Analysis of Dermatovenerological Pathology Among Military Personnel During Outpatient Clinic Admission in Ukraine

Alina Tsysnetska (Candidate of Medical Sciences, Associate Professor, Lviv Medical University, Ukraine)
Mikhailo Chernikhovskyi (Colonel, MD of Dermato-Venerology, Ambulatory Clinic of Military Medical Clinical Hospital of the Western Region, Ukraine)
Yurii Vujtsyk (Lt. Colonel, MD, Chief of Dermato-venereological Department of Military Medical Clinical Hospital of the Western Region, Ukraine)
Corresponding author: Alina Tsysnetska

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Abstract. Amidst the rising number of COVID-19 cases, particularly due to the emergence of a new Omicron variant known as "FLIRT," Ukraine is also experiencing the prolongation of martial law and ongoing mobilization of military personnel. These concurrent events have led to a significant increase in the number of soldiers presenting with various skin lesions at military hospitals. The heightened stress, close living quarters, and potential neglect of personal hygiene during mobilization may contribute to the exacerbation and spread of dermatological and venereal diseases among troops.

This surge in dermatovenerological conditions has resulted in a substantial backlog of patients awaiting outpatient consultations. The situation underscores an urgent need to analyze the structure and prevalence of skin pathologies among military personnel, categorized by nosological entities. By conducting a thorough analysis, healthcare providers can identify common conditions, recognize patterns of disease transmission, and understand the underlying factors contributing to this increase.

Such insights are crucial for improving and optimizing the provision of specialized medical care at different levels within the military healthcare system. Enhanced understanding will facilitate the development of targeted prevention strategies, efficient resource allocation, and tailored treatment protocols. This will not only alleviate the current strain on medical facilities but also improve overall health outcomes for soldiers during this critical period. Addressing these challenges is essential for maintaining the operational readiness of the military forces and ensuring the well-being of those serving during the mobilization in Ukraine.

Keywords: skin diseases, military, outpatient clinic admission, dermatovenerologic pathology.

Introduction. The current public health consequences of the COVID-19 pandemic, SARS, and influenza, as well as complications during the treatment of patients with cardiovascular and pulmonary diseases, have been associated with significant morbidity and mortality. However, there are several important dermatological manifestations that emergency medicine clinicians should be aware of. These include etiologies that include viral vasculitis. This indicates several types of skin manifestations and may indicate suspicion of COVID-19 [1]:

- ✓ vesicles;
- ✓ distal limb ischemia;
- ✓ urticaria;
- ✓ livedo racemosis;
- ✓ chills;
- ✓ maculopapular rash;
- ✓ petechiae;
- ✓ purpura.

At the same time, 4,715,963 citizens fell ill with SARS, influenza and COVID-19 in Ukraine during the 2023-2024 epidemic season, which is 38% less than the epidemic threshold [2]. According to the results of sequencing in the National Reference Laboratory, 36 different types of coronaviruses circulating in Ukraine, which are subvariants of the Omicron virus. In terms of the course of the disease, the Omicron strain mainly proceeds as a common respiratory disease and does not cause severe oxygen dependence, but remains dangerous for risk groups:

- o with pathologies, chronic diseases and weakened immunity;

- persons over 60 years of age who are classified as a risk group, vaccination is recommended for them.

The above is also relevant for the Lviv region. Over the past two weeks, the number of people infected with COVID-19 has increased fourfold and 207 patients have been diagnosed. Two weeks ago, among citizens who sought medical help, coronavirus was detected in 51 patients (as of July 31, 2024, there were 24 patients diagnosed with COVID-19 in the Lviv Regional Clinical Infectious Diseases Hospital). The dynamics show that the number of patients has increased almost 9 times. Doctors emphasize that a variant of the Omicron strain called "FliRT" has now been detected in the EU countries neighboring Ukraine [3, 4].

It is important in the context of the spread of the number of citizens infected with COVID-19, martial law and mobilization measures, and a significant increase in the number of applications for outpatient appointments with a dermatovenereologist to conduct an analysis of data on detected skin and venereal diseases in order to improve the procedure and optimize the provision of specialized care at its various levels.

