |
| Work experience as a GP-MHP | √ | √ | √ | √ | √ |
| Work experience as a mental health care professional |  | √ |  | √ |  |
| Working hours per week as a GP-MHP |  | √ |  | √ |  |
| Employment arrangement | √ | √ | √ | √ | √ |
| Number of consultations on an average 8-hour working day | √ |  | √ | √ | √ |
| Regular consultation moments with GP |  |  | √ |  | √ |
| Average waiting time for new patients is <2 weeks |  |  |  |  |  |
| Using questionnaires always or often to support problem clarification or triage |  |  | √ |  | √ |
| Using questionnaires always or often to monitor outcomes |  |  | √ |  | √ |
| Having received >20 hours of continuing training (in the previous 12 months) |  | √ |  | √ |  |
| Having received >6 times peer consultation or supervision  (in the previous 12 months) |  | √ | √ | √ | √ |
| ***Patient-related confounders*** | | | | | |
| Age | √ | √ | √ | √ | √ |
| Gender | √ |  |  | √ | √ |
| Educational level |  | √ | √ | √ | √ |
| Number of consultations with GP-MHP |  | √ | √ | √ | √ |
| Still receiving care from GP-MHP |  | √ | √ | √ | √ |
|  | N= 7 | N=11 | N= 13 | N= 14 | K= 15 |

## C: Multilevel logistic regression analyses predicting the aspects of satisfaction of patients with GP-MHP and patient-related confounders

## Supplemental Table 2. Multilevel logistic regression analyses predicting the satisfaction about the participation within the shared decision making process of patients with GP-MHP characteristics and patient-related confounders (N=629).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | OR | 95% CI | | *p* |
| *GP-MHP characteristics* |  |  | |  |
| Age | 1.02 | .99 | - 1.05 | .24 |
| Nursing background  No  Yes | Reference  .99 | .57 | - 1.72 | .96 |
| Obtained a GP-MHP post-bachelor’s training degree (in training or completed)  No  Yes | Reference  1.33 | .89 | - 2.01 | .17 |
| Employment arrangement  Employed by a general practice or self-employed  On a secondment basis | Reference  **.54** | .33 | - .88 | .01 |
| Work experience as a GP-MHP in years  <2  2-4  4-8  ≥8 | Reference  1.31  .84  .97 | .78  .52  .61 | - 2.21  - 1.36  - 1.52 | .31  .48  .88 |
| Number of consultations on an average  eight-hour working day  >10 face to face consults  <10 face to face consults | Reference  .91 | .67 | - 1.24 | .56 |
| Type of consultation with GP  Only ad hoc consultation  Fixed (combined with ad hoc) | Reference  .79 | .50 | - 1.26 | .33 |
| Using questionnaires to support problem clarification or triage  Sometimes, rarely or never  Always or often | Reference  .98 | .65 | - 1.47 | .92 |
| Using questionnaires to monitor outcomes  Sometimes, rarely or never  Always or often | Reference  .88 | .57 | ­- 1.36 | .55 |
| Having received intervision or supervison (in the previous 12 months)  <6  ≥6 | Reference  .75 | .51 | - 1.11 | .15 |
| *Patient-related confounders* |  |  |  |  |
| Age | **1.03** | 1.01 | - 1.04 | .00 |
| Gender  Female  Male | Reference  .77 | .51 | - 1.16 | .21 |
| Educational level  Low  Middle  High | Reference  .93  .92 | .61  .65 | - 1.41  - 1.30 | .72  .63 |
| Number of consultations with GP-MHP  1-2  3  4  5  ≥6 | Reference  1.29  .70  .84  1.34 | .82  .45  .54  .85 | - 2.03  - 1.08  - 1.29  - 2.10 | .27  .11  .42  .21 |
| Still receiving care from GP-MHP  No  Yes | Reference  1.30 | .85 | - 1.97 | .22 |

*Note.* Participation within the shared decision making process threshold: 100.

## Supplemental Table 3. Multilevel logistic regression analyses predicting the satisfaction about the accessibility and availability of the GP-MHP of patients with GP-MHP characteristics and patient-related confounders (N=628)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | OR | 95% CI | | *P* |
|  |  |  |  |  |
| *GP-MHP characteristics* |  |  |  |  |
| Age | 1.02 | .99 | - 1.05 | .21 |
| Nursing background  No  Yes | Reference  .85 | .51 | - 1.42 | .53 |
| Obtained a GP-MHP post-bachelor’s training degree (in training or completed)  No  Yes | Reference  **1.71** | 1.18 | - 2.48 | .00 |
| Employment arrangement  Employed by a general practice or self-employed  On a secondment basis | Reference  .99 | .64 | - 1.54 | .98 |
| Work experience as a GP-MHP in years  <2  2-4  4-8  ≥8 | Reference  1.05  1.03  1.05 | .65  .67  .70 | - 1.69  - 1.61  - 1.57 | .83  .88  .81 |
| Number of consultations on an average  eight-hour working day  >10 face to face consults  <10 face to face consults | Reference  **1.46** | 1.10 | - 1.93 | .01 |
| Type of consultation with GP  Only ad hoc consultation  Fixed (combined with ad hoc) | Reference  **1.77** | 1.16 | - 2.71 | .01 |
| Using questionnaires to support problem clarification or triage  Sometimes, rarely or never  Always or often | Reference  **.56** | .39 | - .80 | .00 |
| Using questionnaires to monitor outcomes  Sometimes, rarely or never  Always or often | Reference  1.16 | .78 | - 1.72 | .47 |
| Having received intervision or supervison (in the previous 12 months)  <6  ≥6 | Reference  1.02 | .73 | - 1.42 | .93 |
| *Patient-related confounders* |  |  |  |  |
| Age | **1.03** | 1.01 | - 1.04 | .00 |
| Gender  Female  Male | Reference  1.27 | .87 | - 1.88 | .22 |
| Educational level  Low  Middle  High | Reference  .76  .97 | .52  .71 | - 1.10  - 1.32 | .14  .86 |
| Number of consultations with GP-MHP  1-2  3  4  5  ≥6 | Reference  1.28  1.11  .93  1.00 | .83  .75  .63  .68 | - 1.97  - 1.64  - 1.37  - 1.47 | .26  .61  .71  .99 |
| Still receiving care from GP-MHP  No  Yes | Reference  .97 | .67 | - 1.42 | .88 |

*Note.* Availability and accessibility of the GP-MHP threshold: 100. This model showed the following warning: boundary (singular) fit: see ?isSingular.

