

# Students' Utilization of Health Services: A Hospital-Based Study in Mansoura University, Egypt

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## ABSTRACT

This study aims to describe the patterns of morbidity, investigations and drug prescription among patients of Students' Hospital, Mansoura University. This is a hospital-based descriptive study including both outpatients and inpatients students. The questionnaire for the outpatients' students was completed by the treating doctor. Data of inpatients' students was collected retrospectively from the records. Diseases of the skin and subcutaneous tissue and diseases of the eye and adnexa were the most frequent outpatients' morbidity. The most frequent morbidities among inpatients are diseases of the skin and subcutaneous tissue, diseases of the musculoskeletal system and connective tissue, and diseases of the respiratory system. The average length of hospital stay was 2.8 days. The mean number of drug prescribed for outpatients and inpatients were 1.5 and 5.9; respectively. University students suffer a variety of morbidities. College health must move away from focusing on disease and move towards health promotive and preventive measures.

**Key words:** Morbidity, niversity students, prescription

## Öğrenci Sağlık Hizmetleri Kullanımı: Mısır Mansoura Üniversitesi'nde, Hastane Tabanlı Bir Çalışma

### ÖZET

Mansoura Üniversitesi hastanesindeki öğrenci hastaların morbidite, sorgulama ve ilaç reçetelerini tanımlamaktır. Bu hem ayaktan hem de yatan hasta öğrencileri içeren hastane tabanlı tanımlayıcı bir çalışmadır. Ayaktan öğrencilerin anketleri tedavi eden doktor tarafından tamamlandı. Yatarak tedavi gören öğrencilerin verileri retrospektif olarak dosyalarından toplandı. Ayaktan hastalarda en sık morbidite nedenleri; deri ve deri altı doku, göz ve adnekslerin hastalıklarıydı. Yatanlarda en sık morbidite nedenleri; deri ve deri altı doku, kas-iskelet sistemi ve baş dokusu ve solunum sistemi hastalıklarıydı. Hastanede ortalama kalış süresi 2,8 gün idi. Ayaktan ve yatarak tedavi görenlerde reçete edilen ilaç sayıları sırasıyla ortalama 1.5 ve 5.9 idi. Üniversite öğrencilerini çeşitli morbiditeler etkilemektedir. Üniversite sağlığı hastalıklara odaklanmaktan uzaklaşmalı ve teşvik edici ve önleyici tedbirlere doğru hareket etmelidir.

**Anahtar kelimeler:** Morbidite, üniversite öğrencileri, reçete

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## INTRODUCTION

The health and wellness of college students is impacted by their overall lifestyles and the environment around them (1). University students are mainly in the late adolescent and early adulthood (2), at the same time they are just beginning to made independent decisions about health (3). Previous research described a pyramid approach to understand college student' health issues, serious troubles including chronic diseases are at the top of this pyramid (4,5).

Characteristics of students attending to higher education sometimes can show us the description of society, because they come from very different regions representing the all country (6). Health research has relatively neglected the young adult population, most likely attributable to the fact that young adults typically perceive themselves to be unsusceptible to infirmity and usually experience optimal levels of health (7). Institutions of higher education (i.e. universities, colleges) provide a venue for providing interventions to assist students in coping with their health problems/issues (7). University students to some extent reflect their community with regard to health and health-related problems. This age group is vulnerable to multiple factors that induce morbidity and encourage certain

disease conditions. Definition of the patterns and variations of these problems will help in the provision of comprehensive health care and subsequent health promotion of this important age group (8).

Youths, especially those enrolled in university education are nation's strength, hopes and future. Thus it is pertinent to study the health situation of university students in Egypt. There are some small-scales studies on mental and psychiatric morbidities among students of the Egyptian universities (9,10). However data regarding physical morbidity among university students are not available. Data on morbidity condition of university students, if made available will help to design the preventive and therapeutic measures. The objectives of this study are to identify patterns of morbidity, investigations and drug prescription among both outpatients and inpatients of Students' Hospital, Mansoura University.

