

1 **Exploring influencing factors for physical activity**  
2 **participation and promotion in people with advanced**  
3 **head and neck cancer**

4 Protocol of a qualitative study

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25 **Abstract**

26 **Background:** Higher physical activity levels are associated with better quality of life in people  
27 affected by head and neck cancer. Nevertheless, most individuals with these cancer types  
28 show a sedentary behaviour or very low activity levels. Insights on factors influencing physical  
29 activity from the perspective of individuals affected by an advanced head and neck cancer  
30 diagnosis is still sparse and the views of their significant others have not been explored yet.  
31 To design suitable interventions to support this group to be or become more active in the future,  
32 there needs to be more in-depth knowledge about the factors that influence their activity  
33 behaviour.

34

35 The aim of this study is to explore factors influencing capabilities, opportunities, and motivation  
36 for physical activity participation and promotion in people with an advanced head and neck  
37 squamous cell carcinoma from the perspective of people being affected and their significant  
38 others.

39

40 **Methods:** Semi-structured interviews will be held with people with advanced head and neck  
41 cancer and focus group interviews will be conducted with significant others of people being  
42 affected. Interviews will be transcribed verbatim and analysed by a content analysis with a  
43 deductive-inductive approach based on the domains of the behaviour change wheel.

44

45 **Expected outcomes:** This study will give insights on physical activity participation and  
46 promotion from the perspective of people affected by an advanced head and neck squamous  
47 cell carcinoma and their significant others. The results will build the foundation for subsequent  
48 research projects to design and test physical activity promotion programmes tailored to this  
49 group.

50

51 **Keywords:** qualitative research, physical activity, influencing factors, head and neck cancer, behaviour change  
52 wheel

53 **Abbreviations:** HNSCC: head and neck squamous cell carcinoma; PA: physical activity

54

55

56 **Background and Rationale**

57 Head and neck cancer ranks as the seventh most common cancer type worldwide of which  
58 about 90% are squamous cell carcinomas<sup>1</sup>. These cancer types are usually diagnosed in stage  
59 three or four and need extensive medical treatment<sup>2</sup>, that can leave the person with a variety

60 of different impairments and treatment sequelae including swallowing problems, fatigue and a  
61 reduced quality of life<sup>3,4</sup>

62

63 Physical activity (PA) and exercise have positive effects on the health status and quality of life  
64 in patients with head and neck cancer<sup>5</sup>. Higher activity levels are associated with better quality  
65 of life<sup>6</sup>, physical functioning, body composition and fatigue<sup>7,8</sup>, but the majority of people with  
66 these cancers show a sedentary lifestyle or very low activity levels<sup>9</sup>. A scoping review was  
67 conducted by the study team to compile the existing knowledge on factors influencing PA in  
68 individuals with head and neck cancer and the suggestions by health care experts and  
69 researchers in the field<sup>10</sup>. This review concluded that personal, social, environmental, and  
70 health-related factors significantly influence PA participation for patients with head and neck  
71 cancer. These factors encompass personal characteristics like age and co-morbidities, as well  
72 as factors such as attitude, interest, and motivation. Treatment side-effects and the overall  
73 health condition of individuals are also important factors. Experts suggest that further research  
74 is necessary to develop interventions that encourage patients' participation and support them  
75 to overcome potential PA barriers. They also recommend that the implementation of PA  
76 interventions into the clinical pathways should be explored in more detail.

77

78 Insights from the perspective of individuals with a head and neck cancer diagnosis on the  
79 context of PA participation is still very sparse<sup>9</sup>. More in-depth knowledge should be gained to  
80 enable the design of suitable interventions to support this group to change their behaviour  
81 successfully and sustainably towards a more active lifestyle. The perspectives of people being  
82 affected is crucial to tailor interventions to their needs.

83

84 Additionally, the experiences and opinions of significant others of people with head and neck  
85 cancer have not yet been explored. A 'significant other' is a person who is important to one's  
86 well-being<sup>11</sup>, who is usually a partner or spouse or another close person, such as a family  
87 member or a friend. These significant others are a valuable source of information to understand  
88 the complex situation of PA participation in this group and will help to gain an important insight  
89 on how to design an adequate intervention to help individuals with head and neck cancer to  
90 change to a more active lifestyle<sup>12</sup>.

