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Gender-specific characteristics of alcohol use in community-dwelling older adults in Belgium

Y. van Gils MS, PhD ^{a,b,*}, G. Dom MD, PhD ^{a,c}, E. Dierckx MS, PhD ^{b,d}, S.P.J. van Alphen MS, PhD ^{b,e,f}, E. Franck MS, PhD ^a

a University of Antwerp, Faculty of Medicine and Social Sciences, Universiteitsplein 1, 2610 Wilrijk, Belgium

b Vrije Universiteit Brussel, Faculty of Psychology and Educational Sciences, Pleinlaan 2, 1050 Elsene, Belgium

c Collaborative Antwerp Psychiatric Research Institute (CAPRI), University of Antwerp, Belgium.

d Alexianen Zorggroep Tienen, Psychiatric Hospital, Liefdestraat 10, 3300 Tienen, Belgium

e Clinical Centre of Excellence for Personality Disorders in Older Adults, Mondriaan Hospital, J.F. Kennedylaan 301, 6419 XZ Heerlen-Maastricht, The Netherlands

f Tilburg University, Department of Medical and Clinical Psychology, Warandelaan 2, 5037 AB Tilburg, The Netherlands

*Corresponding Author:

Yannic van Gils

Faculty of Medicine and Social Science

University of Antwerp

Universiteitsplein 1

2610 Wilrijk, Belgium

E-mail: yannic.vangils@uantwerpen.be

Gender-specific characteristics of alcohol use in community-dwelling older adults in Belgium

Objectives: Gender has been identified as an important social determinant for health. This study investigates gender-specific characteristics for alcohol use (AU) among community-dwelling older adults.

Methods: This is a retrospective cross-sectional study in 1.406 community-dwelling older adults. We used standardized questionnaires to collect self-reported data on alcohol use behaviour, mental health, drinking motives and resilience by using respectively the Alcohol Use Identification Test (AUDIT), the Brief Symptom Inventory (BSI), the Drinking Motives Questionnaire (DMQ) and the Connor-Davidson Resilience Scale (CD-RISC). Multiple linear regression was used to identify the joint contribution of those factors on AU. Hierarchical regression was used to investigate the influence of the interaction between gender and those factors on AU.

Results: Linear regression analyses showed different associations with AU in men and women. Hierarchical regression analyses showed that gender presented a two-way interaction effect with enhancement and anxiety variables related to AU.

Conclusions: Different characteristics were found as predictors for AU among older men and women.

Clinical implications: Clinicians and health care providers should be aware of these differences in order to provide tailored screening and intervention programs to reduce AU in older adults.

Key words: alcohol use, older adult, risk profiles, AUDIT, drinking motives, mental health, resilience

INTRODUCTION

Gender has been identified as an important social determinant for health and plays an important role in the psychological well-being of older adults (Manandhar et al., 2018; Matud et al., 2020). For example older men demonstrated more psychological well-being than older women, while older women and men whose self-concept includes masculine/instrumental and feminine/expressive traits showed greater psychological wellbeing (Matud et al., 2020).

Alcohol use (AU) among older adults has typically been seen as a male activity. Most studies reported higher prevalence of AU among older men in comparison to older women (Carvalho et al., 2018; Li et al., 2019; Rossow & Træen, 2020; Shenvi et al., 2020). Recently a noticeable increase in AU among older adults has been observed, especially in older women (Bye & Moan, 2020; Grant et al., 2017). Evidence for gender convergence in young adults as well as in adults and older adults was found across a range of drinking patterns and alcohol use problems (Geels et al., 2013; McPherson et al., 2004). This might be a validation of the prospect that women might adopt the drinking patterns of men, which Bloomfield et al. (2001) called the 'convergence hypothesis'. This tendency could create a health trend responsible for a growing public health problem with a high burden on our health care system (Kuerbis, 2020).

A considerable body of research separately identified factors associated with unhealthy AU in older men and women. First, anxiety and depressive symptoms, which has been well documented among older adults (Canuto et al., 2018; Lotfaliany et al., 2019; Welzel et al., 2019), has been associated with higher levels of AU (Haesen et al., 2019; Keyes et al., 2019). Considering gender differences, previous studies reported inconsistent results. For example, Bell & Britton (2014) described poor mental health as an inducing and maintaining factor for high alcohol intake, especially in men. On the other hand, Carvalho et al. (2018) reported that problem drinking might increase the risk for depressive and anxiety symptoms, but only in older women.