## Supplemental Table 4. Multilevel logistic regression analyses predicting the satisfaction about the interaction and communication with the GP-MHP of patients with GP-MHP characteristics and patient-related confounders (N=626).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | OR | 95% CI | | *P* |
|  |  |  |  |  |
| *GP-MHP characteristics* |  |  |  |  |
| Age | 1.00 | .94 | - 1.06 | 1.00 |
| Nursing background  No  Yes | Reference  1.68 | .60 | - 4.69 | .32 |
| Obtained a GP-MHP post-bachelor’s training degree (in training or completed)  No  Yes | Reference  1.06 | .50 | - 2.25 | .88 |
| Employment arrangement  Employed by a general practice or self-employed  On a secondment basis | Reference  .50 | .19 | - 1.33 | .16 |
| Work experience as a GP-MHP in years  <2  2-4  4-8  ≥8 | Reference  1.03  1.14  1.11 | .37  .47  .48 | - 2.82  - 2.78  - 2.56 | .96  .77  .80 |
| Number of consultations on an average  eight-hour working day  >10 face to face consults  <10 face to face consults | Reference  1.19 | .64 | - 2.20 | .59 |
| Type of consultation with GP  Only ad hoc consultation  Fixed (combined with ad hoc) | Reference  1.67 | .69 | - 4.02 | .25 |
| Using questionnaires to support problem clarification or triage  Sometimes, rarely or never  Always or often | Reference  .64 | .30 | - 1.35 | .24 |
| Using questionnaires to monitor outcomes  Sometimes, rarely or never  Always or often | Reference  .86 | .39 | - 1.91 | .71 |
| Having received intervision or supervison (in the previous 12 months)  <6  ≥6 | Reference  .87 | .42 | - 1.82 | .72 |
| *Patient-related confounders* |  |  |  |  |
| Age | **1.03** | 1.01 | - 1.06 | .01 |
| Gender  Female  Male | Reference  .98 | .43 | - 2.20 | .95 |
| Educational level  Low  Middle  High | Reference  1.09  Reference  .90 | .48  .46 | - 2.47  - 1.76 | .84  .76 |
| Number of consultations with GP-MHP  1-2  3  4  5  ≥6 | Reference  **3.65**  .91  1.56  **3.09** | 1.39  .31  .72  .98 | - 9.60  - 2.72  - 3.38  - 9.76 | .01  .87  .26  .05 |
| Still receiving care from GP-MHP  No  Yes | Reference  **5.52** | 2.08 | - 14.64 | .00 |

*Note.* Interaction and communication with the GP-MHP threshold: 100. This model showed the following warning: boundary (singular) fit: see ?isSingular.

## Supplemental Table 5. Multilevel logistic regression analyses predicting the satisfaction about the support of the GP-MHP in mental health of patients with GP-MHP characteristics and patient-related confounders (N=626).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | OR | 95% CI | | *P* |
|  |  |  |  |  |
| *GP-MHP characteristicsteristics* |  |  |  |  |
| Age | 1.00 | 0.97 | - 1.03 | 0.82 |
| Nursing background  No  Yes | Reference  1.17 | 0.70 | - 1.96 | 0.54 |
| Obtained a GP-MHP post-bachelor’s training degree (in training or completed)  No  Yes | Reference  **1.75** | 1.19 | - 2.58 | 0.00 |
| Employment arrangement  Employed by a general practice or self-employed  On a secondment basis | Reference  **0.46** | 0.29 | - 0.72 | 0.00 |
| Work experience as a GP-MHP in years  <2  2-4  4-8  ≥8 | Reference  **1.96**  0.65  0.92 | 1.20  0.41  0.61 | - 3.19  - 1.01  - 1.39 | 0.01  0.06  0.69 |
| Number of consultations on an average  eight-hour working day  >10 face to face consults  <10 face to face consults | Reference  0.99 | 0.75 | - 1.31 | 0.97 |
| Type of consultation with GP  Only ad hoc consultation  Fixed (combined with ad hoc) | Reference  1.35 | 0.89 | - 2.06 | 0.16 |
| Using questionnaires to support problem clarification or triage  Sometimes, rarely or never  Always or often | Reference  0.79 | 0.55 | - 1.13 | 0.20 |
| Using questionnaires to monitor outcomes  Sometimes, rarely or never  Always or often | Reference  1.09 | 0.73 | - 1.63 | 0.67 |
| Having received intervision or supervison (in the previous 12 months)  <6  ≥6 | Reference  **0.66** | 0.47 | - 0.93 | 0.02 |
| *Patient-related confounders* |  |  |  |  |
| Age | 1.01 | 0.99 | - 1.02 | 0.41 |
| Gender  Female  Male | Reference  1.14 | 0.79 | - 1.65 | 0.49 |
| Educational level  Low  Middle  High | Reference  1.11  1.05 | 0.78  0.78 | - 1.59  - 1.41 | 0.55  0.75 |
| Number of consultations with GP-MHP  1-2  3  4  5  ≥6 | Reference  **1.59**  0.92  1.03  1.18 | 1.06  0.63  0.71  0.81 | - 2.40  - 1.35  - 1.52  - 1.72 | 0.03  0.67  0.86  0.38 |
| Still receiving care from GP-MHP  No  Yes | Reference  1.18 | 0.82 | - 1.70 | 0.37 |

*Note.* The support of the GP-MHP in mental health threshold: 100. This model showed the following warning: Model is nearly unidentifiable: very large eigenvalue - Rescale variables?

## D: Syntax

### factoranalysis

\*De analyse die wordt meegenomen is de Varimax met4 fixed factors en 13 items

op basis hiervan wordt er geinterpreteerd\*

\*Nieuwe varimax paf 13 items fixed factors 4 analyse + factorscores <<<< dit is de analyse die wordt gebruikt in de interpretatie.