91

92 To understand and enhance behaviour change, the behaviour change wheel by Michie et al.<sup>13</sup>  
93 is a useful framework, which provides a systematic way to understand behaviour change and  
94 to design interventions. The hub of the wheel consists of the aspects of capability, opportunity,  
95 and motivation (COM-B model) of behaviour. The second layer states nine intervention  
96 functions that can be used to bring about behaviour change including education, persuasion,

97 incentivization, coercion, training, restriction, environmental restructuring, modelling, and  
98 enablement. The most outer layer of the wheel includes seven policy categories that can be  
99 used to implement interventions (see appendix A).

100  
101 The aim of the study is to explore capabilities, opportunities, and motivation for PA participation  
102 in people with a diagnosis of an advanced head and neck squamous cell carcinoma (HNSCC).  
103 This will be examined from the perspective of people being affected by HNSCC and the  
104 perspective of their significant others.

105  
106 **Research questions:**

107 - What capabilities and opportunities for PA participation do people with advanced  
108 HNSCC experience?  
109 - What motivates people with advanced HNSCC to be physically active?  
110 - How do significant others view capabilities, opportunities, and motivation for PA  
111 participation in people with advanced HNSCC?  
112 - What suggestions and recommendations for PA promotion do people with advanced  
113 HNSCC and their significant others have?  
114 -

115

116 **Methods**

117 **Study registration:**

118 The study project will be registered at the clinical trials registry of the U.S. National Library of  
119 Medicine<sup>14</sup>.

120

121 **Ethical approval:**

122 A clarification of responsibility was submitted to the Zurich Cantonal Ethics Committee  
123 (BASEC Nr. Req-2023-00397). They concluded that the study project does not fall within the  
124 scope of the Human Research Act.

125

126 **Patient and public involvement:**

127 The guide of the patient lab of the Swiss Cancer Centre Leman<sup>15</sup> will be applied. A patient  
128 advisor and an individual with a HNSCC will be consulted to give feedback on specific steps  
129 of the project. This will include feedback on the development of the interview guide, during the  
130 coding process, and the analysis phase.

131

132 **Methodological orientation and theory of the study:**

133 The study will apply a descriptive qualitative approach to describe the phenomenon  
134 comprehensively with a focus on relevance for clinical practise<sup>16</sup>. This approach is used in the  
135 context of intervention development and results are presented in everyday language, rather  
136 than in a conceptual, philosophical or highly abstract framework<sup>17,18</sup>.

137

138 **Study Design:**

139 Semi-structured individual interviews with people affected by HNC will take place in a face-to-  
140 face setting or virtually according to the participants preference. The individual setting is  
141 chosen to ensure that the interviewer can respond well to the needs of the interview participant.  
142 People with advanced HNSCC might need frequent breaks during the interview to be able to  
143 drink something to relieve the common side effect of having a dry mouth. Additionally, they  
144 might also have problems speaking which could lead to problems or intimidation if a group  
145 setting was chosen. Focus group interviews will be conducted with significant others of people  
146 with HNSCC. This will enable interaction between the participants and encourage discussion  
147 about the topic<sup>19</sup>. Interview guides for the individual interviews and the focus group interviews  
148 will be developed based on existing literature on influencing factors for PA participation in  
149 patients with head and neck cancer and the expertise of the study team. The behaviour change  
150 wheel<sup>13</sup> will be used as a theoretical framework (see Appendix A).

151

152 **Participants and sampling:**

153 To achieve data saturation<sup>20</sup> the study population will be limited to individuals affected by a  
154 stage III or IV squamous cell carcinoma, as this subgroup constitutes the largest proportion of  
155 patients diagnosed with head and neck cancer<sup>2</sup>.