Gender differences in motives for drinking have been observed across age groups. Among adults, men report more frequently using social, enhancement and coping drinking motives than women (Gire, 2002), a trend that continues into late adulthood (Gilson et al., 2013; van Gils et al., 2020). In older adults, men are keen to use coping motives while women tend to use alcohol more frequently for social motives (Immonen et al., 2011). The link between mental health and alcohol use may be partially explained by 'self-medication' hypothesis (Turner et al., 2018). Individuals may be prone to use alcohol for coping reasons because it helps them managing negative feelings (Gilson et al., 2017; Stewart et al., 2001; van Gils et al., 2020) or even physical pain (Gilson et al., 2017).

Resilience can potentially buffer the adverse effects of stressful life-events and negative affect.

Recently, resilience has been defined as a process of adapting well in the face of adversity, as bouncing back from difficult experiences (APA, 2020). Previous studies among adults and older adults

described the moderating effect of resilience on the relationship between stress and alcohol-related problems (Hardy et al., 2004; Morgan et al., 2018; van Gils et al., 2021). This link might lead to the idea that resilience might be considered as protective factor. The buffering effect of resilience for heavy alcohol use might be present especially in older men, as Hardy et al. (2004) described higher levels of resilience among older men in comparison to older women.

Problem statement and aim of the study

To date, research on potential risk factors associated with AU among older adults is scarce. Additionally, the consideration of the gender differences on this topic has been overlooked. This is surprising given the importance of identifying and screening to minimize alcohol related harm, especially when studies reported an elevated AU in this population (Foster & Patel, 2019; Grant et al., 2017).

The aim of this study is twofold:

- 1. We examine the joint contributions of mental health factors, drinking motives and resilience (predictors) on AU separately in older men and women. Systematically, studies described alcohol use among older adults as a typical male behaviour and different characteristics of men and women associated with AU (Li et al., 2019; Rossow & Træen, 2020). Considering findings from previous research on the link between mental health and AU in older adults, we hypothesized the following: 1. depressive symptoms, anxiety and hostility will be identified as risk factors for AU for both gender, 2. the endorsement of coping drinking motives being a risk factor for AU, especially in men, 3. social drinking motives being a risk factor for AU, especially in women and 4. resilience being a protective factor for AU, especially among men.
- 2. We explore the influence of the interaction between the predictors and gender on AU. We hypothesized the following: there will be an interaction between coping drinking motives and gender, between depression and gender and anxiety and gender and between resilience and gender.

MATERIALS AND METHOD

This is a retrospective cross-sectional study exploring AU and associated factors in community-dwelling older men and women by using an extensive quantitative survey.

Sample

Adults aged 65 or older and living at home were invited to participate. Older adults reporting memory problems, having a neurodegenerative disease or sensory deficits were excluded. As the questionnaire and informed consent was in Dutch, older adults needed to have a good comprehension of the Dutch language. If they reported difficulties understanding the questions, they were also excluded. The

population was recruited by a snowball sampling. During gatherings in community centers and local activity groups the purpose and procedure of the study were explained. Subjects were able to sign up and those who did were asked to make an appointment. The appointments were made at their own residence. At that time, a trained research assistant explained the purpose and procedure of the study for a second time. Most older adults were able to complete the questionnaire by themselves, yet the research assistant was at all time available for help and assistance. When both spouses were questioned, they were placed in different rooms of the residence to reduce potential influences. After the assessment, participants were asked if they had acquaintances that would volunteer to fill in the questionnaire. The sample population, enrolled from October 2013 to April 2020, consisted of 1.971 older adults living in the Flemish part of Belgium (Flanders). This study is part of a larger research project on the drinking patterns of older adults in Belgium (van Gils et al., 2019). For this article, the drinking population aged 65 and over (n 1.406) has been selected for all analyses.

Measurements

Alcohol use: The Alcohol Use Disorder Identification Test (AUDIT) (Babor et al., 2001) was used to assess the level of AU. It contains 10 questions: 3 regarding the quantity and frequency of alcohol use, 3 regarding alcohol dependence, and 4 regarding problems caused by alcohol misuse. Each item receives a score of 0 to 4. For the statistical analyses, we used the AUDIT total score as a continuous variable as the outcome in the analyses. The total score represents the level of hazardous drinking. Research from (Aalto et al., 2011) suggested that the AUDIT questionnaire is an adequate measure for hazardous drinking in an older population. Cronbach's alpha for the full scale (AUDIT) in our sample was .77. Using the guideline of ≥.70 makes this value acceptable for internal consistency (Bland & Altman, 1997). To retrieve the problematic drinking respondents, a cut-off score of >4 on the total AUDIT score was use (Aalto et al., 2011).

