

# Investigation of Consultations Requested by Dermatology Inpatient

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Submitted to: JMIR Dermatology  
on: February 13, 2024

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# Investigation of Consultations Requested by Dermatology Inpatient

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## Abstract

**Background:** Whereas dedicated dermatology wards have been closed in some countries, they continue to exist in other countries. Inpatient consultations requested from dermatologists have been investigated widely. However, those requested by dermatologists have been taken into consideration only in a few studies.

**Objective:** In this study, it was purposed to investigate such consultations especially in context of diagnoses, reasons, and consulting specialities.

**Methods:** Admissions to a dermatology ward of a tertiary hospital were retrospectively analyzed for a period from January 2019 to August 2021.

**Results:** We found 1712 (1259 medical and 453 surgical) consultations belonging to 548 admissions with a median length of stay of 15.1 days. Whereas number of consultations per admission was not influenced by patient's sex, it was positively correlated by patient's age and length of stay. Highest numbers were observed in admissions with a diagnosis of bullous pemphigoid, leg ulcer, lupus erythematosus, pustular psoriasis, hidradenitis suppurativa, and pemphigus. Reasons of consultations were, in a descending order, management of comorbidity, evaluation for drug precaution, investigation for etiology, evaluation for systemic involvement, taking treatment advice, obtaining biopsy, and differential diagnosis.

**Conclusions:** Our findings that number of consultations per admission was high and the most common reason of consultations was comorbidity indicate that, practically, there are no more pure dermatological patients. Therefore, if dedicated dermatology wards will continue to exist, in order to lower number of consultations so length of stay, dermatologist should be trained in a manner so that they have more knowledge about common comorbidities.

(JMIR Preprints 13/02/2024:57346)

DOI: <https://doi.org/10.2196/preprints.57346>

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## Original Manuscript

## ABSTRACT

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**Keywords:** Inpatient dermatology, Consultation, Ward, Length of Stay, Comorbidity

## INTRODUCTION

Inpatient dermatology consultations requested by other specialities have been a subject of many studies. The most common requesting specialities were found to be medical specialities such as internal medicine and hematology/oncology.<sup>1-3</sup> In most studies, the top three dermatologic disorders diagnosed by dermatologists were infections, inflammatory diseases such as dermatitis, and drug reactions.<sup>1,2,4</sup> In a study done in a veterans affairs hospital, drug reactions were replaced by skin neoplasms in this list.<sup>5</sup>

There are only a few studies mentioning consultations requested from other specialities for patients admitted to dermatology wards. The rate of such consultations were found to be 54% of patients or 63% of admissions.<sup>6,7</sup> The top two specialities were pediatrics and immunology in an Australian study, and endocrinology and internal medicine in an Indian study. However, these studies did not examine reasons of such consultations and distribution of these reasons according to diagnoses and specialities.

## OBJECTIVE

In fact, in order to develop strategies for more effective care of hospitalized dermatological patients, it will be useful to uncover such reasons and distributions. So, we purposed to review numbers and reasons of consultations in patients admitted to our dermatological ward with respect to diagnoses and specialities.

## MATERIALS AND METHODS

We retrospectively analyzed electronic medical records of patients admitted to our dermatological ward belonged to the tertiary hospital of University of Çukurova (Adana, Turkey) from January 2019 to August 2021. Patients staying as a day-case for therapeutic purposes were excluded. The following data was extracted from these records: patient's age and gender, primary diagnosis for stay, attending physician, length of stay, reasons of consultations, consulting specialities, and number of imaging tests. In calculation of number of consultations, the number of different specialities was used. In other words, even if a patient was consulted to a given speciality for more than once, for such a consultation, we added only 1 to number of consultations. On the other hand, if a speciality was consulted for more than one reasons, all reasons was used in the analysis.