It is necessary to isolate patients with COVID-19 from healthy civilians who are preparing for military service in the army. Military personnel and civilians seek examination from a dermatovenereologist for:

- passing an examination by a military medical commission;
- transition from conscription to contract service;
- medical examination upon admission to higher military educational institutions;
- obtaining permission to engage in water sports in a pool;
- providing medical care and resolving complaints about rashes on the skin and mucous membranes;
- determination by a military medical commission of citizens who are subject to military service during wartime as [5, 6]: - fit; - temporarily unfit; - limitedly unfit, - on an individual basis, considering the relevant orders of the Ministry of Defense of Ukraine.

The purpose of the study was to analyze the nosological structure of skin and venereal diseases at an outpatient dermatovenereological clinic since the beginning of mobilization after the introduction of martial law and hostilities to defend Ukraine in order to improve the work of a military doctor-dermatovenereologist and optimize the treatment, prevention of dermatological pathology

Materials and methods. Citizens and military personnel (376 people) were examined. Forms of accounting and reporting were analyzed: journals of accounting of primary and secondary appeals of military personnel for medical care, information from medical books of military personnel kept in the medical unit. Clinical and laboratory data were analyzed: 24 female and 352 male individuals. Among them, 231 patients with dermatoses were identified. Legislative and regulatory legal acts of Ukraine on the conduct of military medical commission when identifying skin or venereal diseases were reviewed.

Analytical, clinical observation and clinical examination were used according to special dermatovenereological methods and research methods [7, 8]. The clinical diagnosis was based on the data of clinical, laboratory and instrumental examination, which was prescribed as necessary and carried out in the clinical laboratory of military hospitals using standard methods. The conclusion on suitability or temporary unsuitability for military service was provided in accordance with the relevant Orders of the Ministry of Defense of Ukraine [5, 6].

The study is a fragment of the scientific research work of the Lviv Medical University on the topic "Improvement of the drug circulation system during pharmacotherapy on the basis of evidence-based and forensic pharmacy, organization, technology, biopharmacy and pharmaceutical law" (state registration number 0120U105348, implementation period 2021-2026).

Results and discussion. The difficult social and economic situation of martial law, forced mass resettlement created risks for increasing the incidence of infectious diseases, including mycoses, among the population.

It is generally known that dermatovenereology is a branch of medicine that studies the diagnosis, treatment, and prevention of skin diseases, as well as sexually transmitted infections.

Therefore, the authors conducted a dermatological and venereal examination of 376 people, among whom 141 (37.5%) were practically healthy. 235 (62.5%) people were diagnosed with various skin or venereal pathologies. Among the patients, there were 24 (10.21%) females and 211 (89.78%) males. The age of the patients ranged from 17 to 65 years (average age – 29+/-3.4).

Sexually transmitted diseases (STDs) were detected in 4 cases (1.7%). There were asymptomatic carriers of HIV infection – 1 case, which is 0.42%. Patients who are carriers of the immunodeficiency virus with a course without symptoms are considered to be limitedly suitable for military service. If HIV infection is accompanied by the development of parasitic or infectious diseases, the formation of malignant tumor processes, other specified diseases, the conscript is released from service in peacetime and wartime [6]. Another pathology associated with sexually transmitted diseases was represented by phobia as a consequence of syphilis – 1 case (0.42%), nonspecific urethritis – 1 (0.42%) case, cicatricial phimosis – 1 (0.42%) case.

Among all detected dermatovenereological pathology (235 cases), dermatological diseases dominated in patients, which accounted for 231 (98.29 %) cases.

Table 1. Distribution of dermatological pathology by 16 groups of dermatoses without venereal diseases.