156

157 *Inclusion criteria for people with HNSCC:*

- 158 - minimal age 18
- 159 - diagnosis of a primary head and neck squamous cell carcinoma within the last 24 months
- 160 - oral, pharyngeal, or laryngeal cancer stage III or IV
- 161 - completed surgery and/or radio(chemo)therapy in curative intent

162

163 *Exclusion criteria for people with HNSCC:*

- 164 - not having the physical, mental, and cognitive ability to understand, follow and hold a  
165 conversation in (Swiss-)German
- 166 - treatment in palliative intent
- 167 - recurrence of the head and neck tumour (local or distant)

168

169 *Inclusion criteria for significant others of people with HNSCC:*

- 170 - minimal age 18
- 171 - being a significant other (partner, spouse, close family member or friend) of an individual with  
172 a HNSCC with the above-mentioned criteria
- 173 - having the permission of the individual affected by HNSCC to talk about their experiences

174

175 *Exclusion criteria for significant others of people with HNSCC:*

- 176 - not having the physical, mental, and cognitive ability to understand, follow and take part in a  
177 group discussion in (Swiss-)German

178

179 **Recruitment:**

180 People affected by HNSCC, and significant others of people being affected will be recruited by  
181 direct contact with health professionals involved in their treatment and care in different regions  
182 of Switzerland. For the recruitment of significant others, the permission of the person affected  
183 by HNSCC needs to be obtained; this will be confirmed in the informed consent form.

184

185 The recruiting sites are:

- 186 - Cantonal Hospital Winterthur (KSW)
- 187 - Cantonal Hospital Lucerne
- 188 - 'ear, nose, throat and plastic surgery center' at Hirslanden Clinic, Zurich

189 - rehabilitation clinics 'Berner Klinik Montana' and 'Adelheid'  
190 - if necessary, the recruitment sites could be extended to include the cantonal cancer leagues  
191 and other health institutions within the German speaking part of Switzerland

192

193 *Update to recruitment sites (December 2024):*

194 - all cantonal and regional cancer leagues were included in the recruitment process  
195 - additional hospitals and rehabilitation clinics/centers were included to support recruitment:  
196     - University Hospital Bern (Inselspital)  
197     - University Hospital Zurich  
198     - University Hospital Basel  
199     - Cantonal Hospital St. Gallen  
200     - Outpatient rehabilitation Chur  
201     - Rehabilitation clinic Zihlschlacht

202

203 Potential interview participants will be provided with an informational brochure accompanied  
204 by a pre-stamped envelope facilitating the return of their contact details via a designated card  
205 for completion. The study coordinator (MS) will then contact the person and give further  
206 information and check if the person is eligible to participate. A minimum of 12 individuals with  
207 a HNSCC diagnosis and eight significant others will be recruited for the interviews and focus  
208 groups respectively with the goal to reach data saturation<sup>20,22</sup>.

209

210 **Data collection:**

211 All participants will receive a short questionnaire prior to the interview to collect their personal  
212 characteristics (e.g., age, education level, personal estimation of PA levels, their or their  
213 significant others' type of HNSCC diagnosis and treatment). The individual semi-structured  
214 interviews will be conducted at a place to the persons preference, either in their home, at the  
215 hospital/rehabilitation clinic, or if not possible otherwise virtually via an online video call. Focus  
216 group interviews will take place either at one of the involved clinics or at a cantonal cancer  
217 league. Prior to the start of the interview, informed consent will be signed, and remaining  
218 questions about the interview conduct will be answered. The individual interviews will last 30  
219 to 60 minutes. Two to three focus groups with the significant others will be held and will last  
220 60 to 90 minutes. To reach data saturation, a redundancy of themes should be achieved<sup>23</sup>.  
221 Interviews and focus group interviews will be audio-recorded with approval of participants as  
222 stated in the informed consent form<sup>24,25</sup>. Notes will be taken by the interviewer to help  
223 remember special occurrences during the interviews. A test interview will be held to test the  
224 interview guide and make necessary adjustment.

