

# Profile of Oncological Patients Needing Rehabilitation by Dental and Bucomaxillofacial Prostheses in a Brazilian Subpopulation

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## Research Article

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# Abstract

**Purpose:** This study aimed to identify the profile of cancer patients in need of rehabilitation with oral and/or buccomaxillofacial prostheses, as well as to evaluate the possible reasons for not concluding the rehabilitation.

**Materials & Methods:** This is a retrospective observational study carried out at the Dentistry Department of the Mato Grosso Cancer Hospital, Cuiabá, MT, Brazil, through the evaluation of the medical records of patients attended from April 2017 to November 2019.

**Results:** The study population comprised 256 patients who met the research inclusion criteria. It was found that 30.90% of the patients were elderly, 65.6% were men, 70.3% brown, 27.3% retired, 49.2% married and 52% coming from municipalities of the interior of the state of Mato Grosso. From the total of patients, 67.23% reported smoking and 53.9% alcohol consumption. As for the location of the tumor, 57.4% had it in the head and neck region, 55.1% of which were epidermoid carcinoma and in 28.9% of cases the disease stage was IV. Most of the patients (60.2%) completed prosthetic rehabilitation, with total prostheses predominating. The main reasons for not completing the rehabilitation were the patient's death and weakness.

**Conclusions:** Patients who started treatment in more advanced stages of cancer had a greater chance of not completing the prosthetic rehabilitation, and the incompleteness of rehabilitation treatment was directly related to the patients' death and the state of weakness.

## Introduction

Cancers in the head and neck region profoundly affect the quality of life of patients, as they can affect the patient's aesthetics and are a constant reminder of the disease. These cancers are emotionally debilitating for patients and their families<sup>1</sup>.

The diagnosis of cancer negatively impacts the patient's life and feelings of fear and suffering are common throughout the process, which begins with the diagnostic phase, followed by therapy and survival<sup>2,3</sup>. Most post-treatment patients, whether surgical or not, remain in subsequent follow-up visits for an average period of 10 years<sup>4</sup>.

Cancer treatment causes from mild to more severe adverse effects<sup>5</sup>. Large facial defects compromise vital functions such as breathing, chewing, speaking, swallowing and aesthetics. A prosthetic reconstruction of facial defects helps to restore functional disabilities and assists in the recovery of the patient and his family<sup>6</sup>.

In the treatment of tumors in the head and neck region, patients are also often submitted to surgeries that have a serious impact on quality of life and can impair appearance and functional characteristics<sup>7</sup>. Mutilations on the face can bring very important aesthetic and functional damage to patients, causing morphofunctional and psychosocial changes leading the individual to social and family isolation. Thus, it is imperative that health professionals commit to their rehabilitation<sup>8</sup>.

Prosthetic treatment is indicated to regain lost oral functions, improve physical appearance and enable patients to participate in daily activities with greater confidence<sup>9</sup>. The absence of teeth, not replaced by prosthesis also negatively affects the quality of life of cancer patients<sup>10</sup>.

Given the important demand for dental care of patients with malignant neoplasms and the positive impact of rehabilitation on their quality of life, this study aims to outline the profile of cancer patients rehabilitated with dental and/or maxillofacial prostheses, and also the reasons for inconclusion of rehabilitation treatments.

## Materials & Methods

### Population selection

Data collection was performed by surveying the medical records of patients treated at the Dentistry Department of the Cancer Hospital of Mato Grosso, Cuiabá, MT, Brazil, from April 2017 to November 2019. This period was selected because the hospital uses a single medical record for each patient and the medical records are managed by an information system that was replaced in April 2017.

All prosthetic care performed in the period were surveyed in the Care Management System, reaching the total of patients who had an indication for prosthetic rehabilitation treatment in the period. Patients of both sexes and of any age were included. Patients who were rehabilitated but had no confirmed diagnosis of cancer and patients whose information was not possible to be collected in the respective medical records were excluded.