## MATERIALS AND METHODS

**Setting:** Mansoura Students' Hospital is a secondary care 14 beds hospital providing both preventive and curative free health services to students affiliated to Mansoura University, Egypt. Mansoura University was founded in 1972 in Mansoura city, Egypt. It is one of the

**Table 1.** Socio-demographic features of studied students

	Outpatients n(%)	Inpatients n(%)
<i>Total</i>	2050(100)	443(100)
<i>Age (years): Min-Max (Median)</i>		
<i>Mean±SD</i>	14-30 (20.0)	16-29(20.0)
	20.2±1.8	19.8±1.3
<i>Sex: Male</i>	981 (47.9)	281(63.4)
<i>Female</i>	1069 (52.1)	162(36.6)
<i>Family residence: Urban</i>	734 (35.8)	220(49.7)
<i>Rural</i>	1316 (64.2)	223(50.3)
<i>College: Law</i>	367(17.9)	90(20.3)
<i>Education</i>	318(15.5)	45(10.2)
<i>Commerce</i>	251(12.2)	83(18.7)
<i>Arts</i>	213(10.4)	76(17.2)
<i>Engineering</i>	209(10.2)	33(7.4)
<i>Medicine</i>	122(6.0)	25(5.6)
<i>Sports education</i>	121(5.9)	22(5.0)
<i>Pharmacy</i>	114(5.6)	9(2.0)
<i>Nursing</i>	85(4.1)	12(2.7)
<i>Sciences</i>	66(3.2)	16(3.6)
<i>Tourism &amp; Hotels</i>	51(2.5)	2(0.5)
<i>Agriculture</i>	44(2.1)	12(2.7)
<i>Veterinary Medicine</i>	37(1.8)	5(1.1)
<i>Computer and Information Technology</i>	24(1.2)	24(5.4)
<i>Kindergarten</i>	16(0.8)	0
<i>Dentistry</i>	12(0.6)	6(1.4)

**Table 2.** Distribution of studied students according to clinic/department they attended, nature of visit, referral and admission rates, and length of stay.

	Outpatient n(%)	Inpatients n(%)
<i>Clinic/Department:</i>		
Internal medicine/chest	568(27.7)	13(2.9)
Dermatology	504(24.6)	0
Ophthalmology	318(15.5)	37(8.4)
Orthopedic	151(7.4)	104(23.5)
General surgery	133(6.5)	163(3.7)
Dental	131(6.4)	0
Ear, Nose and Throat	73(3.6)	101(22.8)
Rheumatology/Rehabilitation	59(2.9)	2(0.5)
Gynecology/obstetric	43(2.1)	1(0.2)
Urology/Nephrology	38(1.9)	20(4.5)
Psychiatry/Neurology/Neurosurgery	32(1.6)	2(0.5)
<i>Nature of visit/admission:</i>		
Initial	1575(76.8)	402(90.7)
Follow-up/readmission	475(23.2)	41(9.3)
<i>Referred to other hospitals</i>		
Admission rate*	45(2.2)	0
Length of hospital stay: Min - Max (Median)	61(3.0)	Not applicable
Mean $\pm$ SD	Not applicable	1-36(2.0)
	2.8 $\pm$ 3.8	

\*General surgery (22), Orthopedics (8), Urology (6) and Internal medicine (3) departments

biggest public Egyptian universities and has contributed much to the cultural and scientific life in Mansoura and Egypt. The University provides a number of students' services within the campus which include: Students' services complex containing restaurants, stationeries and a student hospital, three students' accommodation complexes, and Olympic village.

**The main Campus is located in Mansoura city. It comprises 13 faculties:** medicine, education, science, pharmacy, dentistry, commerce, law, engineering, agriculture, nursing, veterinary medicine, physical education; as well as computer science and information systems. Four faculties are located off campus, which are: arts, special education, tourism and hotels, and kindergartens. A total of 124386 students were enrolled in all faculties during study period.

**Target population:** Students of Mansoura university attending both outpatients and inpatients departments of Mansoura Students' Hospital.

**Methods:** The outpatients' study was carried out through a period of one year (from January to December, 2010). During this period a total of 14409 out-patients visits were recorded, out of these 443 (3.1%) were admitted to inpatients departments. All attendants during a day in each week were included in the study. The days were changing every week to cover all the 6 working

days throughout the year to cover any seasonal or diurnal variations in the pattern of morbidity. A total of 2050 outpatients' students were interviewed. The inpatients' study covered all admissions throughout the year of 2010.