No.	Name of the group of diseases	Number of cases (abs.)	Percent (%)
1.	Pyodermas	24	10,38
2.	Fungal diseases	41	17,74
3.	Parasitic diseases	1	0,43
4.	Viral diseases	20	8,65
5.	Allergodermatoses	29	12,55
6.	Sebaceous gland diseases. Seborrhea. Rosacea.	21	9,09
7.	Skin diseases of unknown etiology	35	15,15
8.	Keratinization disorders	17	7,35
9.	Itchy dermatoses	3	1,29
10.	Hair diseases. Hair loss.	6	2,59
11.	Sweat gland diseases	11	4,76
12.	Skin pigmentation disorders	2	0,86
13.	Skin neoplasms	6	2,59
14.	Vasculitis	2	0,86
15.	Postoperative scars	9	3,82
16.	Other skin diseases	4	1,73
	Total	231	100

Analysis of dermatological pathology (a total of 231 cases) allowed to form 56 different nosological forms. The authors of the article, according to etiopathogenetic features, united them into 16 groups of skin diseases and presented them in Table 1 and Fig. 1 "Groups of dermatoses without venereal diseases".

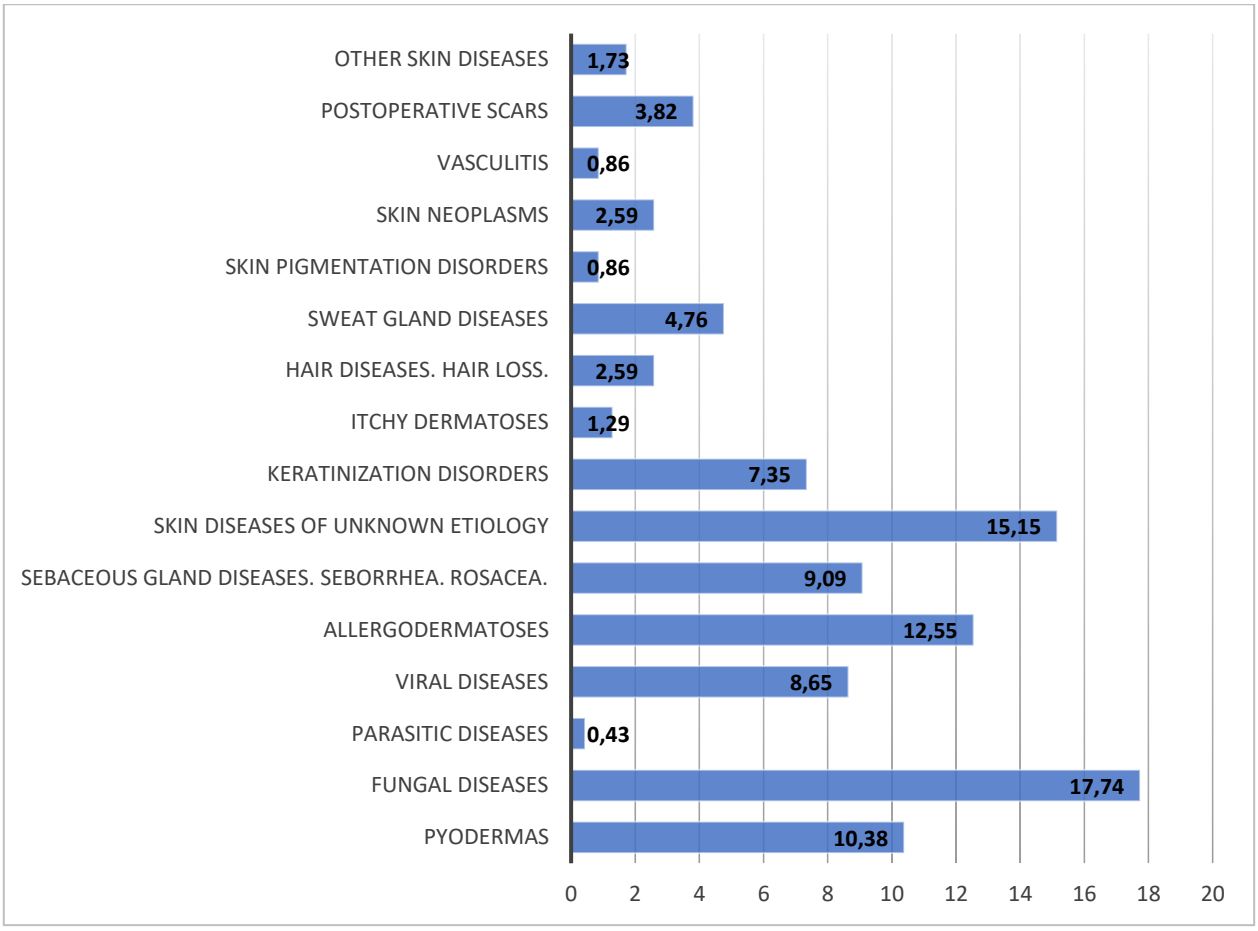

Fig. 1. Ratio (%) in 16 groups of skin diseases "Groups of dermatoses without venereal diseases".