Consultations had been requested to obtain a biopsy, to make a differential diagnosis, to investigate etiologies, to detect systemic involvements, to detect and solve problems related to special drug usages, to get advice for treatment, and to manage comorbidities or complications. So, reasons were grouped into seven categories. These were labeled with "biopsy", "diagnosis", "etiology", "systemic involvement", "drug precaution", "treatment advice", and "comorbidity", respectively.

Statistical analysis was done in R software.<sup>8</sup> Associations with number of consultations were evaluated using Mann-Whitney U test for "patient's gender", Spearman's rank correlation test for "patient's age" and "length of stay", and Kruskal-Wallis test for "primary diagnosis for stay" and "attending physician". Spearman's rank correlation test was also used to assess associations between number of medical or surgical consultations and number of imaging tests. By using chi-squared test, reasons for all consultations were compared to reasons for consultations requested from each speciality and to reasons for consultations requested in admissions with each diagnosis in terms of frequency.

## RESULTS

We found 548 admissions belonging to 473 patients in the records of the period examined in the present study. Four hundred fifteen patients had one admission; 44 patients, two admissions; 12 patients, three admissions; 1 patient, four admissions; and 1 patient, five admissions. Two hundred thirty one patients were males; and 242, females. Thirty four patients were younger than 18 years old. This calculation was done according to the first admission, if a patient had more than one admission.

Mean and median length of stay were 15.1 (SD  $\pm$  13.8) days and 11.5 (interquartile range [IQR], 6-19) days, respectively. The top five primary diagnoses for stay were non-pustular psoriasis, prurigo/pruritus, urticaria/angioedema, bullous pemphigoid, and pemphigus (Table 1). Median length of stay was equal to or greater than 19 days for some diagnoses, namely pemphigus, cutaneous leishmaniasis, pyoderma gangrenosum, bullous pemphigoid, and leg ulcer. There were seven attending physicians.

We detected 1712 consultations requested from other specialities. Number of consultations per admission was ranged from 0 to 16 (median, 3; IQR, 1-5). Of 548 admissions, 14.1% had no consultation; 17.7%, one consultation; 17.0%, two consultations; 13.9%, three consultations; 12.0%, four consultations; 8.0%, five consultations; and 17.3%, six or more consultations (Figure 1).

Consultations had been requested more commonly from medical specialities than surgical specialities (1259 versus 453) (Table 2). The top three medical specialities were infectious diseases, hematology, and psychiatry. The top three surgical specialities were ophthalmology, otorhinolaryngology, and general surgery or gynecology. There were 1051 imaging tests. Number of imaging tests per



admission was ranged from 0 to 9 (median, 2; IQR, 1-3). This number was positively correlated both with number of medical consultations ( $r = 0.58$ ,  $p < 0.001$ ) and with number of surgical consultations ( $r = 0.36$ ,  $p < 0.001$ ).

Median number of consultations was 3 (IQR, 1-4) in admissions of male patients and 3 (IQR, 1-5) in admissions of female patients. So, there was no difference between males and females in terms of number of consultations ( $p > 0.05$ ). Number of consultations was positively correlated both with age ( $r = 0.26$ ,  $p < 0.001$ ) and with length of stay ( $r = 0.61$ ,  $p < 0.001$ ) (Figure 2). There were admissions with diagnosis of scabies in which no consultation had been requested. On the other hand, median number of consultations was greater than 3 in admissions with diagnosis of bullous pemphigoid, leg ulcer, lupus erythematosus, pustular psoriasis, hidradenitis suppurativa, and pemphigus (Table 1). Median number of consultations was significantly different between diagnostic groups ( $p < 0.001$ ). This figure was ranged from 2 to 5 according to attending physician and the difference was statistically significant ( $p < 0.001$ ).

There were two different reasons for 34 of 1712 consultations, so total number of reasons were 1746. Frequencies of reasons in 1712 consultations were as follows: comorbidity, 53.8%; drug precaution, 19.1%; etiology, 12.8%; systemic involvement, 6.0%; treatment advice, 5.4%; biopsy, 3.0%; and diagnosis, 1.9%. In a different point of view, their frequencies in 548 admissions were 65.0%, 31.8%, 28.3%, 17.0%, 13.7%, 7.1%, and 5.3%, respectively.