### Collected data

Information about age; sex; race/color of skin (defined through the recommendation by the Brazilian Institute of Geography and Statistics - IBGE)<sup>11</sup>; origin (separated into two distinct groups: state capital and cities from the interior of the state); profession; marital status; smoking and drinking habits; and family history of cancer were collected.

As for the characteristics of the disease, the tumor location, histological type, stage of the disease, and the cancer treatments performed (surgery, radiotherapy and chemotherapy) were collected. Regarding the characteristics of prosthetic rehabilitation, data were collected regarding the types of maxillary prostheses (total, partial, total obturator, and partial obturator), mandibular (total or partial), and facial; and the reasons for not completing rehabilitation.

Patients who met the inclusion criteria, but whose medical records did not present the information on completing the rehabilitation or installation of the prosthesis, were actively sought by telephone and questioned as to the reason for the fail in the conclusion of the rehabilitation treatment. Those patients or their relatives contacted, gave different answers to the fail in the conclusion of the treatment. These responses were grouped into five distinct groups, as follows: patient died before completing the rehabilitation treatment; patient interrupted the treatment because of weakness; patient is still in rehabilitation treatment; patient completed the rehabilitation in somewhere else and patients with no defined response (corresponding to the cases in which telephone contact was unsuccessful).

## Data analysis

A single researcher collected the data and organized in an Excel spreadsheet. Descriptive statistical analysis was performed for the studied variables. The result was presented as absolute and relative frequencies. To analyze possible associations between independent variables and the dependent variable not completing the prosthesis and between the independent variables and the dependent variables reason for not completing the prosthesis, multinomial logistic regression was applied, following previously used methodology<sup>12</sup>. Statistical tests were performed using the SPSS version 22.0 program and results of  $p < 0.05$  were considered significant.

This study was approved by the Human Research Ethics Committee of the University of Cuiabá (UNIC), protocol #3.740.742.

## Results

In the present study, 470 hospital records were analyzed, among which 256 records fit the research inclusion criteria. The other patients were rehabilitated, but were excluded because they had no confirmed diagnosis of cancer or the information was not possible to be collected in the respective medical records.

The distribution of patients according to demographic characteristics, smoking and drinking habits and family history of cancer are shown in Table 1. The distribution of patients according to the treatment and characteristics of the tumor is shown in Table 2.

Figure 1 shows the flowchart of the characteristics of prosthetic rehabilitation and reasons for not completing the prosthetic treatment.

The analysis of the association between age, marital status, city of origin and cancer staging with the completion of the prosthesis using multivariate logistic regression is shown in Table 3. The association between the stage of cancer and the reason for not performing the prosthesis using multivariate logistic regression is shown in Table 4.

## Discussion

Cancer patients rehabilitated with dental and/or maxillofacial prostheses are elderly and the main reason for not concluding the treatment was the patient's death. The population studied was predominantly of married and retired men. As for the origin 52% of the patients are from cities in the interior of the state and 70.3% of the patients are brown. Caetano et al.<sup>13</sup>, evaluated the quality of life, body image and self-esteem in patients with sequelae after treatment of head and neck cancer, candidates for prosthetic rehabilitation. They had a sample of 10 patients, and also found a predominance of male patients (60%); 50% married; 30% aged 51 to 60 years, 40% farmer, 30% retired; 60% were from the interior of the state.

In a study by Rettig and D'Souza<sup>14</sup>, they mention that two of the main causes of head and neck cancer are the use of tobacco and alcohol. Gomes et al.<sup>15</sup>, analyzed 33 patients, where 84.38% and 87.50% of the individuals used or were still in use of tobacco and alcohol respectively.

The most affected anatomical sites by the tumors in this population were head/neck (57.4%), breast (12.1%) and prostate (10.3%). Breast and prostate cancer are among the most prevalent in Brazil<sup>16</sup>, the greater number of patients with tumors in the head and neck in this study can be explained because these patients always have their oral health analyzed in the Dentistry Department before starting the anitineoplastic treatment and, with that, they already establish a connection, returning later for oral rehabilitation.