The largest number of patients (Table 2, Fig. 2) – 198 cases (85.71%) fall on the following groups of dermatoses: fungal diseases – 41 (17.74%), diseases of unknown etiology – 35 (15.15%), allergic dermatoses 29 – (12.55%), pyodermas 24 - (10.38%), sebaceous gland diseases – 21 (9.09%), viral diseases 20 (8.65%), keratinization disorders – 17 (7.35%), sweat gland diseases – 11 (4.76%).

Table 2. The largest number of patients by groups of skin diseases.

No.	Name of the group of diseases	Number of cases (abs.)	Percent (%)
1	2	3	4
1	Fungal diseases	41	17,74
2	Skin diseases of unknown etiology	35	15,15
3	Allergodermatoses	29	12,55
4	Pyodermia	24	10,38
5	Sebaceous gland diseases. Seborrhea. Rosacea	21	9,09
6	Viral diseases	20	8, 65
7	Keratinization disorders	17	7,35
8	Sweat gland diseases	11	4,76
Total		198	85,71

The examined persons confirmed the exacerbation of already existing chronic dermatoses (psoriasis, atopic dermatitis, ichthyosis, eczema). Also, for the first time, diagnoses of dermatoses of bacterial-viral, parasitic etiology, a number of manifestations of allergic dermatoses, itchy

dermatoses, sweating disorders, changes in skin pigmentation, numerous keratinizations, various scars and scars, precancerous conditions, benign and malignant neoplasms, and other pathologies were established.

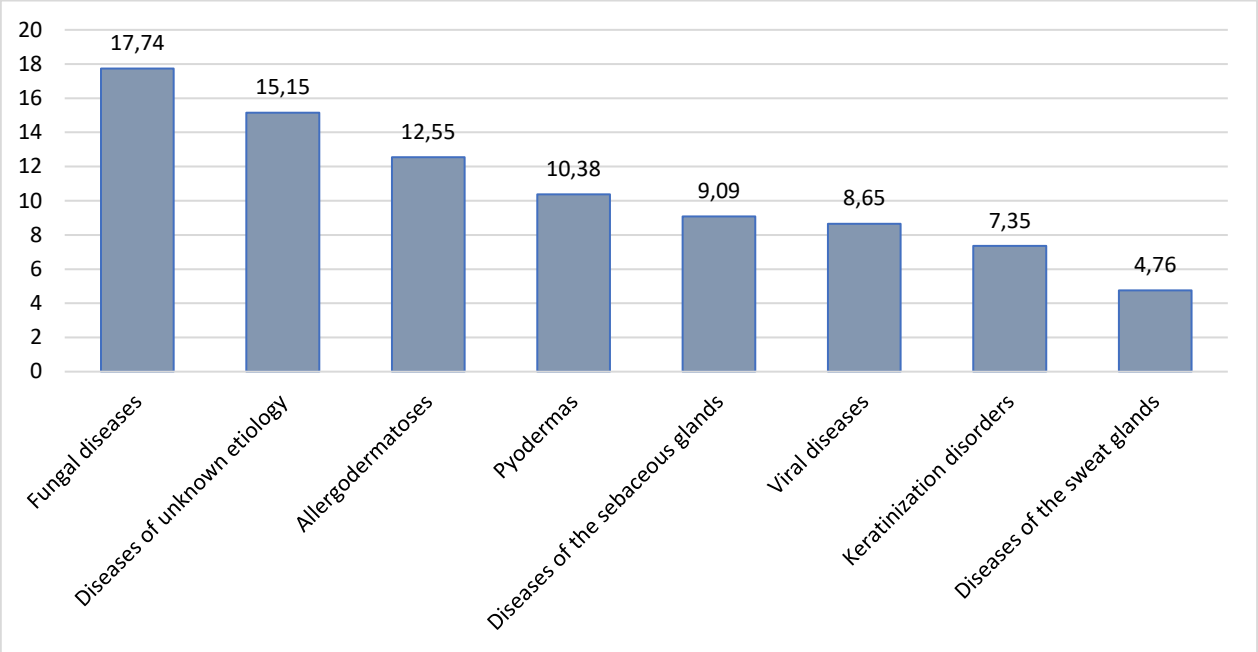

Fig. 2. Distribution of skin diseases (%) by dermatosis groups.