DATASET ACTIVATE DataSet1.

FACTOR

/VARIABLES V5\_\_01 V5\_\_03 V5\_\_04 V5\_\_05 V5\_\_06 V5\_\_07 V5\_\_08 V5\_\_09 V5\_\_10 V5\_\_11 V5\_\_12 V5\_\_13

V5\_\_14

/MISSING LISTWISE

/ANALYSIS V5\_\_01 V5\_\_03 V5\_\_04 V5\_\_05 V5\_\_06 V5\_\_07 V5\_\_08 V5\_\_09 V5\_\_10 V5\_\_11 V5\_\_12 V5\_\_13

V5\_\_14

/PRINT UNIVARIATE INITIAL CORRELATION EXTRACTION ROTATION

/FORMAT SORT BLANK(.30)

/CRITERIA FACTORS(4) ITERATE(25)

/EXTRACTION PAF

/CRITERIA ITERATE(25)

/ROTATION VARIMAX

/SAVE REG(ALL)

/METHOD=CORRELATION.

\*Uit bovenstaande analyse blijkt dat het nog steeds niet duidelijk is hoe je het beste de variabeln over de factoren kan verdelen, Verdere analyses worden hieronder uitgevoerd

------------------------------------------------------------------------------------------------------------------------

\*spearman correlatiematrix tussen alle variabelen.

NONPAR CORR

/VARIABLES=V5\_\_01 V5\_\_02 V5\_\_03 V5\_\_04 V5\_\_05 V5\_\_06 V5\_\_07 V5\_\_08 V5\_\_09 V5\_\_10 V5\_\_11 V5\_\_12

V5\_\_13 V5\_\_14 V5\_\_15

/PRINT=SPEARMAN TWOTAIL NOSIG

/MISSING=PAIRWISE.

\*descriptives vier variabelen.

DESCRIPTIVES FAC1\_1 FAC2\_1 FAC3\_1 FAC4\_1.

FREQUENCIES FAC1\_1 FAC2\_1 FAC3\_1 FAC4\_1.

\*correlatiematrix v9/factorscores.

NONPAR CORR

/VARIABLES= V5\_\_09 V5\_\_12 FAC1\_1 FAC2\_1 FAC3\_1 FAC4\_1

/PRINT=SPEARMAN TWOTAIL NOSIG

/MISSING=PAIRWISE.

\*correlatiematrix alle variabelen uit factor 1/factorscores.

NONPAR CORR

/VARIABLES= V5\_\_09 FAC1\_1 FAC2\_1 FAC3\_1 FAC4\_1 V5\_\_12 V5\_\_03 V5\_\_13 V5\_\_08

/PRINT=SPEARMAN TWOTAIL NOSIG

/MISSING=PAIRWISE.

**Syntax reliability analysis**

\*hieronder staan de chronbach's alpha aan de hand van de definitieve domeinen

------------------------------------------------------------------------------

\*domein B.

RELIABILITY

/VARIABLES=V5\_\_01 V5\_\_03 V5\_\_04 V5\_\_05

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS VARIANCE.

\*domein C.

RELIABILITY

/VARIABLES=V5\_\_06 V5\_\_10 V5\_\_11

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS VARIANCE.

\* NIEUW domein D v7 8.

RELIABILITY

/VARIABLES=V5\_\_07 V5\_\_08

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS VARIANCE.

\* NIEUW domein E + v9.

RELIABILITY

/VARIABLES=V5\_\_12 V5\_\_13 V5\_\_14 V5\_\_09

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS VARIANCE.

\*Overall satisfaction score.

RELIABILITY

/VARIABLES=V5\_\_01 V5\_\_02 V5\_\_03 V5\_\_04 V5\_\_05 V5\_\_06 V5\_\_07 V5\_\_08 V5\_\_09

V5\_\_10 V5\_\_11 V5\_\_12 V5\_\_13 V5\_\_14 V5\_\_15

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS VARIANCE.

### Descriptives

\*Compositescore van item 2 doorgeleiding van huisarts naar POH-GGZ

COMPUTE SubA\_N = MEAN (V5\_\_02).

EXECUTE.

\*Compositescore domein informatieverstrekking over/inspraak in de hulpverlening van POH-GGZ

COMPUTE SubB\_N= MEAN (V5\_\_01, V5\_\_03, V5\_\_04, V5\_\_05).

EXECUTE.

\*Compostiescore domein toegankelijkheid en beschikbaarheid van POH-GGZ

COMPUTE SubC\_N = MEAN (V5\_\_06, V5\_\_10, V5\_\_11).

EXECUTE.

\*Compositescore domein interactie en contact met de POH-GGZ

COMPUTE SubD\_N = MEAN (V5\_\_07, V5\_\_08).

EXECUTE.

\*Compositescore domein Resultaat hulpverlening van de POH-GGZ

COMPUTE SubE\_N= MEAN (V5\_\_12, V5\_\_13, V5\_\_14, V5\_\_09).

EXECUTE.

\*Compositescore domein doorgeleiding van POH-GGZ naar andere hulpverlener

COMPUTE SubF\_N= MEAN (V5\_\_15).

EXECUTE.

\*Descriptives subscores zoals voorafopgesteld.

DESCRIPTIVES SubD\_interact\_contact

SubE\_result\_hulpverl.

\*patienten van pohggz <3 verwijderen.

FREQUENCIES POH\_reference.

SELECT IF (POH\_reference ~= 'pg46' & POH\_reference ~= 'pg55' & POH\_reference ~= 'pg56' &

POH\_reference ~= 'pg76' & POH\_reference ~= 'pg89' & POH\_reference ~= 'pg75').

\*Descriptives subscores aan de hand van de factoranalyses.

DESCRIPTIVES SubA\_N SubB\_N SubC\_N SubD\_N SubE\_N SubF\_N.

FREQUENCIES SubA\_N SubB\_N SubC\_N SubD\_N SubE\_N SubF\_N.

\*Des rapportcijfer.

DESCRIPTIVES v6.

FREQUENCIES v6.

\*Des totaalscore.

FREQUENCIES Satiscore15.

DESCRIPTIVES Satiscore15.