The most frequent histopathological diagnosis was epidermoid carcinoma with 141 cases (55.1%) and the most frequent disease staging was IV with 74 cases (28.9%). Epidermoid carcinoma is the most frequent malignancy among tumors in the head and neck region and the sixth most common cancer worldwide<sup>17</sup>.

Of the population studied, 154 patients (60.2%) completed their rehabilitation with dental prostheses, including 3 facial prostheses, 148 maxillary prostheses, including 11 obturators, and 126 mandibular prostheses. Quispe et al.<sup>18</sup>, evaluated 75 individuals, but of this group only 30 were cancer patients. The research assessed the need for maxillary and mandibular prostheses, the data collected were: 21 patients needed a maxillary prosthesis: to replace one element (10%), to replace more than one element (33.3%), needs prosthesis combination (13.3%) total prosthesis (13.7%); 29 patients used mandibular prosthesis: to replace more than one element (70%), required the combination of prostheses (3.3%), total prosthesis (23.7%). Joo et al.<sup>7</sup>, cites in his research that patients undergoing oncological treatments may have several sequelae, impairing masticatory function, swallowing, aesthetics, so the use of total or partial obturator prosthesis is an alternative to remedy such sequelae and enable a better quality of life for the patient Parameswari et al.<sup>19</sup> also concluded in their research that prosthetic rehabilitation with obturator prosthesis restores the missing intraoral structures and acts as an anatomical barrier between the oral and nasal cavities, restoring function and aesthetics.

The study was carried out at the Cancer Hospital of Mato Grosso, located in the city of Cuiabá, MT. The Cancer Hospital of Mato Grosso uses a unique medical record for each patient, regardless of the treatments that are performed in different departments of the institution. When working with the medical

records, there was a lack of relevant information. The absence of this information impaired the analysis and represents a limitation of this study. This limitation is often found in studies that work with secondary databases, which were not collected specifically for research. However, it is compensated by the possibility of providing information on a large number of patients quickly and agile over an extended period of time<sup>20</sup>.

## Conclusion

The patient rehabilitated with dental and maxillofacial prostheses is mainly male, elderly, brown, married, from cities in the interior of the state, smoker and alcoholic with a history of cancer in the family. They had cancer in the head and neck, the epidermoid carcinoma type, in stage IV and underwent surgery, radiotherapy and chemotherapy. The most performed prostheses were total. The main reasons for not completing the rehabilitation were the patient's death and weakness. Patients who started treatment in more advanced stages of cancer had a greater chance of not completing prosthetic rehabilitation, and had the inconclusion of rehabilitation treatment related to death and weakness.

## Declarations

**Funding:** None to declare.

**Conflicts of interest/Competing interests:** None to declare.

**Ethics approval:** This study was approved by the Human Research Ethics Committee of the University of Cuiabá (UNIC), protocol #3.740.742.

**Consent to participate:** Yes.

**Consent for publication:** Yes.

**Availability of data and material:** Not applicable.

**Code availability:** Not applicable.

**Authors' contributions:** **All authors have made** substantial contributions to conception and design, acquisition of data, analysis and interpretation of data. **All authors participated** on drafting the article or revising it critically for important intellectual content. **All authors** approved of the version to be published and all subsequent versions.

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## Tables

Table 1. Distribution of patients according to demographic characteristics, smoking and drinking habits and family history of cancer (n=256).