Comorbidity was a reason more frequently than the above general rate in consultations of admissions with diagnosis of dermatitis, pustular psoriasis, and bullous pemphigoid (Table 1). Drug precaution was such a reason for hidradenitis suppurativa, non-pustular psoriasis, pemphigus, cutaneous leishmaniasis, and bullous pemphigoid. Similarly, prominent reason was etiology for

prurigo/pruritus, erythema multiforme, and urticaria/angioedema; systemic involvement for lymphoproliferative disease, lupus erythematosus, vasculitis, and non-pustular psoriasis; treatment advice for dermatophytosis, herpes zoster, pyoderma, hidradenitis suppurativa, lymphoproliferative disease, and cutaneous leishmaniasis; biopsy for panniculitis, lymphoproliferative disease, and dermatitis; and diagnosis for drug eruption, pyoderma, and dermatitis.

Comorbidity was a reason more frequently than the above general rate in consultations requested from endocrinology, urology, nephrology, neurology, gastroenterology, cardiology, pulmonology, gynecology, and infectious diseases (Table 2). Drug precaution was such a reason in physical medicine, ophthalmology, and rheumatology consultations. Similarly, prominent reason was etiology for hematology and psychiatry; systemic involvement for rheumatology and otorhinolaryngology; treatment advice for algology, plastic surgery, infectious diseases, and cardiovascular surgery; and diagnosis for orthopedic surgery and cardiovascular surgery. Naturally, biopsy was a reason only in surgical consultations.

## DISCUSSION

Length of stay has been expressed as either mean or median in studies dealing with admissions in dermatology wards. Its mean has been reported to be ranged from 6.8 to 22.2 days.<sup>7, 9-12</sup> Its median has been reported to be ranged from 3 to 11 days.<sup>13-16</sup> Our mean was located in the middle of the above range, but our median was slightly over the upper limit of the above range. Therefore, our dermatological ward's stays could be accepted to be longer than those of most studies.

According to overall evaluation of studies from Asia<sup>7,9,10,12</sup>, America<sup>11,15,16</sup>, and Europe<sup>13,14</sup>, skin infections are the most common primary diagnosis for stay in dermatology wards. They are followed

by immunobullous diseases, psoriasis, and dermatitis. In contrast to studies from Asia, neoplastic skin diseases may also be at the top of the list of most common primary diagnoses for stay in studies from America<sup>15,16</sup> and Europe<sup>13,14</sup>. If we regroup our findings in Table 1, immunobullous diseases, skin infections, and psoriasis will be at the top of the list, as in the aforementioned studies. On the other hand, prurigo/pruritus and urticaria/angioedema will retain their top positions in the list, in contrary to other studies. This discrepancy could be explained by our preferences. In order to shorten the time, we prefer to carry out many investigations necessary for etiological evaluation of prurigo, pruritus, or chronic urticaria by hospitalizing the patient. We also prefer to hospitalize a patient with acute urticaria because of risk of life-threatening angioedema.

In our study, length of stay was longer for immunobullous diseases (namely pemphigus and bullous pemphigoid), ulcerative skin diseases (namely pyoderma gangrenosum and leg ulcer), and cutaneous leishmaniasis. Studies from Spain<sup>14</sup>, Pakistan<sup>9</sup>, and Brazil<sup>11,16</sup> also reported that immunobullous diseases caused a length of stay above the mean or median. Studies from United Kingdom<sup>13</sup> and Brazil<sup>11,16</sup> also reported that ulcerative skin diseases caused a length of stay above the mean or median. Such a longer stay was also observed for cutaneous leishmaniasis in studies from Pakistan<sup>9</sup> and Brazil<sup>16</sup>. We hospitalize patients with cutaneous leishmaniasis almost exclusively for parenteral treatments lasting at least 15 days.