\*Des patientkenmerken.

DESCRIPTIVES Leeftijd\_ptn.

FREQUENCIES Leeftijd\_ptn\_cat.

FREQUENCIES Geslacht\_ptn.

FREQUENCIES Opl\_aang\_ptn\_cat.

DESCRIPTIVES Afspraken\_ptn.

FREQUENCIES Afspraken\_ptn\_N\_cat

FREQUENCIES Hulp\_afg\_ptn.

DATASET ACTIVATE DataSet1.

FREQUENCIES VARIABLES=Opl\_aang\_ptn Afspraken\_ptn Afspraken\_ptn\_cat v6 SubF\_N SubA\_N SubB\_N SubC\_N

SubD\_N SubE\_N Satiscore15 filter\_$

/STATISTICS=STDDEV RANGE MEAN MEDIAN MODE SUM

/ORDER=ANALYSIS.

EXAMINE VARIABLES=SubA\_N SubB\_N SubC\_N SubD\_N SubE\_N SubF\_N Satiscore15 v6

/PLOT NONE

/STATISTICS DESCRIPTIVES

/CINTERVAL 95

/MISSING PAIRWISE

/NOTOTAL.

\*\_\_\_\_\_\_ syntax poh-ggz kenmerken begint hier\_\_\_\_.

\*respondenten selecteren meer dan 2 patienten.

SELECT IF (Aantal\_patiënten\_per\_POHGGZ >2).

\*Alle descriptives.

DESCRIPTIVES Leeftijd\_POHGGZ.

FREQUENCIES Lft\_POH\_cat.

FREQUENCIES Geslacht\_POHGGZ.

FREQUENCIES opleiding\_achtergrond

Opleiding\_pohggz.

DESCRIPTIVES Years\_MHNP Years\_GGZ.

FREQUENCIES Years\_MHNP\_cat Years\_GGZ\_cat.

DESCRIPTIVES POHGGZ\_uren.

FREQUENCIES POHGGZ\_uren\_cat.

DESCRIPTIVES contactenperda.

FREQUENCIES Contactendag\_cat.

FREQUENCIES Dienstverband\_POH\_DICHOTOOM\_B.

FREQUENCIES VastoverlegPOH\_HA.

FREQUENCIES Wachttijd\_minder2w.

DESCRIPTIVES Aantal\_patiënten\_per\_POHGGZ.

FREQUENCIES Aantal\_patiënten\_per\_POHGGZ.

FREQUENCIES Instrument\_triage Instrument\_monitoring Uren\_nascholing N\_Inter\_supervisie.

\*Descriptives onafhankelijke variabelen a priori.

FREQUENCIES opleiding\_achtergrond Opleiding\_pohggz.

DESCRIPTIVES Years\_MHNP Dienstverband\_POH\_DICHOTOOM\_B Contactenperdag.

### Cronstructing dichotomized dependent variables

\*-

Hier is de syntax die ik heb gemaakt om dummyvariabelen te maken van de afhankelijke variabelen

De groep die minder tevreden is heb ik de waarde 0 gegeven en de groep die meer tevreden is de waarde 1

De grenswaardes zijn bepaald aan de hand van histogrammen en frequentieverdelingen. Hierbij is ook gekeken of elke variabele mee kan worden genomen in de hoofdanalyses

----------------------------------------------------------------------------------------------------------------------------

\*Filteren POH-GGZ's en hun patienten die niet zijn gebruikt.

SELECT IF (POH\_reference ~= 'pg46' & POH\_reference ~= 'pg55' & POH\_reference ~= 'pg56' &

POH\_reference ~= 'pg76' & POH\_reference ~= 'pg89' & POH\_reference ~= 'pg75').

\*Histogram Overall satisfaction.

DATASET ACTIVATE DataSet1.

\* Chart Builder.

GGRAPH

/GRAPHDATASET NAME="graphdataset" VARIABLES=Satiscore15 MISSING=LISTWISE REPORTMISSING=NO

/GRAPHSPEC SOURCE=INLINE.

BEGIN GPL

SOURCE: s=userSource(id("graphdataset"))

DATA: Satiscore15=col(source(s), name("Satiscore15"))

GUIDE: axis(dim(1), label("Samengestelde \"overall\" score (15 items)"))

GUIDE: axis(dim(2), label("Frequency"))

GUIDE: text.title(label("Simple Histogram of Samengestelde \"overall\" score (15 items) "))

ELEMENT: interval(position(summary.count(bin.rect(Satiscore15))), shape.interior(shape.square))

END GPL.

\*Frequencies Overall satisfaction.

FREQUENCIES Satiscore15.

\*histogram rapportcijfer\*

\* Chart Builder.

GGRAPH

/GRAPHDATASET NAME="graphdataset" VARIABLES=v6 COUNT()[name="COUNT"] MISSING=LISTWISE

REPORTMISSING=NO

/GRAPHSPEC SOURCE=INLINE.

BEGIN GPL

SOURCE: s=userSource(id("graphdataset"))

DATA: v6=col(source(s), name("v6"), unit.category())

DATA: COUNT=col(source(s), name("COUNT"))

GUIDE: axis(dim(1), label("Welk rapportcijfer geeft u aan de hulp door de praktijkondersteuner?"))

GUIDE: axis(dim(2), label("Count"))

GUIDE: text.title(label("Simple Histogram Count of Welk rapportcijfer geeft u aan de hulp door ",

"de praktijkondersteuner?"))

SCALE: cat(dim(1), include("1.00", "2.00", "3.00", "4.00", "5.00", "6.00", "7.00", "8.00"

, "9.00", "10.00"))

SCALE: linear(dim(2), include(0))

ELEMENT: interval(position(v6\*COUNT), shape.interior(shape.square))

END GPL.

\*Frequencies rapportcijfer (v6).

FREQUENCIES v6.

\*histogram domein A.

\* Chart Builder.

GGRAPH

/GRAPHDATASET NAME="graphdataset" VARIABLES=SubA\_N COUNT()[name="COUNT"] MISSING=LISTWISE

REPORTMISSING=NO

/GRAPHSPEC SOURCE=INLINE.

