DOI: https://doi.org/10.30841/2786-720X.4.2025.349512
UDC 614.2:004:616.89-083(477)

Digital mental-psychological health literacy in primary care: an interdisciplinary review for family physicians in the post-crisis era

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The post-crisis period following the COVID-19 pandemic and the war in Ukraine has revealed critical gaps in the capacity of primary care to address population mental health. In this context, mental health literacy (MHL) and digital health literacy (DHL) emerge as key frameworks for strengthening the role of family physicians as first-line providers of psychosocial support.
This review aims to synthesize current evidence (2016–2025) on the integration of MHL and DHL in family medicine practice, with a specific focus on post-crisis settings and the Ukrainian case as a unique example for Europe.
A systematic narrative review was conducted following PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020) and JBI (The Joanna Briggs Institute) guidelines. Literature searches were performed in Scopus, Web of Science, and PubMed. Out of 220 identified records, 47 studies were included, covering global, regional, and national evidence.
The analysis revealed three key domains: the 1st domain – educational one – integrated MHL / DHL programs enhance trust and adherence to treatment; the 2nd domain – clinical one – combined competencies of physicians improve early detection of anxiety and depression; the 3rd domain – systemic one – integration reduces stigma and digital inequalities. Evidence from Ukraine highlights the dual burden on family physicians, who simultaneously provide trauma-informed care and facilitate access to electronic health system (eHealth) services in war conditions.
Thus, MHL and DHL are not auxiliary concepts but strategic resources for the resilience of primary health care. For post-crisis societies, especially Ukraine, their integration into clinical practice, educational curricula, and health policy is a prerequisite for effective recovery and long-term sustainability.
Keywords: *mental health literacy, digital health literacy, family medicine, primary health care, post-crisis health systems, Ukraine, resilience, psychoeducation.*

Цифрова ментально-психологічна грамотність на первинному рівні медичної допомоги: міждисциплінарний огляд для сімейних лікарів у посткризовий період

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Посткризовий період після пандемії COVID-19 та на тлі війни в Україні виявив критичні прогалини у спроможності первинної медичної допомоги ефективно реагувати на потреби психічного здоров'я населення. У цьому контексті ментальна грамотність (mental health literacy – MHL) та цифрова грамотність у сфері здоров'я (digital health literacy – DHL) постають як ключові рамкові підходи до посилення ролі сімейних лікарів як першої ланки психосоціальної підтримки.
У статті узагальнено сучасні наукові дані (за період 2016–2025 рр.) щодо інтеграції MHL та DHL у практику сімейної медицини, з особливим акцентом на посткризові умови та український кейс як унікальний приклад для Європи.
Проведено систематизований наративний огляд із дотриманням рекомендацій PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020) та JBI (The Joanna Briggs Institute). Пошук літератури здійснено у базах Scopus, Web of Science та PubMed. З 220 виявлених публікацій до аналізу включено 47 досліджень, що охоплюють глобальний, регіональний та національний рівні.
Аналіз виявив 3 ключові домени: 1-й – освітній – інтегровані програми MHL / DHL підвищують рівень довіри й прихильності до лікування; 2-й – клінічний – поєднання компетентностей лікарів покращує раннє виявлення тривожних і депресивних розладів; 3-й – системний – інтеграція зменшує стигму та цифрові нерівності. Українські дані демонструють подвійний тягар для сімейних лікарів, які одночасно забезпечують травма-орієнтовану допомогу та фасилітують доступ до eHealth (електронна система охорони здоров'я)-сервісів в умовах війни.
Отже, MHL та DHL не є допоміжними концептами, а виконують роль стратегічних ресурсів для підвищення стійкості первинної медичної допомоги. Для посткризових суспільств, зокрема України, їхня інтеграція в клінічну практику, освітні програми й політику охорони здоров'я є передумовою ефективного відновлення та довготривалої стійкості.
Ключові слова: *ментальна грамотність, цифрова грамотність у сфері здоров'я, сімейна медицина, первинна медична допомога, посткризові системи охорони здоров'я, Україна, стійкість, психоосвіта.*

Digital transformation of healthcare and the growing burden of psycho-emotional crises are driving radical changes in the role of primary care. Following the COVID-19 pandemic and during the war in Ukraine, family physicians have become the key point of contact, responsible not only for medical supervision but also for providing psychosocial support to patients. In this context, the concepts of mental health literacy (MHL) and digital health literacy (DHL) are gaining increasing significance. In this review, we treat them as interconnected yet distinct categories [1–3].