Mental health factors: Participants completed the Brief Symptom Inventory (BSI) as a self-report measurement for mental health (Derogatis & Melisaratos, 1983). The BSI is suitable for (young) adults as well as older adults in identifying psychological symptoms (de Beurs, 2011). The instrument includes 53 items and assesses nine symptom dimensions across three global indexes with a good internal consistency. Each item of the BSI is rated on a 5-point scale of distress (experienced during the past week), ranging from 'not-at-all' to 'extremely'. From the nine symptom dimensions, we use Depression (6 items), Anxiety (6 items) and Hostility (5 items) as predictive variables. In our sample these dimensions had Cronbach's Alpha of respectively .81, .79 and .69 which is acceptable for internal consistency (Bland & Altman, 1997).

Resilience: The Connor-Davidson Resilience scale (CD-RISC) (Connor & Davidson, 2003) is a measure of stress-coping ability including 25 items each rated on a five-point scale (0 = not true at all, 1 = rarely true, 2 = sometimes true, 3 = often true, 4 = true nearly all of the time). Higher ratings

indicates greater resilience. The total score range is from 0-100 and will be used in the analyses. The CD-RISC has demonstrated strong internal consistency and test–retest reliability (α = .89) in a general population (Connor & Davidson, 2003). We previously conducted factorial analysis on the CD-RISC and extracted three factors with acceptable internal consistency: self-efficacy (α = .89), adaptability (α = .83) and spirituality (α = .71) (van Gils et al., 2021), which will be used as predictors in our linear models.

Drinking motives: The Drinking Motives Questionnaire (DMQ) was used to measure the motivations to use alcoholic beverages, which was validated in older adults by (Gilson et al., 2013). The 15-item scale consists of three subscales: 1. social, 2. enhancement and 3. coping drinking motives. Responses options ranged from 1 (almost never/never) to 5 (almost always). Higher scores on each subscale indicate greater endorsement of that particular drinking motive. The three motive subscales proved to have a good reliability in our old population (alphas were .83 for social, .69 for enhancement and .77 for coping) and were used as predictors.

Statistical analyses

First, we conducted sets of bivariate analyses. To identify the differences between men and women concerning demographic variables such as educational level (lower secondary school, secondary school and higher education), living situation (living with spouse or living alone), having experienced a loss in the past 12 months and smoking (yes-no) and having an AUDIT score >4, which were all categorical variables, we used Pearson's Chi-square test. To examine the differences between men and women on AU (AUDIT total score), mental health factors (depression, anxiety, hostility), resilience factors (self-efficacy, adaptability, spirituality) and drinking motives (social, coping and enhancement drinking motives), which were continuous variables, we used the independent sample t-test. Additionally, we conducted bivariate correlations between variables AU (AUDIT total score), mental health factors (depression, anxiety, hostility), resilience factors (self-efficacy, adaptability, spirituality) and drinking motives (social, coping and enhancement drinking motives) for men as well as for women.

Aim 1: to examine the joint contributions of mental health factors, drinking motives and resilience on AU separately in older men and women.

Secondly, a set of multiple linear regression analyses were used to identify factors associated with AU, one respectively for drinking and problematic drinking men and one respectively for drinking and problematic drinking women. The AUDIT total score was used as a dependent variable in all models and resilience, mental health factors and drinking motives were used as predictors. Categorical variables cannot be entered as such in a regression equation. Therefore a dummy coding system was used for all categorical variables. Adjusted odd ratios (OR) with 95% confidence interval (CI) are presented.

Aim 2: to examine the influence of the interaction between predictor and gender on AU

Thirdly, we performed a series of hierarchical regression analyses with the AUDIT score as dependent variable and smoking (step 1), gender (step 2), the main effect of depression, anxiety and hostility (step 3), the main effect of social, enhancement en coping drinking motives (step 4), the main effect of self-efficacy, adaptability and spirituality (step 5), the two-way interactions with depression, anxiety and hostility (GEN x DEP, GEN x ANX, GEN x HOST) (step 6), the two-way interactions with social, enhancement en coping drinking motives (GEN x SOC, GEN x ENH, GEN x COP) (step 7) and the two-way interactions with self-efficacy, adaptability and spirituality (GEN x SELF, GEN x ADAP, GEN x SPIR) (step 8). To compute interaction terms, the independent variables were first standardized.