BEGIN GPL

SOURCE: s=userSource(id("graphdataset"))

DATA: SubA\_N=col(source(s), name("SubA\_N"), unit.category())

DATA: COUNT=col(source(s), name("COUNT"))

GUIDE: axis(dim(1), label("SubA\_N"))

GUIDE: axis(dim(2), label("Count"))

GUIDE: text.title(label("Simple Histogram Count of SubA\_N"))

SCALE: linear(dim(2), include(0))

ELEMENT: interval(position(SubA\_N\*COUNT), shape.interior(shape.square))

END GPL.

\*Frequencies Domein A.

FREQUENCIES SubA\_N.

\*Histogram domein B.

\* Chart Builder.

GGRAPH

/GRAPHDATASET NAME="graphdataset" VARIABLES=SubB\_N COUNT()[name="COUNT"] MISSING=LISTWISE

REPORTMISSING=NO

/GRAPHSPEC SOURCE=INLINE.

BEGIN GPL

SOURCE: s=userSource(id("graphdataset"))

DATA: SubB\_N=col(source(s), name("SubB\_N"), unit.category())

DATA: COUNT=col(source(s), name("COUNT"))

GUIDE: axis(dim(1), label("SubB\_N"))

GUIDE: axis(dim(2), label("Count"))

GUIDE: text.title(label("Simple Histogram Count of SubB\_N"))

SCALE: linear(dim(2), include(0))

ELEMENT: interval(position(SubB\_N\*COUNT), shape.interior(shape.square))

END GPL.

\*Frequencies Domein B.

FREQUENCIES SubB\_N.

\*Histogram domein C.

GGRAPH

/GRAPHDATASET NAME="graphdataset" VARIABLES=SubC\_N COUNT()[name="COUNT"] MISSING=LISTWISE

REPORTMISSING=NO

/GRAPHSPEC SOURCE=INLINE.

BEGIN GPL

SOURCE: s=userSource(id("graphdataset"))

DATA: SubC\_N=col(source(s), name("SubC\_N"), unit.category())

DATA: COUNT=col(source(s), name("COUNT"))

GUIDE: axis(dim(1), label("SubC\_N"))

GUIDE: axis(dim(2), label("Count"))

GUIDE: text.title(label("Simple Histogram Count of SubC\_N"))

SCALE: linear(dim(2), include(0))

ELEMENT: interval(position(SubC\_N\*COUNT), shape.interior(shape.square))

END GPL.

\*Frequencies domein C.

FREQUENCIES SubC\_N.

\*Histogram domein D.

\* Chart Builder.

GGRAPH

/GRAPHDATASET NAME="graphdataset" VARIABLES=SubD\_N COUNT()[name="COUNT"] MISSING=LISTWISE

REPORTMISSING=NO

/GRAPHSPEC SOURCE=INLINE.

BEGIN GPL

SOURCE: s=userSource(id("graphdataset"))

DATA: SubD\_N=col(source(s), name("SubD\_N"), unit.category())

DATA: COUNT=col(source(s), name("COUNT"))

GUIDE: axis(dim(1), label("SubD\_N"))

GUIDE: axis(dim(2), label("Count"))

GUIDE: text.title(label("Simple Histogram Count of SubD\_N"))

SCALE: linear(dim(2), include(0))

ELEMENT: interval(position(SubD\_N\*COUNT), shape.interior(shape.square))

END GPL.

\*Frequencies domein D.

FREQUENCIES SubD\_N.

\*Histogram domein E.

\* Chart Builder.

GGRAPH

/GRAPHDATASET NAME="graphdataset" VARIABLES=SubE\_N COUNT()[name="COUNT"] MISSING=LISTWISE

REPORTMISSING=NO

/GRAPHSPEC SOURCE=INLINE.

BEGIN GPL.

SOURCE: s=userSource(id("graphdataset"))

DATA: SubE\_N=col(source(s), name("SubE\_N"), unit.category())

DATA: COUNT=col(source(s), name("COUNT"))

GUIDE: axis(dim(1), label("SubE\_N"))

GUIDE: axis(dim(2), label("Count"))

GUIDE: text.title(label("Simple Histogram Count of SubE\_N"))

SCALE: linear(dim(2), include(0))

ELEMENT: interval(position(SubE\_N\*COUNT), shape.interior(shape.square))

END GPL.

\*Frequencies domein E.

FREQUENCIES SubE\_N.

\*Histogram domein F.

\* Chart Builder.

GGRAPH

/GRAPHDATASET NAME="graphdataset" VARIABLES=SubF\_N COUNT()[name="COUNT"] MISSING=LISTWISE

REPORTMISSING=NO

/GRAPHSPEC SOURCE=INLINE.

BEGIN GPL.

SOURCE: s=userSource(id("graphdataset"))

DATA: SubF\_N=col(source(s), name("SubF\_N"), unit.category())

DATA: COUNT=col(source(s), name("COUNT"))

GUIDE: axis(dim(1), label("SubF\_N"))

GUIDE: axis(dim(2), label("Count"))

GUIDE: text.title(label("Simple Histogram Count of SubF\_N"))

SCALE: linear(dim(2), include(0))

ELEMENT: interval(position(SubF\_N\*COUNT), shape.interior(shape.square))

END GPL.

\*Frequencies domein F.

FREQUENCIES SubF\_N.

\*Rapportcijfer.

RECODE v6 (1 2 3 4 5 6 7 = 0) (8 9 10 = 1) (ELSE = SYSMIS) INTO v6\_D.

\*Overall satisfaction.

RECODE Satiscore15 (95 thru Highest = 1) (LOWEST thru 95 = 0) (ELSE = SYSMIS) INTO Satiscore15\_D.

\*Domein A: wanneer gedichotomiseerd heeft dit domein te weinig patienten in de 'minder tevreden'-groep, Ik heb deze variabele toch aangemaakt, omdat de hoofdanalysedummy's zo in ieder geval compleet zijn, of we dit nu gaan gebruiken of niet.

RECODE SubA\_N (100 = 1) (LOWEST thru 99 = 0) (ELSE = SYSMIS) INTO SubA\_ND.

\*Domein B.