One of the main results of the present study was number of consultations. We found that at least one consultation had been requested from other specialities in 86% of 548 admissions and total number of consultations was 1712. These figures were markedly higher than those of previously reported studies. In a study from Australia, it has been found that only 54% of 97 patients required consultations and total number of consultations was 91.<sup>6</sup> In a study from India, it has been found that only 63% of 1746 admissions required consultations and total number of consultations was 1736.<sup>7</sup>

This difference could be explained partly by age distribution. Both studies included more pediatric patients than our study. Adults usually have more comorbidities than children, so more consultations may be required in adults. Another explanation for this difference might be that tendency to consult other specialists may vary between dermatologists from different countries, as we observed that median number of consultations was significantly different between our attending physicians.

The most frequently consulted speciality was infectious diseases in our study, pediatrics in the study from Australia<sup>6</sup>, and endocrinology in the study from India<sup>7</sup>. However, these two studies are similar to our study in that, in dermatology wards, number of medical consultations exceeds number of surgical consultations.

Whereas we did not observe a difference between admissions of male and female patients in terms of number of consultations, we found that this number increased with an increase in age. However, a study investigating variability of inpatient consultation practices by general medicine attendings showed that patients aged 76 and older had received fewer consultations than patients aged 48 and younger.<sup>17</sup> This finding was interpreted by its authors as a more conservative practice in older patients. On the other hand, a study investigating consultation patterns in general medical services of two tertiary hospitals showed that mean age (59 years) of patients with one or more consultations was significantly greater than that (56 years) of patients without a consultation.<sup>18</sup> Moreover, a study investigating variation in inpatient consultation among older adults showed that the rate ratio of an additional consultation was significantly higher in age groups of 71-75, 76-80, and 81-85 years, as compared to the age group of 66-70 years.<sup>19</sup>

In our study, number of consultations was also influenced by primary diagnosis for stay. Its median was higher for bullous pemphigoid, leg ulcer, lupus erythematosus, pustular psoriasis, hidradenitis

suppurativa, and pemphigus. We could explain a higher median for bullous pemphigoid, pemphigus, and hidradenitis suppurativa with assessments before starting systemic therapies; for leg ulcer with etiological investigations; for lupus erythematosus with assessment of systemic involvement; and for pustular psoriasis with comorbidities.

Other main results of the present study were frequencies of reasons for consultations and their variability by consulting specialities and by primary diagnoses for stay. The most common reason was comorbidity which was observed in 53.8% among consultations and in 65.0% among admissions. This finding indicates that most patients hospitalized in a dermatology ward are no more “pure dermatological patients.”

When one reviews our frequencies of reasons according to diagnoses, he may be confused at a first glance, since comorbidity, biopsy, and differential diagnosis were more frequent reasons in consultations requested for patients with dermatitis than in all consultations. Comorbidity was a relatively more frequent reason, since etiological investigation by other specialists, assessment of systemic involvement, and taking treatment advice from other specialists are not necessary for dermatitis. If we face a differential diagnosis between dermatitis and mycosis fungoides, before results of skin biopsies, we prefer to ask a biopsy of enlarged lymph nodes from surgical specialities and to request hematological and/or oncological evaluation.

Our frequencies of reasons according to consulting specialities are easily explainable by usual dermatological practice. For example, if a patient will start a long-course use of systemic corticosteroids, he should be evaluated for osteoporosis and for cataract. Therefore, physical medicine and ophthalmology consultations should be requested.

According to our study, number of consultations had a positive association with length of stay. Numbers of both medical and surgical consultations were also positively associated with number of imaging tests. Therefore, an increase in consultations leads to prolonged hospital stays, as stated even in 1970s.<sup>20</sup> Moreover, both prolonged hospital stays and increased imaging tests will result in higher costs to health care systems.