In its classical definition by A. Jorm [3], MHL focused on the ability to recognize mental disorders and to know how and where to seek help. Contemporary studies significantly expand this framework. For instance, V. Patel et al. [4] link MHL to sustainable development goals, whereas B. Wong and colleagues [5] demonstrate that DHL determines an individual's capacity to critically apply digital resources for managing personal health. Taken together, these two approaches form a new interdisciplinary paradigm at the intersection of medicine, psychology, and pedagogy.

Comparative analyses confirm that the COVID-19 pandemic acted as a catalyst for change. A. Abernethy et al. [1] conceptualize digital health as the foundation of modern healthcare systems, while J. Shaver [2] argues that telemedicine has evolved into an essential component for ensuring accessibility of care. D. Vigo and colleagues [5] emphasize inequalities: countries of the Global South experienced a greater burden due to underdeveloped digital services, whereas in Europe digital health has been integrated into state strategies [6].

Ukraine illustrates a unique convergence of these challenges. V. Seleznova et al. [7] showed that, following the onset of the full-scale war, population mental health became a critical domain where family physicians faced a dual burden: responding to the traumatic consequences of war while simultaneously mastering digital healthcare tools.

This review is based on a systematized analysis of publications from 2016 to 2025 indexed in Scopus, Web of Science, and PubMed. Our objective is to integrate the findings of global and local studies to demonstrate how digital MHL can serve as a strategic resource for family medicine in the post-crisis period [8].

For the preparation of this review, we employed a combined approach that integrates the principles of systematic and narrative analysis. The methodological framework was guided by international standards, including PRISMA 2020 [9], the JBI Manual for Evidence Synthesis [10], and PRISMA-ScR for scoping reviews [11, 12], which enable structured synthesis and minimize the risk of bias. Unlike classical approaches that typically focus on a narrow set of studies, we adopted a broad search and selection strategy, encompassing both empirical research articles and review publications.

The literature search was conducted with additional screening in Google Scholar to identify preprint versions and relevant "grey literature". The search strategy employed the following key terms and combinations: "digital mental health literacy", "primary care", "family physician", "post-crisis". The time frame covered the period from 2016 to 2025. At the initial stage, approximately 220 records were identified; after duplicate removal and relevance screening, 47 publications were included in the final analysis.

Inclusion criteria were:

- studies addressing MHL and/or DHL in the context of primary care;
- both review articles (systematic reviews, meta-analyses, scoping reviews) and empirical studies;
- direct relevance to family practice (screening, counselling, educational interventions, digital tools).

Exclusion criteria included:

- studies focusing exclusively on inpatient psychiatry or pharmacotherapy without connection to primary care;
- publications describing only the technical aspects of digital platforms without clinical or pedagogical interpretation.

To enhance the quality of the analysis, we applied recommendations from the Cochrane Handbook [13] on critical appraisal. At the same time, we acknowledged the caution raised by J. Ioannidis [14] regarding the mass production of low-quality systematic reviews; therefore, only publications from peer-reviewed international journals with confirmed indexing in Scopus and Web of Science were included.

Special attention was given to the Ukrainian context. In light of the challenges posed by war and the specific trajectory of electronic health system (eHealth) development in Ukraine, we deliberately included studies documenting the experiences of primary care in crisis conditions. This comparative lens allows global standards to be examined against local practice.