RECODE SubB\_N (100 = 1) (LOWEST thru 99 = 0) (ELSE = SYSMIS) INTO SubB\_ND.

\*Domein C.

RECODE SubC\_N (100 = 1) (LOWEST thru 99 = 0) (ELSE = SYSMIS) INTO SubC\_ND.

\*Domein D: wanneer gedichotomiseerd heeft dit domein te weinig patienten in de 'minder tevreden'-groep, Ik heb deze variabele toch aangemaakt, omdat de hoofdanalysedummy's zo in ieder geval compleet zijn, of we dit nu gaan gebruiken of niet.

RECODE SubD\_N (100 = 1) (LOWEST thru 99 = 0) (ELSE = SYSMIS) INTO SubD\_ND .

\*Domein E.

RECODE SubE\_N (100 = 1) (LOWEST thru 99 = 0) (ELSE = SYSMIS) INTO SubE\_ND.

\*Domein F: wanneer gedichotomiseerd heeft dit domein te weinig patienten in de 'minder tevreden'-groep, Ik heb deze variabele toch aangemaakt, omdat de hoofdanalysedummy's zo in ieder geval compleet zijn, of we dit nu gaan gebruiken of niet..

RECODE SubF\_N (100 = 1) (LOWEST thru 99 = 0) (ELSE = SYSMIS) INTO SubF\_ND.

\*frequencies variabelen.

FREQUENCIES SubA\_ND SubB\_ND SubC\_ND SubD\_ND SubE\_ND SubF\_ND Satiscore15\_D

v6\_D

**E: R script**

### Regression analyses

library(ggplot2) # ggplot()

library(lme4) # glmer()

library(Matrix)

library(haven) # read\_spss()

library(tidyverse)

Patienten <- read\_spss("Patienten werkbestand.sav")

### Variabelen niveaus nakijken en goedzetten

Patienten$Years\_MHNP\_cat = as.ordered(Patienten$Years\_MHNP\_cat)

Patienten$Contactendag\_cat = as.ordered(Patienten$Contactendag\_cat)

Patienten$opleiding\_achtergrond = as.factor(Patienten$opleiding\_achtergrond)

Patienten$Opleiding\_pohggz = as.factor(Patienten$Opleiding\_pohggz)

Patienten$Geslacht\_ptn = as.factor(Patienten$Geslacht\_ptn)

Patienten$Dienstverband\_POH\_DICHOTOOM\_B = as.factor(Patienten$Dienstverband\_POH\_DICHOTOOM\_B)

Patienten$POHGGZ\_uren\_cat = as.ordered(Patienten$POHGGZ\_uren\_cat)

Patienten$Dienstverband\_5\_cat = as.factor(Patienten$Dienstverband\_5\_cat)

Patienten$VastoverlegPOH\_HA = as.factor(Patienten$VastoverlegPOH\_HA)

Patienten$Instrument\_triage = as.ordered(Patienten$Instrument\_triage)

Patienten$Instrument\_monitoring = as.ordered(Patienten$Instrument\_monitoring)

Patienten$Uren\_nascholing = as.ordered(Patienten$Uren\_nascholing)

Patienten$N\_Inter\_supervisie = as.ordered(Patienten$N\_Inter\_supervisie)

Patienten$Opl\_aang\_ptn\_cat = as.ordered(Patienten$Opl\_aang\_ptn\_cat)

Patienten$Hulp\_afg\_ptn = as.factor(Patienten$Hulp\_afg\_ptn)

Patienten$Afspraken\_ptn\_N\_cat = as.ordered(Patienten$Afspraken\_ptn\_N\_cat)

## afhankelijke variabelen

Patienten$Satiscore15\_D = as.ordered(Patienten$Satiscore15\_D)

Patienten$v6\_D = as.ordered(Patienten$v6\_D)

Patienten$v6\_DS1 = as.ordered(Patienten$v6\_DS1)

Patienten$v6\_DS2 = as.ordered(Patienten$v6\_DS2)

Patienten$Satiscore15\_DS1 = as.ordered(Patienten$Satiscore15\_DS1)

Patienten$Satiscore15\_DS2 = as.ordered(Patienten$Satiscore15\_DS2)

Patienten$SubB\_ND = as.ordered(Patienten$SubB\_ND)

Patienten$SubB\_NDS1 = as.ordered(Patienten$SubB\_NDS1)

Patienten$SubC\_ND = as.ordered(Patienten$SubC\_ND)

Patienten$SubC\_NDS1 = as.ordered(Patienten$SubC\_NDS1)

Patienten$SubE\_ND = as.ordered(Patienten$SubE\_ND)

Patienten$SubE\_NDS1 = as.ordered(Patienten$SubE\_NDS1)

Patienten$SubD\_ND = as.ordered(Patienten$SubD\_ND)

### onafhankelijke variabelen

# Variabelen adhv a priori selectie (dus voor elk model van toepassing)

class(Patienten$opleiding\_achtergrond)

class(Patienten$Opleiding\_pohggz)

class(Patienten$Leeftijd\_ptn)

class(Patienten$Geslacht\_ptn)

class(Patienten$Years\_MHNP\_cat)

class(Patienten$Dienstverband\_POH\_DICHOTOOM\_B)

class(Patienten$Dienstverband\_5\_cat)

class(Patienten$Contactendag\_cat)

# Variabelen bijgekomen door LASSO regressie

class(Patienten$Leeftijd\_POHGGZ)

class(Patienten$Years\_GGZ)

class(Patienten$POHGGZ\_uren\_cat)

class(Patienten$VastoverlegPOH\_HA)

class(Patienten$Instrument\_triage)

class(Patienten$Instrument\_monitoring)

class(Patienten$Uren\_nascholing)

class(Patienten$N\_Inter\_supervisie)

class(Patienten$Opl\_aang\_ptn\_cat)

class(Patienten$Hulp\_afg\_ptn)

class(Patienten$Afspraken\_ptn\_N\_cat)