Whereas dedicated dermatology wards are still available in some countries such as our country and India<sup>7</sup>, starting from the last two decades of the twentieth century, such wards have decreased in the United States<sup>21</sup>. In 2018, it has been stated that only two units, one at the Mayo Clinic and the other at the University of Miami, remained in this country.<sup>22</sup> Recently, it has been questioned the best model of inpatient care for skin diseases in the United Kingdom.<sup>23</sup> For dermatological patients with multiple comorbidities, the followings have been recommended: (1) admission to a general medical ward or to a specialist elderly care ward and (2) visits by a dermatology team. This paradigm shift gave birth to a new hospitalist laboring consultative dermatology.<sup>24</sup> Such a hospitalist from Singapore has described the hospital-based dermatology to be blood and sweat instead of “a glamorous field”.<sup>25</sup> He has warned about a risk that if dermatologists are not interested in hospital-based dermatology, this field, even whole dermatology, will be absorbed by other specialities.

On the other hand, there are also opposite opinions on closure of dermatology wards. In 2013, authors reporting their experience with the dermatology inpatient hospital service at the Mayo Clinic from 2000 to 2010 used a subtitle “Why a primary dermatology inpatient service?” in the discussion section.<sup>15</sup> They thought admission to a dermatology ward to be important because of need for specialized care. In an opinion article published in 2017 and written by Spanish dermatologists, resident training in dermatology was also accepted as a reason for presence of a dermatology ward.<sup>21</sup> In a study published in 2021 and again done by Spanish dermatologists, patients with skin diseases

admitted to dermatology wards were compared to those admitted to non-dermatology wards.<sup>26</sup> The former patients were found to have a lower risk of readmission and a shortened hospital stay.

In our opinion, dermatology wards should continue to serve patients with skin diseases. However, dermatologists should be trained to cope by themselves with comorbidities, at least with most commonly seen ones, in order to reduce requests of consultations from other specialities, so prolonged hospital stays and costs to health care systems. Such a training requires restructuring of the speciality of dermatology so that dermatologists who will not only manage ambulatory patients but also hospitalized patients should gain more knowledge and experience in general medicine.

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Table 1. Frequencies of diagnoses in 548 admissions along with median number of consultations, median length of stay, and frequencies of reasons for consultations.

Diagnosis	Frequencies (%)	Median number of consultations	Median length of stay (day)	Frequencies of reasons (%) <sup>1</sup>						
				Comorbidity	Drug precaution	Etiology	Systemic involvement	Treatment advice	Biopsy	Diagnosis
Psoriasis (non-pustular)	11.5	3	12	50.3	<i>37.9</i>	0.6	<i>16.4</i>	-	1.7	-
Prurigo/Pruritus	10.9	2	9	46.6	0.6	<i>47.7</i>	-	1.7	2.9	0.6
Urticaria/Angioedema	10.6	2	7	57.1	4.5	<i>31.2</i>	6.2	0.9	-	-
Bullous pemphigoid	9.3	6	19	<i>59.9</i>	<i>25.2</i>	11.9	3.7	0.3	0.7	-
Pemphigus	8.0	4	25.5	54.1	<i>37.3</i>	6.4	4.1	0.9	1.4	-
Dermatitis	7.8	1	10	<i>70.1</i>	10.4	2.6	-	2.6	<i>7.8</i>	<i>6.5</i>
Pyoderma	5.8	2	11.5	44.9	2.6	1.3	1.3	<i>38.5</i>	1.3	<i>10.3</i>
Hidradenitis suppurativa	4.2	4	14	40.0	<i>41.3</i>	-	1.3	<i>22.7</i>	-	-
Vasculitis	3.6	3	11.5	61.8	3.9	13.2	<i>18.4</i>	1.3	1.3	-
Cutaneous leishmaniasis	3.3	1.5	21.5	45.5	<i>33.3</i>	-	3.0	<i>15.2</i>	3.0	3.0
Scabies	3.3	0	5	-	-	-	-	-	-	-
Drug eruption	2.7	2	7	66.7	-	-	7.4	-	7.4	<i>18.5</i>
Pustular psoriasis	2.6	5	17.5	<i>67.1</i>	24.3	1.4	7.1	-	1.4	-
Erythema multiforme	2.0	1	7	42.9	14.3	<i>35.7</i>	-	-	7.1	-
Pyoderma gangrenosum	1.6	3	21	56.4	7.7	20.5	-	5.1	5.1	5.1
Dermatophytosis	1.5	0	8.5	50.0	-	-	-	<i>50.0</i>	-	-
Panniculitis	1.1	2.5	9.5	46.7	16.7	23.3	-	-	<i>13.3</i>	-
Leg ulcer	0.9	5	19	57.7	-	23.1	-	11.5	7.7	3.8
Lupus erythematosus	0.9	5	14	31.6	26.3	-	<i>36.8</i>	-	5.3	-
Herpes zoster	0.9	3	6	55.6	-	-	5.6	<i>38.9</i>	-	-
Lymphoproliferative	0.9	2	9	31.2	-	-	<i>43.8</i>	<i>18.8</i>	<i>12.5</i>	-
Others	6.4	3	11	49.6	8.3	8.3	6.0	10.5	10.5	6.8
All diagnoses	-	3	11.5	53.8	19.1	12.8	6.0	5.4	3.0	1.9