**Approach:** The questionnaire for the outpatients' students was completed by the treating doctor, after adequate orientation about the objective of the study and questionnaire contents. Data of inpatients students was collected retrospectively from the records. Data collected included sociodemographic features, diagnosis, investigation done and treatment provided. Hospital admission was included in questionnaire of outpatients' student and length of hospital stud was included in the data collection form of inpatients students.

The morbidity was analyzed using the International Classification of Diseases-10 (ICD-10) coding for identifying the morbidity patterns presenting at both outpatients and inpatients departments of the hospital. The study protocol was approved by the research ethics committee of College of Medicine, Mansoura University. Also outpatients' students gave their verbal consent to participate in the study. Data was analyzed using SPSS Packages version 16. Categorical variables were presented as number and percent, while quantitative variables were presented as mean  $\pm$  SD.

**Table 3.** Pattern of disease among studied students

Number of diseases diagnosed per student		Outpatient n(%)	Inpatients n(%)
No disease (free)		36(1.8)	0
One disease		1959(95.6)	443(100)
Two diseases		55(2.7)	0
ICD-10			
Total diseases		2069(100)	443(100)
Block	Title	N (%)	N (%)
A00-B99	Certain infections and parasitic diseases	245(11.8)	4(0.9)
C00-D48	Neoplasms	17(0.8)	20(4.5)
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	91(4.4)	6(1.4)
E00-E90	Endocrine, nutritional and metabolic diseases	91(4.4)	14(3.2)
F00-F99	Mental and behavioural disorders	21(1.0)	0
G00-G99	Diseases of the nervous system	11(0.5)	8(1.8)
H00-H59	Diseases of the eye and adnexa	305(14.7)	37(8.4)
H60-H95	Diseases of the ear and mastoid process		21(4.7)
I00-I99	Diseases of the circulatory system	38(1.8)	2(0.5)
J00-J99	Diseases of the respiratory system	51(2.5)	48(10.8)
K00-K93	Diseases of the digestive system	120(5.8)	54(12.2)
L00-L99	Diseases of the skin and subcutaneous tissue	534(25.8)	64(14.4)
M00-M99	Diseases of the musculoskeletal system and connective tissue	206(10.0)	63(14.2)
N00-N99	Diseases of the genitourinary system	80(3.9)	31(7.0)
O00-O99	Pregnancy, childbirth and the puerperium	15(0.7)	1(0.2)
P00-P96	Certain conditions originating in the perinatal period	0	0
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities	1(0.05)	27(6.1)
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	178(8.6)	0
S00-T98	Injury, poisoning and certain other consequences of external causes	34(1.6)	41(9.3)
V01-Y98	External causes of morbidity and mortality	3(0.1)	2(0.5)
Z00-Z99	Factors influencing health status and contact with health services	0	0
U00-U99	Codes for special purposes	0	0

## RESULTS

Table 1 reveals that mean ages are 20.2 and 19.8 years for both outpatients and inpatients students; respectively. About 52% of outpatients and 36.6% of inpatients students are females. Most of outpatients' students are from rural areas (64.2%). Table 2 reveals that more than half of the outpatients' students attend the internal medicine/chest and dermatology clinics. On the other hand, the most frequent admissions were to Orthopedic, and Ear, Nose and Throat departments. About 77% and 91% of outpatients and inpatients visits were initial ones. Among the outpatients, 3% were admitted to the hospital. The average length of hospital stay was 2.8 days. Diseases of the skin and subcutaneous tissue and diseases of the eye and adnexa were the most frequent outpatients morbidity, 25.8 and 14.7%; respectively. The

most infectious diseases are upper respiratory tract infections (data not shown in tables).