### Afhankelijke variabelen

class(Patienten$v6\_D)

class(Patienten$v6\_DS1)

class(Patienten$v6\_DS2)

class(Patienten$Satiscore15\_D)

class(Patienten$Satiscore15\_DS1)

class(Patienten$Satiscore15\_DS2)

class(Patienten$SubB\_ND)

class(Patienten$SubB\_NDS1)

class(Patienten$SubC\_ND)

class(Patienten$SubC\_NDS1)

class(Patienten$SubD\_ND)

class(Patienten$SubE\_ND)

class(Patienten$SubE\_NDS1)

### hieronder controleer ik de referentiegroepen van de afhankelijke variabelen

Patienten$opleiding\_achtergrond

Patienten$Opleiding\_pohggz

Patienten$Leeftijd\_ptn

Patienten$Geslacht\_ptn

Patienten$Years\_MHNP\_cat

Patienten$Dienstverband\_POH\_DICHOTOOM\_B

Patienten$Dienstverband\_5\_cat

Patienten$Contactendag\_cat

# Variabelen bijgekomen door LASSO regressie

Patienten$Leeftijd\_POHGGZ

Patienten$Years\_GGZ

Patienten$POHGGZ\_uren\_cat

Patienten$VastoverlegPOH\_HA

Patienten$Instrument\_triage

Patienten$Instrument\_monitoring

Patienten$Uren\_nascholing

Patienten$N\_Inter\_supervisie

Patienten$Opl\_aang\_ptn\_cat

Patienten$Hulp\_afg\_ptn

Patienten$Afspraken\_ptn\_N\_cat

```

```{r}

### deze functie kan ik gebruiken om de waarden die ik moet rapporteren te laten berekenen door R

extractCoef <- function(lmer.fit, round = FALSE, r = 4) {

if(class(lmer.fit)[1] == "mer" | class(lmer.fit)[1] == "lmerMod") {

Vcov <- vcov(lmer.fit, useScale = FALSE)

betas <- fixef(lmer.fit)

se <- sqrt(diag(Vcov))

zval <- betas / se

pval <- 2 \* pnorm(abs(zval), lower.tail = FALSE)

###############

if(round == T) {

dummi <- round(cbind(betas, se, zval, pval), digits=r)

colnames(dummi) <- c("Estimate", "Std. Error", "t value", "Pr(>|t|)")

dummi

} else {

dummi <- cbind(betas, se, zval, pval)

colnames(dummi) <- c("Estimate", "Std. Error", "t value", "Pr(>|t|)")

dummi

}

} else {

if(round == T) {

round(summary(lmer.fit)$coef, digits=r)

} else {

summary(lmer.fit)$coef

}

}

}

```

## Rapportcijfer

#### Hoofdanalyse geselecteerde variabelen op rapportcijfer met dichotoom dienstverband

```{r message=FALSE}

###regressieformule

Rapportcijfer0 <- glmer(v6\_D ~ 1 + (1|POH\_reference), data = Patienten, family = binomial)

Rapportcijfer1 <- glmer(v6\_D ~ opleiding\_achtergrond + Opleiding\_pohggz + Dienstverband\_POH\_DICHOTOOM\_B + Years\_MHNP\_cat + Contactendag\_cat + Years\_GGZ + POHGGZ\_uren\_cat + Uren\_nascholing + N\_Inter\_supervisie + Leeftijd\_ptn + Geslacht\_ptn + Opl\_aang\_ptn\_cat + Afspraken\_ptn\_N\_cat + Hulp\_afg\_ptn + (1|POH\_reference), data = Patienten, family = binomial)

Rapportcijfer1

Rap1 <- extractCoef(Rapportcijfer1)

se1 <- sqrt(diag(vcov(Rapportcijfer1)))

# tabel 95% CI

RapCI1 <- cbind(Est = fixef(Rapportcijfer1), LL = fixef(Rapportcijfer1) - 1.96 \* se1, UL = fixef(Rapportcijfer1) + 1.96 \* se1)

# Tabel + odds ratio

Raptot1 <- print(exp(RapCI1), digits=3)

(Rapportcijfer1)

# complete tabel afgerond op 2 achter de comma

Rapcomplete1 <- data.frame(Raptot1, Rap1)

Rapcomplete.1 <- round(Rapcomplete1, digits=2)

# checken assumtpie logit linearity

residuals(Rapportcijfer1)

ggplot(data.frame( resid = residuals(Rapportcijfer1)), aes(y = resid)) + geom\_histogram()

```

## Overall satisfaction

#### Hoofdanalyse overall satisfaction dichotoom dienstverband

```{r message=FALSE}

Sati0 <- glmer(Satiscore15\_D ~ 1 + (1|POH\_reference), data = Patienten, family = binomial)

Sati1 <- glmer(Satiscore15\_D ~ Leeftijd\_POHGGZ + opleiding\_achtergrond + Opleiding\_pohggz + Dienstverband\_POH\_DICHOTOOM\_B + Years\_MHNP\_cat + Contactendag\_cat + VastoverlegPOH\_HA + Instrument\_triage + Instrument\_monitoring + N\_Inter\_supervisie + Leeftijd\_ptn + Geslacht\_ptn + Opl\_aang\_ptn\_cat + Afspraken\_ptn\_N\_cat + Hulp\_afg\_ptn +(1|POH\_reference), data = Patienten, family = binomial)

Sat1 <- extractCoef(Sati1)

se11 <- sqrt(diag(vcov(Sati1)))

# table of estimates with 95% CI

SatCI1 <- cbind(Est = fixef(Sati1), LL = fixef(Sati1) - 1.96 \* se11, UL = fixef(Sati1) + 1.96 \* se11)

Sattot1 <- print(exp(SatCI1), digits=3)

(Sati1)

# Complete tabel afgerond

Satcomplete1 <- data.frame(Sattot1, Sat1)

Satcomplete.1 <- round(Satcomplete1, digits=2)

residuals(Sati1)

ggplot(data.frame( resid = residuals(Sati1)), aes(y = resid)) + geom\_histogram()

```

## Domein B

#### Hoofdanalyse Domein B dienstverband dichotoom

```{r message=FALSE}

SubB0 <- glmer(SubB\_ND ~ 1 + (1|POH\_reference), data = Patienten, family = binomial)