225

226 **Data analysis:**

227 Interviews will be transcribed verbatim<sup>24</sup> by first using the automated transcription tool  
228 'noScribe' <sup>26</sup>. This is followed by manually checking and correcting of the transcripts. The parts  
229 which could reveal the participants identity will be anonymized at this point. The transcripts will  
230 be checked and validation by the person who has conducted the interview. For coding and  
231 analysing the data, the software MAXQDA<sup>27</sup> will be used. A structuring qualitative content  
232 analysis will be used as described by Kuckartz<sup>28</sup> with a deductive-inductive approach. This  
233 method entails seven phases as shown in Table 1. It starts with the initial work with the text by  
234 reading the transcripts, writing memos, and summarizing cases. This will be done individually  
235 by the two researchers who will code the interview. The main categories are defined based on  
236 items of the behaviour change wheel and results of our scoping review on influencing factors  
237 for PA in head and neck cancer<sup>10</sup>. The first four interviews will be used to test the applicability  
238 of the main- and subcategory system, if necessary, adaptions will be made. The first coding  
239 cycle includes coding with the main categories by MS and by a second coder RE, MB or a  
240 research assistant in a consensual coding process<sup>28</sup>. Diverging codes will be discussed  
241 between the two coders until consensus is reached, if necessary, a third person will be involved  
242 in the decision. This step is followed by inductively developing sub-categories and then coding  
243 the data with the sub-category system. When this second coding cycle is finished, simple and  
244 complex analyses follow. This will include a category-based analysis of the main and  
245 subcategories but will also explore relationships between categories and state frequencies of  
246 categories and subcategories. In regular intervals results of the coding and analysis will be  
247 discussed with senior researchers in the field of HNC and qualitative research (ME & CS) and  
248 a patient advisor. In the last phase of the research process the results to the research  
249 questions will be written and complemented with quotes from the transcript. The process of  
250 the analysis will be documented by describing the steps of the analysis and how categories  
251 were constructed and how they are based on the data.

252

253

**Table 1.**  
**The seven phases of structuring qualitative content analysis  
according to Kuckartz<sup>28</sup>**

- 1) Reading transcripts, writing memos, summarizing cases
- 2) Developing main categories
- 3) Coding with main categories (first coding cycle)
- 4) Developing sub-categories inductively
- 5) Coding with sub-categories (2nd coding cycle)
- 6) Simple and complex analyses
- 7) Writing results and documenting process

254

255 **Data protection and management:**

256 Information about interview participants, informed consent forms and audio recordings of the  
257 interviews will be stored in a protected folder on a computer of the Cantonal Hospital Winterthur  
258 which can only be accessed by the study coordinator (MS) and an assistant who will aid in  
259 transcribing the interview. The automated transcription tool 'noScribe' allows to use audio-files  
260 which are stored locally on a protected device.

261

262 **Reporting:**

263 The consolidated criteria for reporting qualitative studies (COREQ)<sup>29</sup> will be used to guide the  
264 reporting process. Quotes that represent the theme and subthemes will be extracted from the  
265 interview transcripts.

266

## 267 **Expected results**

268 The results of this qualitative study will provide in-depth knowledge on PA participation from  
269 the perspective of individuals affected by an advanced HNSCC. Additionally, views of  
270 significant others of people affected by HNSCC are included which will provide valuable  
271 information from a different point of view. The more sedentary individuals with HNSCC might  
272 be difficult to recruit because they might not want to talk about this topic, likewise individuals  
273 with speech impairments due to a laryngeal cancer might not be able to participate in the  
274 interviews but their significant others can share their experiences. The combined results from  
275 individuals directly affected and significant others will have the potential to give a more  
276 comprehensive overview on the topic. This will build a foundation for the future development  
277 of tailored PA promotion programmes for this patient group (see Appendix B).