The most frequent morbidity among inpatients are diseases of the skin and subcutaneous tissue (14.4%), diseases of the musculoskeletal system and connective tissue (14.2%), and diseases of the respiratory system (12.2%) (Table 3). Table 4 reveals that about two-thirds of outpatients did not need any investigations. The frequently done investigations are CBC (10.6%), urine analysis (9.1%), X-ray (8.5%) and stool analysis (8.1%). Each of the CBC, ESR, liver function tests, serum creatinin and blood glucose were done for 93.2% of inpatients. Bacterial culture and sensitivity test, clotting and bleeding times/INR and plain X-ray were done for 71.8%, 28.9% and 18.3% of inpatients; respectively. Table (5) shows that 1.8%, 6.15 and 7.0% of outpatients' students

**Table 4.** Radiological and laboratory investigations done for outpatients and inpatients students

Investigations	Outpatient (2050) n(%)	Inpatients (443) n(%)
No investigations	1369(66.8)	13(2.9)
Radiology:		
Plain X-ray	174(8.5)	81(18.3)
Ultrasound	58(2.9)	48(10.8)
Barium enema	1(0.05)	0
CT	5(0.2)	4(0.9)
MRI	13(0.6)	3(0.7)
Intravenous pyelography/Renogram	1(0.05)	1(0.2)
Hematology:		
CBC (complete blood count)	217(10.6)	413(93.2)
ESR	52(2.5)	413 (93.2)
Hemoglobin	12(0.6)	0
Clotting or bleeding times/INR	0	128(28.9)
Clinical Chemistry:		
Liver functions (SGOT & SGPT)	23(1.1)	413(93.2)
Renal functions:		
Urine analysis	187(9.1)	60(13.5)
Serum creatinin	25(1.2)	413(93.2)
Blood glucose	36(1.8)	413(93.2)
Hormones:		
Thyroid hormones	3(0.15)	0
Prolactin & FSH	3(0.15)	0
Serum ferritin	12(0.6)	0
Semen analysis	3(0.15)	6(1.4)
Microbiology and Immunology:		
ASO/CRP	49(2.4)	0
Hepatitis C seromarkers	8(0.4)	0
Widal's test	12(0.6)	0
Bacterial culture & sensitivity	0	318(71.8)
Parasitology:		
Stool analysis	166(8.1)	1(0.2)
Anti-schistosomal-Ig M	3(0.15)	0
Ophthalmology:		
Fundus examination & Corneal topography	2(0.1)	1(0.2)
Endoscopy:		
Arthroscope & Colonoscope	2(0.1)	41(9.3)
EKG	5(0.2)	443(100)

Categories are not mutually exclusive

received assurance as a treatment, dental interventions and correction of refractive errors; respectively. Surgery was the line of treatment in 0.7% and 91.9% of outpatients and inpatients students; respectively. The mean number of drug prescribed for outpatients and inpatients were 1.5 and 5.9; respectively. The most frequently prescribed drugs are antibiotics/antiparasitics (29.9% for outpatients and 19.1% for inpatients) and analgesics/antipyretics/NSAID/muscle relaxants/anti-inflammatory (12.8% for outpatients and 16.1% for inpatients).

## DISCUSSION

Both the number and percentage of university students among the general population in Egypt have been gradu-

ally increasing. In conjunction with this trend the health status of this population has come under more focus than ever (11). Some medical conditions occur more frequently in the college-age population (12). Studying pattern of disease distribution among university students would help to inform policy makers for screening serious and important diseases. In fact we did not find any similar work to compare with; however this study might pave the way for other population-based research on health status of university students. In this hospital-based study both outpatients and inpatients students represent different colleges of the university. This heterogeneity or students mix could reflect the morbidity pattern among the general population of students. It is noteworthy that the higher percentages of sick students were from the non-practical colleges, especially col-