SubB1 <- glmer(SubB\_ND ~ Leeftijd\_POHGGZ + opleiding\_achtergrond + Opleiding\_pohggz + Dienstverband\_POH\_DICHOTOOM\_B + Years\_MHNP\_cat + Contactendag\_cat + VastoverlegPOH\_HA + Instrument\_triage + Instrument\_monitoring + N\_Inter\_supervisie + Leeftijd\_ptn + Geslacht\_ptn + Opl\_aang\_ptn\_cat + Afspraken\_ptn\_N\_cat + Hulp\_afg\_ptn +(1|POH\_reference), data = Patienten, family = binomial)

DomB1 <- extractCoef(SubB1)

seb1 <- sqrt(diag(vcov(SubB1)))

# table of estimates with 95% CI

DBHCI1 <- cbind(Est = fixef(SubB1), LL = fixef(SubB1) - 1.96 \* seb1, UL = fixef(SubB1) + 1.96 \* seb1)

DBHtot1 <- print(exp(DBHCI1), digits=3)

(SubB1)

# tabel afgerond

DomeinBHcomplete1 <- data.frame(DBHtot1, DomB1)

DomeinBHcomplete.1 <- round(DomeinBHcomplete1, digits=2)

#checken assumptie logit linearity

residuals(SubB1)

ggplot(data.frame( resid = residuals(SubB1)), aes(y = resid)) + geom\_histogram()

```

## Domein C

#### Hoofdanalyse geselecteerde variabelen op domein C dienstverband dichotoom

```{r warning=FALSE}

SubC0 <- glmer(SubC\_ND ~ 1 + (1|POH\_reference), data = Patienten, family = binomial)

SubC1 <- glmer(SubC\_ND ~ Leeftijd\_POHGGZ + opleiding\_achtergrond + Opleiding\_pohggz + Dienstverband\_POH\_DICHOTOOM\_B + Years\_MHNP\_cat + Contactendag\_cat + VastoverlegPOH\_HA + Instrument\_triage + Instrument\_monitoring + N\_Inter\_supervisie + Leeftijd\_ptn + Geslacht\_ptn + Opl\_aang\_ptn\_cat + Afspraken\_ptn\_N\_cat + Hulp\_afg\_ptn +(1|POH\_reference), data = Patienten, family = binomial)

DomC1 <- extractCoef(SubC1)

sec1 <- sqrt(diag(vcov(SubC1)))

# table of estimates with 95% CI

DCHCI1 <- cbind(Est = fixef(SubC1), LL = fixef(SubC1) - 1.96 \* sec1, UL = fixef(SubC1) + 1.96 \* sec1)

DCHtot1 <- print(exp(DCHCI1), digits=3)

(SubC1)

# complete tabel afgerond

DomeinCHcomplete1 <- data.frame(DCHtot1, DomC1)

DomeinCHcomplete.1 <- round(DomeinCHcomplete1, digits=2)

#checken assumptie logit linearity

residuals(SubC1)

ggplot(data.frame( resid = residuals(SubC1)), aes(y = resid)) + geom\_histogram()

```

## Domein D

## Hoofdanalyse Domein D dienstverband dichotoom

```{r}

SubD0 <- glmer(SubD\_ND ~ 1 + (1|POH\_reference), data = Patienten, family = binomial)

SubD1 <- glmer(SubD\_ND ~ Leeftijd\_POHGGZ + opleiding\_achtergrond + Opleiding\_pohggz + Dienstverband\_POH\_DICHOTOOM\_B + Years\_MHNP\_cat + Contactendag\_cat + VastoverlegPOH\_HA + Instrument\_triage + Instrument\_monitoring + N\_Inter\_supervisie + Leeftijd\_ptn + Geslacht\_ptn + Opl\_aang\_ptn\_cat + Afspraken\_ptn\_N\_cat + Hulp\_afg\_ptn +(1|POH\_reference), data = Patienten, family = binomial)

DomD1 <- extractCoef(SubD1)

sed1 <- sqrt(diag(vcov(SubD1)))

# table of estimates with 95% CI

DDHCI1 <- cbind(Est = fixef(SubD1), LL = fixef(SubD1) - 1.96 \* sed1, UL = fixef(SubD1) + 1.96 \* sed1)

DDHtot1 <- print(exp(DDHCI1), digits=3)

(SubD1)

# complete tabel afgerond

DomeinDHcomplete1 <- data.frame(DDHtot1, DomD1)

DomeinDHcomplete.1 <- round(DomeinDHcomplete1, digits=2)

# Checken assumptie logit linearity

residuals(SubD1)

ggplot(data.frame( resid = residuals(SubD1)), aes(y = resid)) + geom\_histogram()

```

## Domein E

#### Hoofdanalyse domein E dienstverband dichotoom

```{r message=FALSE}

SubE0 <- glmer(SubE\_ND ~ 1 + (1|POH\_reference), data = Patienten, family = binomial)

SubE1 <- glmer(SubE\_ND ~ Leeftijd\_POHGGZ + opleiding\_achtergrond + Opleiding\_pohggz + Dienstverband\_POH\_DICHOTOOM\_B + Years\_MHNP\_cat + Contactendag\_cat + VastoverlegPOH\_HA + Instrument\_triage + Instrument\_monitoring + N\_Inter\_supervisie + Leeftijd\_ptn + Geslacht\_ptn + Opl\_aang\_ptn\_cat + Afspraken\_ptn\_N\_cat + Hulp\_afg\_ptn +(1|POH\_reference), data = Patienten, family = binomial)

DomE1 <- extractCoef(SubE1)

see1 <- sqrt(diag(vcov(SubE1)))

# table of estimates with 95% CI

DEHCI1 <- cbind(Est = fixef(SubE1), LL = fixef(SubE1) - 1.96 \* see1, UL = fixef(SubE1) + 1.96 \* see1)

DEHtot1 <- print(exp(DEHCI1), digits=3)

(SubE1)

# complete tabel afgerond

DomeinEHcomplete1 <- data.frame(DEHtot1, DomE1)

DomeinEHcomplete.1 <- round(DomeinEHcomplete1, digits=2)

#Checken assumptie logit linearity

residuals(SubE1)

ggplot(data.frame(resid = residuals(SubE1)), aes(y = resid)) + geom\_histogram()

```