During the outpatient appointment, the largest number of patients had fungal diseases – 41 cases (17.44%). They were represented by 9 nosological groups. The most frequently diagnosed were foot mycoses (11 cases) with a different clinical picture, with a chronic or acute course (erythematous-squamous form, intertriginous with cracks that caused significant pain when moving). Onychomycosis of the feet (9 cases) – normotrophic or atrophic type of lesion [9-11], rubrophytia of the hands (8 cases), multi-colored lichen of the trunk (6 cases). Trichophytosis of the scalp in the occipital region was present in one subject and appeared, according to the subject, after contact with a sick dog, superficial candidiasis (4 cases), pseudomycosis – erythrasma of the inguinal folds (2 cases).

Need to note that foot mycoses in the military developed against the background of hyperhidrosis, sometimes flat feet, and improperly selected shoes and socks. In military personnel, foot hyperhidrosis is supported not only by improperly selected shoes, but also by the material from which they are made [12]. At the same time, soldiers have to walk (run) a lot and intensively, so they must have correctly selected functional, light (900 gr. – 1.0 kg) warm winter or summer tactical shoes suitable for soldiers in size, namely:

- boots, tactical boots, tactical sneakers, leggings;
- hygienic shoes must be breathable so that the foot does not freeze and must be worn correctly;
- military tactical socks must be natural, dry;
- socks act as a protective layer between the skin of the feet and shoes, wicking away sweat, reducing friction, and as a result, protect against the appearance of calluses and blisters, as well as bacteria due to antibacterial properties;
- shoes and socks must comply with established military standards that allow you to protect your feet.

It has been established that the causative agent of multi-colored lichen is yeast-like fungi of the genus Malassezia, most often Malassezia furfur, which colonize the skin of healthy citizens, especially the skin of the scalp, back of the head and shoulders. The occurrence of pathological changes is facilitated by a decrease in the protective properties of the skin: increased sweating and sebum secretion, impaired immune system function. Clinical forms of Malassezia were combined,

had stages, and turned into stable widespread forms. It has been shown that there is a relationship between Malassezia and concomitant diseases of the person. The patient's age, skin pH, constitution, development of subcutaneous tissue, its hairiness, exogenous influences (physical, chemical) - affect the course of Malassezia and the possibility of recovery [13]. In clinical practice, antifungal drugs derived from azoles (ketoconazole, clotrimazole, econazole), octopirox, selenium sulfide, zinc pyrithione are used for the treatment of Malassezia. in the form of anti-dandruff shampoos for the skin of the body – in the form of a cream. In the case of extensive lesions, systemic treatment is prescribed: fluconazole 50 mg/day for 2-4 weeks or itraconazole 200 mg/day for 7 days or 100 mg/day for 14 days. In order to avoid relapses, periodic use of antifungal shampoos is indicated [14-16].

Skin diseases of unknown etiology – 35 cases (15.15%) included psoriatic disease in 27 patients (11.48%), arthropathic psoriasis, nail psoriasis – 2 cases (0.85%), lichen planus 3 cases (1.26%), lichen rosacea of Gibert – 2 cases (0.85%), pustular bacterium Andrews (palmar-plantar) – 1 case (0.42%).

The largest number of patients was with psoriatic disease (29 cases). Psoriasis is one of the common diseases, which occupies the 4th place in the general structure of skin diseases [17]. Psoriasis affects from 2%-3% to 5%-7% of the population of the globe, in Ukraine 8-10% of the population [18, 19].