<sup>1</sup> Frequencies which were significantly higher than those of all diagnosis were written in italic font.



Table 2. Frequencies of consultations for each speciality in 548 admissions along with frequencies of reasons.

Section <sup>1</sup>	Frequencies of consultations (%)	Frequencies of reasons (%) <sup>2</sup>						
		Comorbidity	Drug precaution	Etiology	Systemic involvement	Treatment advice	Biopsy	Diagnosis
Medical specialities								
Infectious diseases	44.9	65.9	14.6	1.2	-	20.7	-	2.4
Hematology	39.6	23.0	13.4	58.5	3.7	-	-	2.3
Psychiatry	20.8	58.8	-	40.4	-	0.9	-	-
Physical medicine	19.3	17.9	83.0	-	-	-	-	-
Endocrinology	17.9	92.9	6.1	1.0	-	-	-	-
Rheumatology	15.9	14.9	28.7	5.7	54.0	1.1	-	4.6
Nephrology	13.5	90.5	6.8	1.4	-	2.7	-	-
Cardiology	12.6	79.7	21.7	-	-	-	-	-
Pulmonology	12.2	70.1	20.9	6.0	-	-	-	3.0
Gastroenterology	10.9	83.3	15.0	3.3	-	-	-	-
Neurology	10.8	88.1	1.7	1.7	3.4	3.4	-	1.7
Oncology	3.6	50.0	10.0	25.0	15.0	5.0	-	-
Surgical specialities								
Ophthalmology	24.5	32.1	62.7	-	6.7	-	0.7	-
Otorhinolaryngology	14.1	51.9	-	6.5	31.2	-	11.7	-
General surgery	8.2	66.7	2.2	2.2	-	11.1	17.8	-
Gynecology	8.2	68.9	6.7	22.2	-	-	2.2	-
Urology	5.8	90.6	3.1	3.1	-	3.1	-	-
Plastic surgery	5.7	12.9	-	-	-	22.6	64.5	-
Orthopedic surgery	4.6	40.0	-	-	-	8.0	8.0	44.0
Cardiovascular surgery	3.5	52.6	-	26.3	-	15.8	-	10.5
Algology	3.1	41.2	-	-	-	58.8	-	-
All sections	-	53.8	19.1	12.8	6.0	5.4	3.0	1.9

<sup>1</sup> Pediatric specialities, medical genetics, intensive care, anesthesiology, neurosurgery,

reanimation, and pediatric surgery consultations were not included in this table, since their frequencies were low, namely 0.2% to 2.4%.

<sup>2</sup> Frequencies which were significantly higher than those of all sections were written in italic font.

Figure 1. Frequency of consultation number.