The statistical analyses were conducted using SPSS Statistics 26 (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.).

RESULTS

Sample

There is a total sample of 1.406 drinkers, 684 (48.6%) were men and 722 (51.4%) were women. Further characteristics of the study sample are represented in Table 1 and Table 2. The effect size of the differences between men and women is small for drinking motives, mental health factors as well as for resilience factors.

Bivariate correlation analyses were conducted in men as well as in women, in the drinking sample (Table 3) as well as in the problematic drinking sample (Table 4). In drinking men hostility (r(1.404)=.315, p<.001), coping drinking (r(1.404)=.476, p<.001), social drinking (r(1.404)=.356, p<.001) are positively associated with AU, with medium effect. Enhancement drinking (r(1.404)=.576, p<.001) is positively associated with AU, with a large effect. In problematic drinking men, depression (r(1.404)=.316, p<.001), anxiety (r(1.404)=.355, p<.001), hostility (r(1.404)=.314, p<.001), coping drinking (r(1.404)=.393, p<.001). Enhancement drinking (r(1.404)=.528, p<.001) is positively associated with AU, with a large effect.

Among drinking women, coping drinking (r(1.404)=.479, p<.001), social drinking (r(1.404)=.360, p<.001), enhancement drinking (r(1.404)=.471, p<001), are positively associated with AU, with medium effect. Among problematic drinking women, depression (r(1.404)=.434, p<.001), hostility (r(1.404)=.341, p<.001), coping drinking (r(1.404)=.483, p<.001) en enhancement drinking (r(1.404)=.373, p<.001) is positively associated with AU, with medium effect.

Multiple Linear Regression Analysis in drinking sample

Multiple linear regression models were used to examine the relationship between mental health factors, drinking motives and resilience factors (predictors) and AU (outcome) in older men and women (Table 5). In men as well in women, all variables significantly predict AU (women: F(12)=22.456, p<.001, $R^2=.297$; men: F(12)=37.162, p<.001, $R^2=.415$).

In men, lower age (b=-.065, 95% C.I.=-.103- -.027, p=<.001), smoking (b=1.945, 95% C.I.=1.218-2.672, p=<.001) and higher levels of anxiety (b=.720, 95% C.I.=.036- 1.404, p=.039) were associated with higher levels of AU. In both men and women, increasing endorsement of enhancement was associated with higher levels of AU (women: b=.543, 95% C.I.=.299-.786, p=<.001; men: b=1.268, 95% C.I.=.981-1.555, p=<.001). Furthermore, among women, the following factors were also positively significantly associated with AU: smoking (b=.849, 95% C.I.=.302- 1.396, p=.002), drinking for coping (b=.846, 95% C.I.=.491-1.201, p=<.001) and self-efficacy (b=.342, 95% C.I.=.040-.644, p=.026).

Multiple Linear Regression Analysis in problematic drinking sample

Multiple linear regression models were used to examine the relationship between drinking motives, resilience and mental health factors (predictors) and AU (outcome) in problematic drinking older men and women (Table 5). In men as well as in women, all variables significantly predict AU (women: F(12)=26,719, p<.001, $R^2=.363$; men: F(12)=14,095, p<.001, $R^2=.428$).

Among problematic drinking women the following variables are positively significantly associated with AU: coping drinking motives (b=1.420, 95% C.I.=.396- 2.443, p=.007), depression (b=1.527, 95% C.I.=.096- 2.958, p=.037). Among problematic drinking men the following variables are positively significantly associated with AU: enhancement drinking motives (b=1.352, 95% C.I.=.891-1.813, p=<.001) and anxiety (b=1.144, 95% C.I.=.055- 2.232, p=.040).

Hierarchical regression analyses in drinking sample

The results of the hierarchical regression analyses for the drinking population with the AUDIT total score as dependent variable are displayed in Table 6.

The results showed that in the total drinking population smoking (b=.548, CI [95%]=.395-.701, p<.001), gender (b=.320, CI [95%]=.230-.410, p<.001), depression (b=.068, CI [95%]=.003-.134, p=.041), social drinking motives (b=.064, CI [95%]=.004-.124, p=.035), enhancement drinking motives (b=.336, CI [95%]=.274-.398, p<.001), coping drinking motives (b=.114, CI [95%]=.050-.178, p<.001) and self-efficacy (b=.070, CI [95%]=.005-.135, p=.035) were associated with AU. Analyses showed that gender presented a two-way interaction effect with enhancement drinking

motives (b=.247, CI [95%]=.120-.374, p<.001) and anxiety (b=.173, CI [95%]=.048-.297, p=.007) related to AU.