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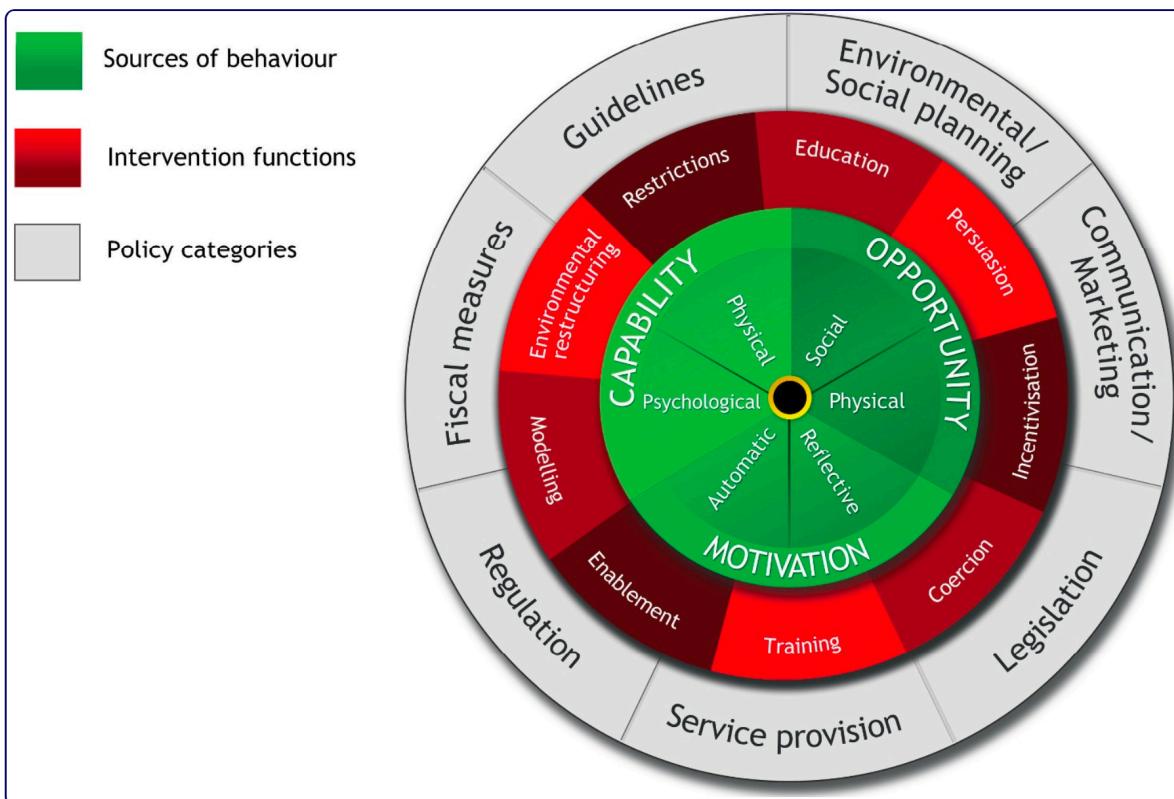
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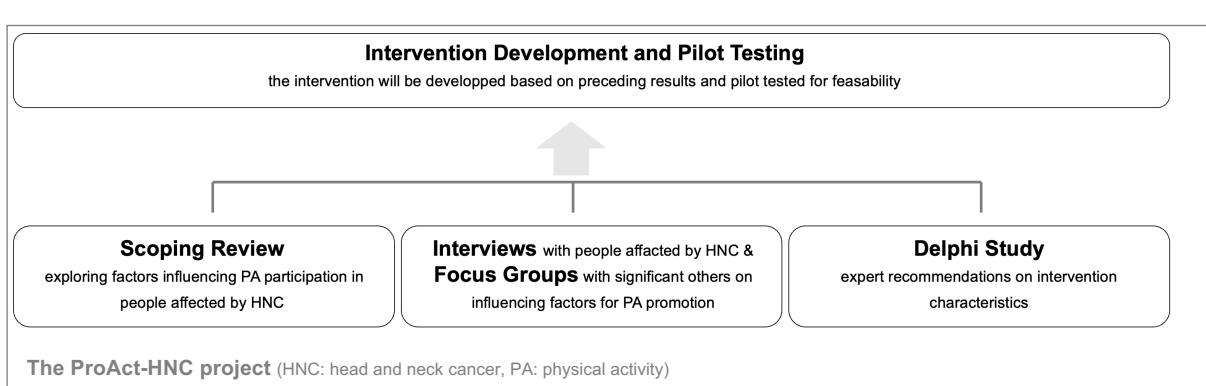
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341 **Appendix A:**  
 342 **The Behaviour Change Wheel by Michie et al.<sup>13</sup>**  
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344  
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 346  
 347 **Appendix B:**  
 348 **Overview of the overall research project**  
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