Dermatosis is characterized by a chronic course with periods of exacerbations and remissions, it is considered as a systemic autoimmune-associated disease of a multifactorial nature with a dominant role in the development of genetic factors. The etiology of psoriasis has not yet been determined. The mechanism of pathogenesis is complex, the development depends on genetic and exogenous factors containing autoimmune and autoinflammatory components. Proven that the basis of genetic predisposition to psoriasis is the HLA CW6-allele of the PSOR1 locus and HLA DR7 [20, 21]. The current level of knowledge allows us to consider psoriasis as a disease in the pathogenesis of which, along with hereditary predisposition, an important role is played not only by violations of immune homeostasis, the state of adaptation and regulation of the neuroendocrine system, but also by violations of metabolic processes [22].

Psychological and emotional stress and trauma are the most significant along with infectious – viral, drug, professional, climatic, and other triggers [23, 24].

During the military medical commission of citizens, the authors diagnosed psoriasis based on the approved criteria of the EU "Diagnosis and management of psoriasis and psoriatic arthritis in adults" (2010), the protocol for providing medical care to patients with psoriasis and arthropathic psoriasis (approved by the order of the Ministry of Health of Ukraine dated November 20, 2015 No. 752) considering diagnostic indices [25-27].

It was found that all patients in this group (29 people) were in military service since the beginning of martial law [28]. At the first military medical examination, the mobilized had psoriasis vulgaris, which was mild and limited in nature, in a stationary stage or in remission. A conscript with this form of psoriasis could be recognized as temporarily unfit or fit for the start of military service, since patients with atopic dermatitis with widespread lichenification of the skin, pemphigus vulgaris, and Dühring's dermatitis herpetiformis are excluded from military service. If there are other skin diseases, the conscript is recognized as temporarily unfit [5].

After serving in military service in combat conditions for 3 or 6 months, a number of trigger factors affected the servicemen [27, 29]: stressful situations, constant anxiety, and psycho-emotional and physical stress. Under the influence of trigger factors, the psoriatic process entered an acute stage of progression with the spread of the rash over the skin by more than 30%. This led to the formation of plaque-like widespread vulgar psoriasis of the winter form. In the progressive stage, 27 cases were found, which coincides with the scientific literature data provided by the authors.

During the "doctor-patient" interview, 2 citizens had complaints about:

- pain in the joints, lumbar region;
- pain when moving in the lower extremities, their swelling and soreness and morning stiffness of the fingers of the hands without any apparent reason;

- changes in the nail plate (we found in them a positive symptom of point deepening or a symptom of "thimble" and a pathognomonic symptom of "oil stain").

Therefore, psoriatic onychodystrophy can be observed in all clinical variants of psoriasis. Fingernail involvement occurs in 50% of all patients with psoriasis. Toenail involvement occurs in 35% of patients. Nail involvement in psoriasis includes pitting, ulceration, onycholysis, subungual hyperkeratosis, oil droplet formation, and nail plate dystrophy. Up to 90% of patients with psoriatic arthropathies may have nail changes. Nail psoriasis is considered a severe manifestation of the disease [26]. Skin involvement was widespread, with skin involvement reaching 80% [27].

That is, psoriatic arthritis is an inflammatory seronegative arthropathy associated with psoriasis, which develops in approximately 30% of patients diagnosed with psoriasis. At the same time, the prevalence of the disease is higher among patients with excess body weight, a history of HIV infection, trauma/biomechanical stress, frequent infections, the presence of human leukocyte antigen B27 (HLA – B27), etc. Psoriatic arthritis (PsA) was suspected in 2 citizens.

It is known that the Recommendations of the Group for Research and Assessment of Psoriasis and PsA (GRAPPA) identified 6 clinical criteria for psoriatic arthritis: spondyloarthritis, psoriatic skin lesions, nail involvement, dactylitis, enthesitis, and peripheral arthritis. At the same time, the most common clinical criterion for psoriatic arthritis is peripheral arthritis, the frequency of which is 40%. While dactylitis is the least common (only 10%). However, in 2021, the updated Recommendations of the Group for Research and Assessment of Psoriasis and PsA (GRAPPA) were presented. They added 2 more criteria for psoriatic arthritis to the 6 criteria – uveitis and ulcerative colitis. Depending on their presence, the authors proposed an approach to the treatment of psoriatic arthritis [29].