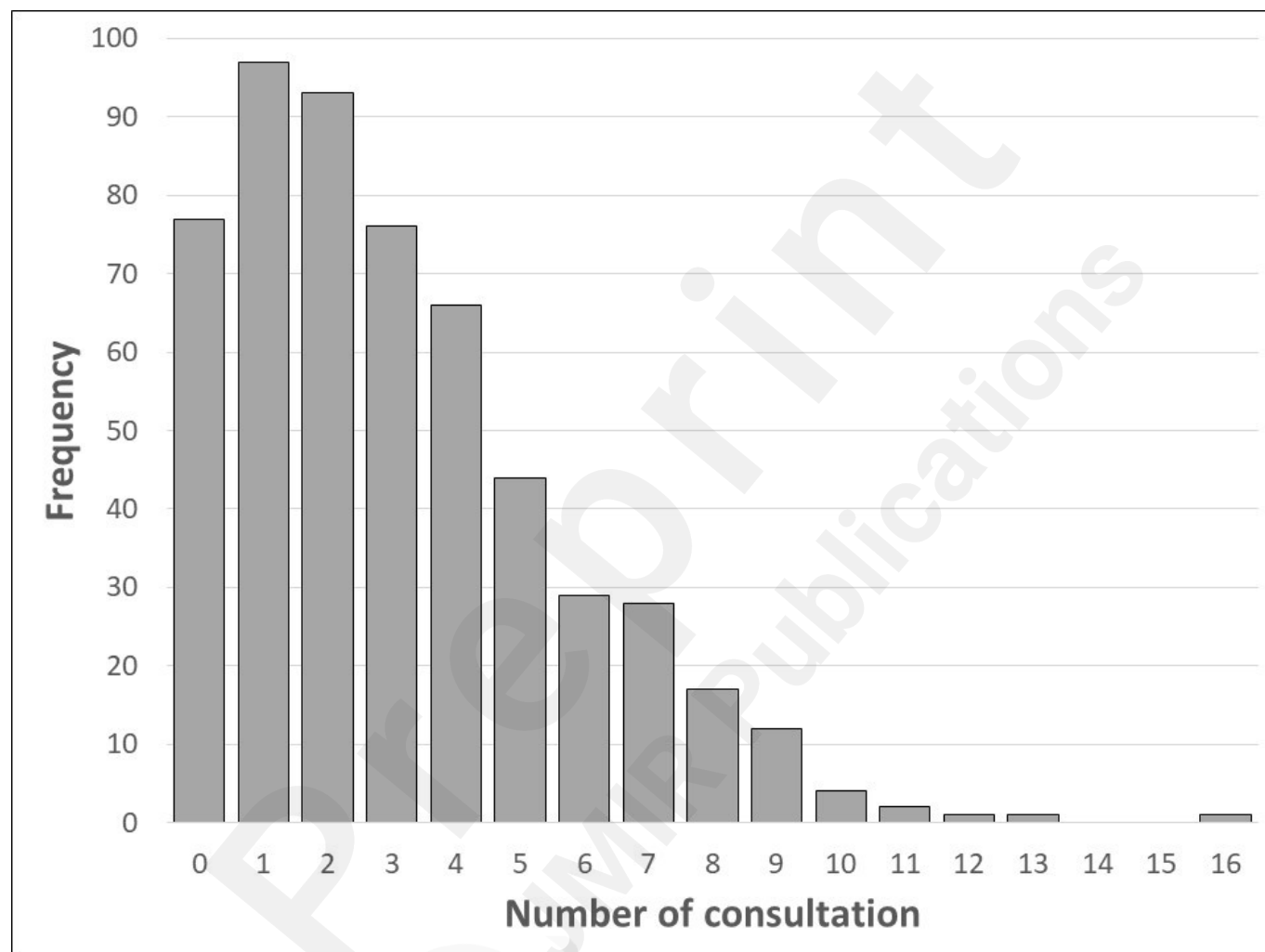
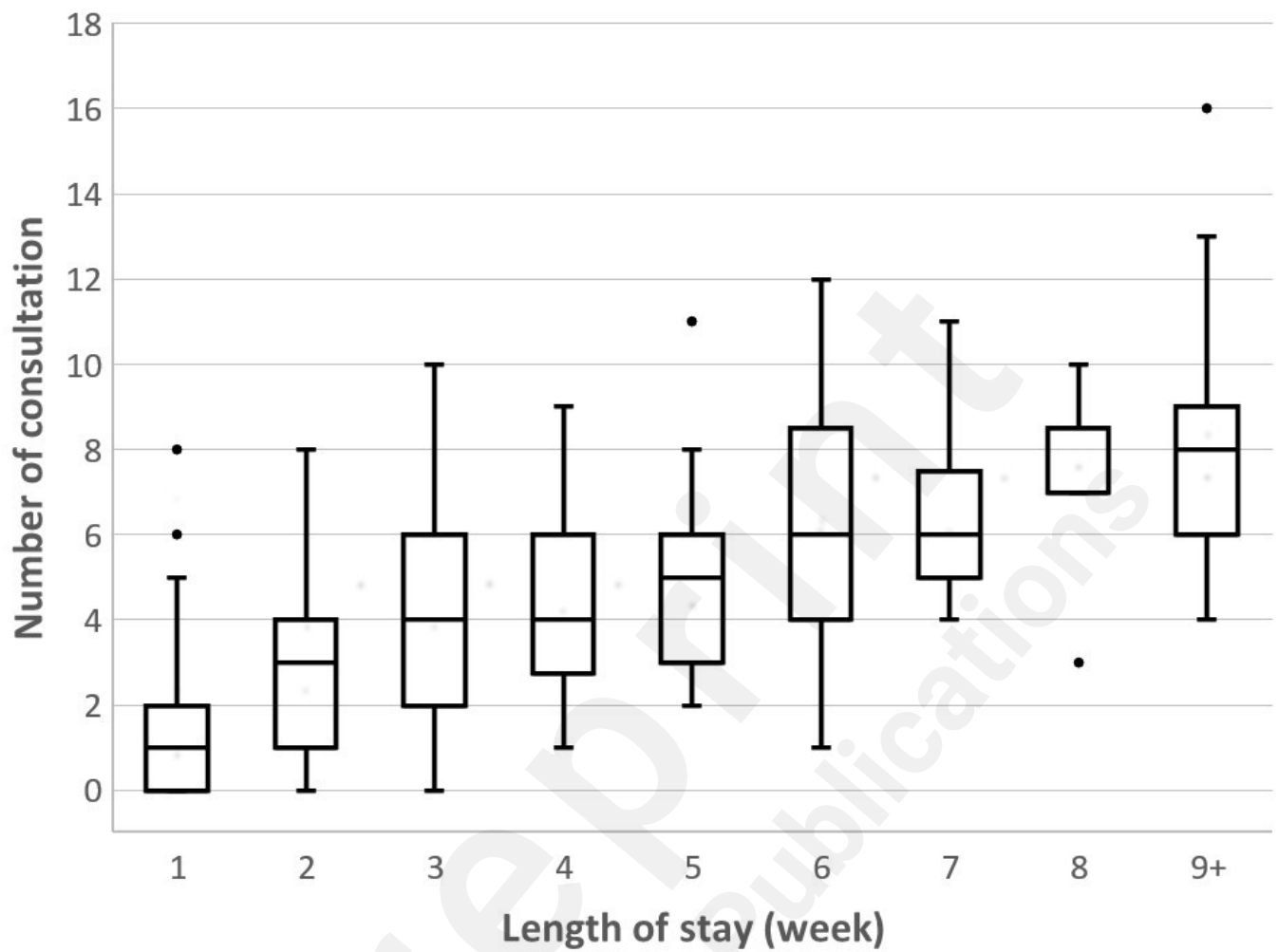


Figure 2. Relationship between length of stay and number of consultations.



## Supplementary Files