**Table 5.** Treatment provided to studied students

Treatment		Outpatient n(%)	Inpatients n(%)
1.No treatment (Just counseling)		36(1.8)	0
2.Dental interventions (filling, extraction, scaling, polishing, excision).		125(6.1)	0
3.Correction of refractive errors		144(7.0)	0
4.Surgery		16(0.7)	407(91.9)
5.Drug prescription		1653(80.6)	441(99.5)
6.Others:			
Sling/cast/bandage		26(1.3)	0
Diet control		31(1.5)	0
Physiotherapy		31(1.5)	2(0.5)
Ear wash		14(0.7)	0
Hemodialysis		2 (0.1)	0
Drugs prescribed			
Total drugs		2483	2603
Number of drugs per prescription:	Min-Max (Median)	1-5 (1.0)	1-8(4.0)
	Mean±SD	1.5±0.85	5.9±0.9
Drug categories*:			
Antibiotics/antiparasitics		743(29.9)	496(19.1)
Analgesics/antipyretics/NSAID/Muscle relaxants/ antiinflammatory		319(12.8)	419(16.1)
Vitamines/minerals/tonics/lipotropics		302(12.2)	5(0.2)
Corticosteroids		216(8.8)	27(1.0)
Antihistaminics		173(7.0)	13(0.5)
Dermatologic drugs (emollients, keratolytics, antidandruff, antifungal)		159(6.4)	0
Gastrointestinal (antiemetics, spasmolytics, anti- ulcer, antiacids, digestants)		183(7.4)	318(12.2)
Pulmonologics (antitussive, mucolytics, expectorants, bronchodilators)		60(2.4)	63(2.4)
Cardiovascular drugs (antihypertensives, antiarrhythmics, decongestants, vasoconstrictors)		56(2.3)	7(0.3)
Haematologics (hemostatics, packed RBCs)		8(0.3)	0
Disinfectant/antiseptics		57(2.3)	403(15.5)
Endocrinals (antidiabetics, antihyperthyroidism)		44(1.8)	5(0.2)
IV fluids		24(1.0)	435(16.7)
Ophthalmologic drugs (antimuscarics, mydriatics, cycloplegics, antimydriatics)		22(0.9)	0
Menstrual regulators		19(0.8)	0
Psychotropics		16(0.6)	0
Antiepileptics		12(0.5)	0
Antidepressants		8(0.3)	0
General and local anesthetics		35(1.4)	407(15.6)
Others (antihemorrhoids, interferon, immune-suppressants, anti-enuresis)		27(1.1)	5(0.2).

\*% was calculated from the total number of drugs prescribed

leges of law, commerce and arts. Also the percentage of both sexes is more or less equal in the outpatients students while the inpatients show excess males than females. Most of the outpatients students are from rural localities. This could be a reflection of health seeking behavior of students or differentials in both the rates and severity of morbidities. This necessitates population based study to explore these possibilities.

More than two-third of outpatients attended the departments of internal medicine/ chest, dermatology and ophthalmology. These are probably mostly a trivial or mild condition treated with drug prescriptions or correc-

tion of refractive errors. The low hospital admission rate (3.0%), the low rate of outpatients surgery (0.7%) and a very high rate of drug prescription (80.6%) support this possibility. A previous study (13) reported that hospital admission rates of Mansoura University Hospitals ranged from 9.7% to 13.9% during the period of 1996 to1999. The majority of inpatients were admitted to for surgical reasons as 91.9% of them received surgical interventions e.g. orthopedics (23.5%), and ear, nose and throat surgery (22.8). The length of hospital stay is a function of both the severity and complexity of the patient's problems (14). The average length of hospital stay was 2.8

days. A previous study<sup>13</sup> reported that average length of hospital stay in Mansoura University Hospitals was 10.5 days during the period of 1996 to 1999. In an Indian hospital the average days of youth hospitalization was 10.8 days (15).

The distribution of the clinically confirmed morbidities according to ICD-10 classification revealed that the commonest outpatients morbidities are diseases of the skin and subcutaneous tissues (25.8%), disease of the eye and adnexia (14.7%), and certain infectious and parasitic diseases (11.8%). The most infectious diseases are upper respiratory tract infections. A study at King Faisal University medical center, Saudi Arabia, revealed that about 58% of outpatients morbidities were infectious in nature, mostly respiratory, dental, gastrointestinal and skin infections. The most frequent non-infectious morbidities were muscle and joint problems, allergic conditions, gastrointestinal diseases and trauma<sup>8</sup>. In another Saudi Arabian study revealed that upper respiratory tract infections constituted 43% of complaints among adolescents aged 11 to 21 years attending primary health care centers (16). The most frequent morbidities among university students in UK were diseases of the respiratory system (16%), sexual, pregnancy and child birth consultations (16%), diseases of skin and subcutaneous tissue (12%), diseases of the genitourinary system (10.5%), severe or moderately severe mental health disorders (7%), diseases of the nervous system and sense organs (7%), infective and parasitic diseases (6.5%), accidents, poisoning and violence (6.5%), diseases of digestive system (6%), and diseases of the musculoskeletal system and connective tissues (4%) (17). Two studies among students of the University of Zimbabwe revealed that the most prevalent disease conditions were respiratory tract infections, mental and nervous disorders and urinary tract infections (18,19). Nichol, et al (20) concluded that upper respiratory tract illnesses were common and associated with substantial morbidity in university students. The authors reported about 91% college students at the University of Minnesota had upper respiratory infections. A survey of new University students in Turkey revealed that headache, allergy, anemia and gastritis were the most frequent diseases (21).