<b>Variable</b>	<b>Groups</b>	<b>N</b>	<b>%</b>
<b>Age group</b>	30-40 years	7	2.7
	41-50 years	32	12.5
	51-60 years	74	28.9
	61-70 years	79	30.9
	> 70 years	64	25.0
<b>Sex</b>	Male	168	65.6
	Female	88	34.4
<b>Race/color of skin</b>	Brown	180	70.3
	White	43	16.8
	Black	23	9.0
	Yellow	4	1.6
	Indigenous	2	0.8
	Not declared	4	1.6
<b>City of origin</b>	State capital	123	48.0
	Interior of state	133	52.0
<b>Profession</b>	Retired	70	27.3
	Housework	38	14.8
	Self employed	15	5.9
	Rural worker	12	4.7
	Bricklayer	10	3.9
	Other	53	20.7
	Not declared	58	22.7
<b>Marital status</b>	Single	78	30.5
	Married	126	49.2
	Divorced	17	6.6
	Widow(er)	16	6.3
	Not declared	19	7.4
<b>Smoking habit</b>	Yes	172	67.2

	No	80	31.3
	Not declared	4	1.6
<b>Alcohol consumption</b>	Yes	138	53.9
	No	113	44.1
	Not declared	5	2.0
<b>Family history of cancer</b>	Yes	130	50.8
	No	114	44.5
	Not declared	12	4.7

Table 2. Distribution of patients according to tumor characteristics (location, histological type, staging) and cancer treatments performed (surgery, radiotherapy and chemotherapy) (n=256).

<b>Variable</b>	<b>Groups</b>	<b>N</b>	<b>%</b>
<b>Tumor location</b>	Head and neck	147	57.4
	Breast	31	12.1
	Prostate	26	10.2
	Digestive system	22	8.6
	Other	26	10.2
	Not declared	4	1.6
<b>Histological type</b>	Epidermoid carcinoma	141	55.1
	Ductal carcinoma	23	9.0
	Adenocarcinoma	45	17.6
	Non-Hodgkin lymphoma	9	3.5
	Other	26	10.2
	Not declared	12	4.7
<b>Staging</b>	I	9	3.5
	II	23	9.0
	III	46	18.0
	IV	74	28.9
	Not declared	104	40.6
<b>Surgery</b>	Yes	180	70.3
	No	76	29.7
<b>Radiotherapy</b>	Yes	182	71.1
	No	74	28.9
<b>Chemotherapy</b>	Yes	162	63.3
	No	94	36.7

Table 3. Analysis of the association of age, marital status, city of origin and cancer staging with the conclusion of the prosthesis using multivariate logistic regression.

Explanatory variable	B	P	Odds Ratio	IC 95%
Age	-0.214	0.214	0.807	0.576 – 1.132
Staging	-0.425	<b>0.048</b>	1.530	1.003 – 2.333
City of origin	0.017	0.962	1.017	0.497 – 2.082
Marital status	0.662	0.078	1.938	0.928 – 4.050