Hierarchical regression analyses in problematic drinking sample

The results of the hierarchical regression analyses for the problematic drinking population with the AUDIT total score as dependent variable are displayed in Table 6.

In the total problematic drinking population, smoking (b=.562, CI [95%]=.245–.879, p<.001), gender (b=.402, CI [95%]=.142–.663, p=.003) and enhancement drinking motives (b=.358, CI [95%]=.235–.481, p<.001) were associated with AU. Analyses showed that gender presented a two-way interaction effect with enhancement drinking motives (b=.451, CI [95%]=.156–.746, p=.003) and anxiety (b=.434, CI [95%]=.089–.780, p=.014) related to AU.

DISCUSSION

This study aimed to determine risk factors associated with AU in community-dwelling drinking and problematic drinking older adults by calculating models for men and women and by investigating the effect of the interaction between predictors and gender on AU. We hypothesised that for men mental health factors, coping drinking motives and resilience would be important factors associated with AU. For women we hypothesised that mental health factors and social drinking motives would be associated with AU. Our findings are twofold. First we found significant predictors in our male sample as well as in our female sample. Secondly, we found a moderating effect of gender and anxiety and gender and enhancement drinking motives on AU in the drinking population as well as in the problematic drinking population,

To examine the joint contributions of mental health factors, drinking motives and resilience on AU separately in older men and women a set of multiple linear regression analyses were conducted. First we found age being inversely associated with AU in male drinkers and problematic drinkers. This is in line with previous research stating that younger age is associated with higher levels of AU among older adults (Foster & Patel, 2019; Muñoz et al., 2018). Secondly, drinking for enhancement reasons could be considered as a predictor for AU in drinking older men and women and in male problematic drinkers. This is in in line with Gilson et al. (2013) who reported almost ten years ago that drinking to enhance positive mood was an indicator for AU in older adults. Our results are also in line with recent literature on adolescence. According to a Belgian longitudinal study among students, drinking for enhancement motives are predictive for AU, at cross-sectional and longitudinal levels (Lannoy et al., 2019). Drinking to enhance positive feelings can be considered as a positive internal reinforcer. Older adults nowadays may be more likely to use alcohol for fun and pleasure, just like their younger peers (Lannoy et al., 2019). This new trend however, might be alarming because of the increased

vulnerability of older adults for the adverse consequences of alcohol due to their aging process. More research focusing on drinking for fun and pleasure among older adults is necessary in order to present tailored prevention and intervention programs to reduces heavy drinking.

In the drinking sample as well as in the problematic drinking sample, anxiety is an associated factor for men. Men reporting higher levels of anxiety have a higher likelihood to report AU. This is in line with the tension-reduction theory stating that using alcohol might reduce the tension experienced in any anxious situation (Kushner et al., 1990). In our female problematic drinking sample, depressive symptoms has been positively associated with AU. The latter is in line with previous research, which is particularly concerning in older adults whom are already at higher risk for depressive feelings (Keyes et al., 2019). Our study could not demonstrate causality nor directionality of the relation between mental health and AU, which could be the goal of further qualitative or longitudinal research.

Drinking for coping reasons is also risk factors for AU in drinking and problematic drinking women. Women endorsing coping motives tend to report higher levels of AU. Drinking to cope with negative feeling or physical pain has been identified as a risk factor for problem drinking among older adults (Gilson et al., 2017). Using alcohol as a coping response to stress will decrease the probability to exercise volitional control over alcohol use. Because of this dependence, individuals are at higher risk for alcohol related problems (Cooper et al., 1995). Because of the high prevalence of anxiety and depression in older adults (Lotfaliany et al., 2019; Welzel et al., 2019) and the high prevalence of selfmedication (Turner et al., 2018), healthcare providers should always ask the question "Why do you drink?". Unexpectedly, in the multivariate analyses in our male sample, no association between drinking to cope and AU was found. A possible explanation might be the presence of low levels of depression and anxiety in our male sample leading to the absence of coping-motivated drinking. Indeed, men in our sample scored lower than the predefined norms on both the depression and anxiety scales of the BSI (de Beurs, 2011). Further research could focus on the coping-motivated drinking behaviour in older adults with higher levels of depression or/and anxiety. Also, more research on the complex association between anxiety, coping drinking motives and alcohol use among older men is necessary. The level of anxiety might influence the association between coping drinking motives and AU in men. With lower levels of anxiety the association might loses its significance. Because of the lower levels of anxiety in our male population, the coping drinking motives could have lost its significance in the multivariate model. This could be the focus for further research on AU among men.