To confirm the preliminary diagnosis of psoriatic arthritis, patient 1 was referred for inpatient examination to the hospital. In addition to routine examination, the following were recommended: X-ray of the hands and feet, ultrasound of the joints, biochemical analysis of blood serum and C-reactive protein, consultation with a rheumatologist. As a result of prolonged stress due to being in the combat zone, the health of patients who underwent a military medical commission will be negatively affected for a long time.

In the group of allergic dermatoses (29 cases), as shown in Table 2, allergic contact dermatitis was most often found in the identified patients. According to the patients, it was caused by metals and lubricants when performing military duties during service, as well as simple irritant contact dermatitis. Clinical forms of acute dyshidrotic eczema of the hands and exacerbation of microbial, paratraumatic eczema on the background of chronic venous insufficiency of the lower extremities. Generalized skin rash caused by the use (side effect) of drugs – toxicoallergoderma after repeated administration of drugs for the treatment of fever.

In addition, contact dermatitis is divided into simple or irritant dermatitis by the mechanism of development. Irritant dermatitis accounts for up to 70% of all dermatitis. Allergic contact dermatitis accounts for 30% of contact dermatitis.

The environment and obligate occupational and household factors directly affect the protective properties of the skin [30]. Non-immunogenic causes skin inflammation at the site of contact. In this case, the clinical picture of dermatitis (acute, subacute, chronic) depends on the site of application, exposure, and strength (concentration) of the factor. Most often these were mechanical influences: friction, stamping (with shoes, belts), high temperatures – hot metal, climatic irritants (dampness, low temperature, wind), the juice of the hogweed plant as a cause of photodermatitis. Allergic contact dermatitis occurs in sensitized individuals upon repeated contact with antigens, the mechanism of skin inflammation develops according to type IV allergic reaction.

In conditions of combat operations, when performing functional duties, the etiological factors are a polluted environment, acids, alkalis, metals, lubricants, synthetic adhesives, paints, epoxy resins, toxic combustion products. The detected eczema (9 cases) developed in the area of the hands after exposure to sensitizers and was acute or subacute in nature, which made it impossible to perform combat missions without proper treatment.

Fig. 1. Subacute hand eczema.

Ingestion of drugs (2 cases) caused toxicoderma in the form of widespread erythematous skin lesions and itching after repeated administration. The suspected drugs were: mefenamic acid at a dose of 500 mg orally and an analgesic (the patient did not remember the name). Toxicoderma of a widespread nature requires hospitalization to prevent progression and possible transformation into severe Stevens-Johnson or Lyell syndromes [31]. Military patients are temporarily recognized as unfit for military service for the duration of treatment until recovery.

Fig. 2. Widespread, confluent erythematous rash on the trunk after repeated administration of a drug (analgesic).

Fig. 3. Widespread maculopapular erythematous-edematous rash after repeated intake of mefenamic acid (500 mg) orally for the treatment of a cold (according to the patient).

The problem of atopic dermatitis is relevant in modern clinical practice and has been described by scientific medicine. The number of patients is constantly increasing, which is associated with air pollution, population allergization, decreased breastfeeding and other factors [32]. Atopic dermatitis is a chronic allergic dermatosis with congenital sensitization and the ability to increase the production of general and specific IgE – "true" atopic dermatitis and in the absence of specific IgE – "non-atopic" dermatitis. Atopic dermatitis develops in childhood and is combined with food allergy, allergic

rhinitis, and asthma [33]. In adults, the clinical manifestations of infiltration with lichenification on the background of congestive erythema with a subjective feeling of dryness, tingling and itching predominate. Difficult military living conditions, contact with detergents and a polluted environment in the war zone negatively affect the skin and change the protective properties of the epidermal barrier in both healthy soldiers and those with mild AD. After being in combat conditions, the clinical course of AD in the patient worsened: the area of affected skin increased, skin itching, erythema and lichenification increased, and infectious complications of a fungal and pyogenic nature appeared. For the treatment of AD, drugs are recommended by the unified protocol “Atopic Dermatitis” [34].

The success of the treatment of chronic and acute dermatoses in military personnel is largely related to the provision of medical dermatovenereological care at all stages, considering new requirements [35, 36] for the activities of the medical (military medical) commission.