The most frequently encountered inpatients morbidities are diseases of the skin and subcutaneous tissues (14.4%), diseases of the musculoskeletal system and connective tissue (14.2%), diseases of the digestive system (12.2%), and diseases of the respiratory system

(10.8%). An Indian study among hospitalized youth revealed that the most encountered disorders are obstetric and gynecologic disorders (33.55%), accidents (12.4%), gastrointestinal disorders (7.8%), ear and eye disorders (7.1%), respiratory disorders (6.0%), Psychological disorders (5.4%) and cardiovascular disorders (4.2%) (15). In Ahmadu Bello University Health Center, Nigeria the commonest consultations was due to venereal diseases together with sex problems (17%), followed by psychiatric, respiratory and specific infections and parasitic diseases (22). A recent study in Turkey revealed that skin diseases are frequent among university students especially acne vulgaris (40% and fungal diseases (17.1%) (23).

The diseases of the skin and subcutaneous tissues are frequently encountered among both inpatients and outpatients. A Turkish study (24) found that acne and allergic/pruritic dermatosis were the most frequent among university students. It is worthy to note that no sexual and reproductive system problems were reported among our study population. This is a reflection of the conservative and religious society that prohibits out of marriage sexual relationship. About two-thirds of outpatients and about 3% of inpatients did not have investigations. This reflects the nature and severity of the diseases in both groups of students. The most frequently requested investigation for outpatients are CBC, urine analysis and stool analysis. This is going with the finding that the infectious and parasitic diseases constitute a sizable segment of morbidities. ECG, CBC, liver functions, ESR, serum creatinin and blood glucose are the routine investigation carried out for most of the inpatients. It is noticeable that bacterial culture and sensitivity was done for 71.8% of inpatients. This raises the possibility of post-surgical infections.

The outpatients' drug prescription appears to be rational with the mean number of drug per prescription was 1.5. Antibiotics/antiparasitics are by far the most frequent prescribed drugs. Analgesics/antipyretics/NSAID/muscle relaxants/antiinflammatory, and vitamins/minerals/tonics/lipotropics comes next to antibiotics/antiparasitics. Again this reflects the morbidity patterns. Bvochora et al. (18) in Zimbabwe reported an average of 1.7 drugs per case of diseases university students with analgesics and anti-infectives were the most frequently prescribed drugs (28.5% and 28.2%; respectively). A recent study in Mozambique revealed that anti-inflammatory and analgesics, systemic antiinfective and

vitamins/minerals were the most frequently used drugs among university students (25). On the other hand, the inpatients drug prescription is irrational with the mean of 5.9 drugs per prescription. It seems that prophylactics antibiotics were routinely prescribed before and after surgery. Also intravenous fluids and analgesics/antipyretics/NSAID/muscle relaxants/antiinflammatory are widely used for patients underwent surgery.

**Study limitations:** The study is of a local nature being carried out in one university. Being a hospital-based, it does not reflect the actual morbidity pattern among all university students. The findings are affected by health care utilization pattern of students. This hospital-based study support the necessity to a wide scale population study among the university students nationwide to give a full picture of health status both physical and mental of this important sector of youth population. Such findings could help in the formulation of a feasibility preventive and curative health care program. It is a common need to involve health-promoting education programs in the curriculum of all faculties and to improve the university health services. College health must move away from focusing on disease and move towards health promotive and preventive measures to decrease the load on the hospital. The use of electronic health record is recommended to monitor trends and variation in disease pattern in university students. It is necessary that physicians working in students' hospital understand students' health problems with importance of regular health screening of university students.

Further studies are needed to explore the problems of high rate of investigations as well as polypharmacy and antibiotics prescription in inpatients. Hospital staff may needs training in the rational prescription.

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