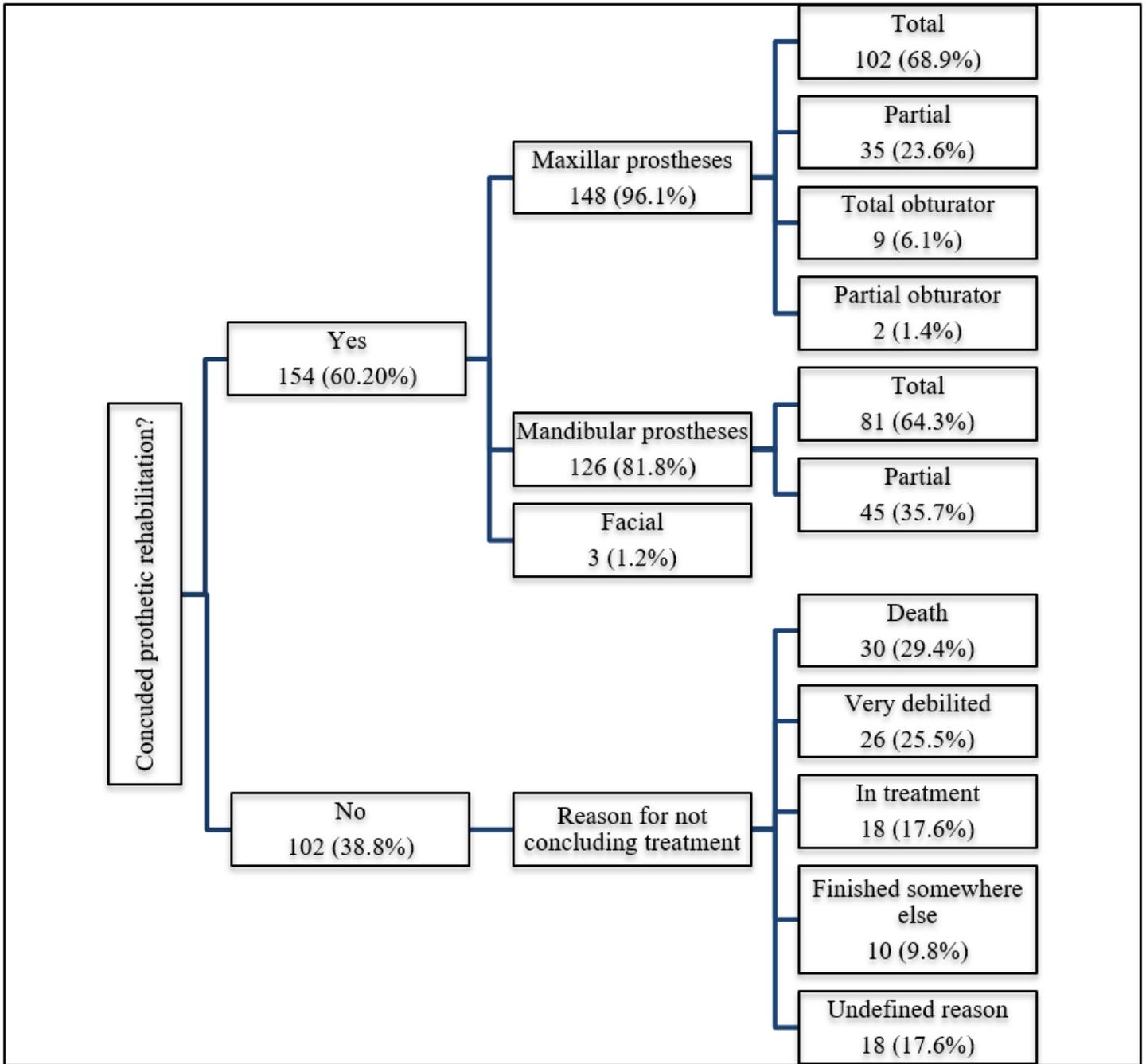
\* Overall chi-square = 9.095 with 4° degrees of freedom and p = 0.059.

Table 4. Analysis of the association of age, city of origin and cancer stage with the reason for not completing the prosthesis using multivariate logistic regression.

Category	Explanatory variable	B	p	Odds Ratio	IC 95%
<b>Without defined reason</b>	Staging	-0.449	0.525	0.638	0.160 – 2.544
	City of origin	-0.046	0.955	0.955	0.194 – 4.698
	Age	-0.163	0.637	0.850	0.431 – 1.673
<b>Debilitated patient</b>	Staging	-1.128	<b>0.041</b>	0.324	0.110 – 0.953
	City of origin	1.176	0.101	3.241	0.794 – 13.23
	Age	0.079	0.794	1.083	0.597 – 1.961
<b>In treatment</b>	Staging	-1.032	0.074	0.356	0.115 – 1.107
	City of origin	0.244	0.742	1.277	0.298 – 5.465
	Age	-0.224	0.480	0.799	0.429 – 1.489
<b>Finished somewhere else</b>	Staging	-2.073	<b>0.007</b>	0.126	0.028 – 0.563
	City of origin	0.243	0.869	1.275	0.070 – 23.15
	Age	-0.952	0.106	0.386	0.122 – 1.224

\* Overall chi-square = 20.483 with 12° of freedom and p = 0.058.

## Figures



**Figure 1**

Flowchart of prosthetic rehabilitation characteristics and reasons for not completing the prosthetic treatment.