Surprisingly, self-efficacy, as resilience factor, has been identified in this study as a risk factor for AU among older drinking women. Literature described resilience as a buffer against heavy alcohol use (Morgan et al., 2018). In our sample however, women who feel confident (less anxious) and with high efficacy expectancy tend to report higher levels of alcohol use. More research in these dynamics should be conducted to understand older women's AU. Research could focus on moderate and heavy

AU among older women and investigate why these dynamics are different between those two drinking patterns.

In addition, we conducted sets of hierarchical regression analyses to investigate the influence of the interaction between the predictors and gender on AU, in the drinking sample as well as in the problematic drinking sample. Our findings highlights the interaction effect of gender and drinking for enhancement motives and gender and anxiety on AU among drinking as well as problematic drinking community-dwelling older adults. More precisely, among drinking men and problematic drinking men, the association between drinking for enhancement and AU and the association between anxiety and AU is stronger in men, in comparison to their female peers. It is notable that the interaction effects seem to be robust to different samples. Cooper et al. (1995) described drinking motives as commonly cited reasons to use alcohol by a general as well as a clinical population. In addition, drinking motives are often the reason why individuals relapse into alcohol misuse. More research could focus on the underlying dynamics of these findings. Understanding the drivers for alcohol use can help healthcare givers and prevention and intervention programs to be more specific and maybe more efficient.

Strengths & Limitations

The main strengths of this study is the community sample, the wide sample and the data gathering by validated quantitative questionnaires. Additionally, for the first time to our knowledge, a gender-specific risk profile for AU in community-dwelling older adults has been presented.

There are some limitations in this study. Although the privacy of the sealed-envelop method was used, the might have led to social desirable answers. It might be possible to assume that problematic alcohol use are likely to be underreported. Another concern is the cross-sectional design of the study. This does not allow us to draw conclusions on the direction of the associations. Neither information on past changes in drinking habits nor a timeline of alcohol use and life events were available. More research on the causality between mental health factors, drinking motives and resilience is needed. A prospective cohort study seems most appropriate to further study alcohol and its associated factors in these populations. A third concern might be the large heterogeneity of the waves used to conduct the study. It could be that the change in some characteristics of de respondents might have influenced our results. A larger, more recent cohort study could explore this assumption.

Clinical Implications

Screening alcohol use in older adults should be implemented in clinical practice (Han et al., 2019). While asking individuals about their alcohol use behaviour, it might be helpful to go beyond the standardized questions about quantities and frequencies. Among older men, drinking for enhancement reasons, depression and/or anxiety might be crucial factors in their drinking process. Among older women drinking for enhancement or coping reasons, anxiety, depression and/or self-efficacy might be

of some concern. Being aware of those factors might help clinicians to identify older adults at higher risk for problematic drinking. In other to reduce or prevent alcohol misuse in older adults it might be helpful to understand these underlying factors in order to provide tailored advices and interventions.

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Author contributions

-Substantial contributions to the conception or design of the work; or the acquisition, analysis, or

interpretation of data for the work: Yannic van Gils, Geert Dom, Erik Franck, Eva Dierckx

-Drafting the work or revising it critically for important intellectual content: Yannic van Gils, Erik

Franck, Geert Dom, Eva Dierckx

-Final approval of the version to be published: Yannic van Gils, Geert Dom, Eva Dierckx, Erik Franck

and Sebastiaan van Alphen

-Agreement to be accountable for all aspects of the work in ensuring that questions related to the

accuracy or integrity of any part of the work are appropriately investigated and resolved: Yannic van

Gils, Eva Dierckx, Erik Franck and Sebastiaan van Alphen

Conflict of interest

The authors report no conflicts of interest.

Statement of Ethics

The research protocol has been approved by the Ethical Committee of University Hospital in Antwerp

(14/44/458). Anonymity and confidentiality were emphasised by the interviewer. A written informed

consent was obtained before starting the survey. No names were registered and all the obtained data

were processed by the research team.

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Data Availability Statement

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Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

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