In connection with the adoption of the WHO ICD-11 and its implementation in the work of doctors and health care institutions in the European Union countries, there was a need to develop it in accordance with the requirements of medical practice in Ukraine, to inform doctors and medical students in order to study medical and pharmaceutical law, to eliminate medical errors in the system of legal relations "doctor-patient-pharmacist-lawyer", as well as forensic and pharmaceutical risks that arise during pharmacotherapy and circulation of medicines of all clinical and pharmacological, classification and legal, nomenclature and legal groups [37-55].

Thus, an analysis of dermatovenereological pathology in military personnel during outpatient clinic visits was conducted.

Conclusions. The current public health implications of the COVID-19, SARS, and influenza pandemics, as well as the complications that physicians have addressed in the management of patients with cardiovascular and pulmonary diseases, have been associated with significant morbidity and mortality, but there are several important dermatological manifestations that emergency medicine clinicians should be aware of, including vasculitis versus direct viral infection, which indicate several types of skin manifestations and may indicate suspicion of COVID-19 in a person, namely: vesicles; distal limb ischemia; urticaria; livedo racemosis; chills; maculopapular rash; petechiae; purpura. The situation with the spread of SARS, influenza and COVID-19 in Ukraine during the 2023-2024 epidemic season shows that 4,715,963 citizens fell ill, which is 38% less than the epidemic threshold. According to the results of sequencing in the National Reference Laboratory, 36 different types of coronaviruses circulate in Ukraine, which are subvariants of the Omicron virus. In terms of the course of the disease, the Omicron strain mainly proceeds as a common respiratory disease and does not cause severe oxygen dependence, but remains dangerous for risk groups, namely for: - people with pathologies, chronic diseases and weakened immunity; - citizens over 60 years of age who are classified as a risk group, vaccination is recommended for them. Dynamics show that the number of patients has increased almost 9 times. Doctors emphasize that a variant of the Omicron strain called "FliRT" has now been detected in the EU countries neighboring Ukraine.

Analysis of the nosological structure of skin and venereal diseases showed that out of 16 groups of skin diseases, the most patients were found in the following 8 groups: fungal diseases: mycoses of the feet, rubrophytia of the hands, onychomycosis; skin diseases of unknown etiology, namely psoriatic disease; allergic dermatoses: allergic and contact dermatitis, eczema, toxicoderma; diseases of the sebaceous glands, seborrhea. pink acne; viral diseases; keratinization disorders; diseases of the sweat glands.

It is worth noting that during outpatient and polyclinic admission (call-up) a number of mobilized citizens had dermatological pathology in remission, mild form, then after staying in the area of combat operations, there was an exacerbation, spread, complication of dermatoses, which required inpatient complex treatment or outpatient treatment in medical and sanitary units and repeated passage of the military medical commission.

Further research is needed on the side effects of medicines that are dispensed in pharmacies without a doctor's prescription, which are used independently by patients during outpatient treatment. Pharmacoeconomic studies of the cost of medicines used during pharmacotherapy of identified dermatovenereological pathologies will help find the most effective and economically viable

substitutes. In connection with the adoption of the WHO ICD-11 and its implementation in the work of doctors and health care institutions, there was a need to compare it with the ICD-10 and update it to meet modern requirements and bring it to the attention of medical students for the study of medical and pharmaceutical law and the elimination of forensic and pharmaceutical risks and medical errors.

Declaration of conflict interest. The authors confirm that they are the authors of this work and have approved it for publication. The authors also certify that the obtained clinical data and research were conducted in compliance with the requirements of moral and ethical principles based on medical and pharmaceutical law, and in the absence of any commercial or financial relationships that could be interpreted as a potential conflict of interest.

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Ethical approval. Ethical clearance was obtained from the administration of the Military medical clinical Hospital of the Western Region (Lviv, Ukraine). Permission statement for conducting the experiments was received from the administration of the Military medical clinical Hospital of the Western Region (Lviv, Ukraine). Before any data collection, the main purpose of the study was clearly explained to each department (concerned personnel).

Data availability statement. The datasets analyzed during the current study are available from the corresponding author on reasonable request.

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