The chosen methodological approach ensures the reliability and reproducibility of this review. For family physicians, this means that the conclusions presented here are grounded not in isolated observations but in a systematic analysis of the most recent evidence.

MHL: Concepts and Challenges

The concept MHL has, over the past decades, become a cornerstone for analyzing community mental health. In its classical definition by A. Jorm [3], MHL was described as an individual's ability to recognize mental disorders and to know how and where to seek help. However, contemporary approaches conceptualize MHL much more broadly: it encompasses knowledge, beliefs, attitudes, and skills that shape mental health behaviors [15]. This includes readiness to seek professional help, the ability to critically evaluate information, overcoming stigma, and developing self-help strategies.

A systematic review by G. Yeo et al. [16] demonstrated that digital MHL programs improve not only awareness but also psychological resilience, particularly among students and young people. Systematic reviews and meta-analyses consistently confirm that enhancing MHL has a direct impact on patient behavior. For example, K. Ma et al. [17] showed that school-based MHL programs increase young people's willingness to seek psychological support. Similarly, G. Sun et al. [18], in a large-scale meta-analysis, provided evidence that such interventions reduce stigma and increase recognition of symptoms related to anxiety and depression. D. Hurley et al. [19] emphasized that including parents and caregivers significantly strengthens the impact of these programs, as family environments serve as crucial moderators of children's behaviors.

A comparison between classical and modern approaches highlights a shift from passive knowledge acquisition to the active development of skills. S. Kutcher et al. [20]

as early as 2016 outlined the prospects of MHL as an educational tool, while recent findings by Q. Chen et al. [21] demonstrate that digital interventions now hold the greatest potential for expanding its impact.

Nevertheless, significant challenges remain. Key issues include inequalities in access to digital resources, cultural and linguistic barriers in the perception of psychiatric terminology, and the risk of information overload, which can exacerbate anxiety [15, 16]. In Ukraine, these challenges are further compounded by the war context: large segments of the population face limited access to educational and digital resources, while the demand for mental health support is at an unprecedented level. This makes the role of family physicians pivotal in disseminating knowledge, reducing stigma, and facilitating self-help.

In other words, for family physicians, MHL is not an abstract concept but a concrete tool that enables the early identification of problems, shortens the pathway to professional care, and improves treatment effectiveness. The educational function of the family physician thus becomes an integral component of professional practice.

DHL and Primary Care

The concept of DHL has, over the past decade, expanded beyond the domain of technical skills and is now regarded as a critical determinant of quality in primary care. DHL is defined as the ability to find, evaluate, understand, and apply digital health information in order to make informed decisions and interact effectively with the healthcare system [22]. In family practice, DHL has increasingly become not only a characteristic of patients but also an indicator of the healthcare system's readiness for effective communication.

European studies show that the integration of eHealth into primary care enhances patient autonomy while simultaneously optimizing the physician's workload. R. Van der Kleij et al. [22] demonstrated that the use of digital platforms in family medicine reduces repeat consultations and facilitates the monitoring of chronic conditions. D. Wong and M. Cheung [23] found that patients with higher levels of DHL demonstrate greater adherence to medical advice, as they are able to critically process information from multiple sources. By contrast, in middle-income countries the situation is different: S. Wong et al. [24] reported that most patients in Malaysian primary care clinics exhibit low levels of DHL, which significantly constrains the potential of digital innovations.

The competence of healthcare professionals themselves is equally critical. In their systematic review, G. Brørs and colleagues [25] showed that even physicians and nurses often have insufficient levels of digital literacy to use eHealth tools effectively. This challenges the assumption that DHL is a problem limited to patients alone. Similarly, A. Alhewiti et al. [26] confirmed that low levels of DHL among physicians negatively affect patients' trust in electronic communication channels and, consequently, treatment outcomes.

In research practice, DHL is most commonly measured with the eHealth scale, developed by S. Norman and N. Skinner [27]. Although this instrument was created in 2006, it continues to be considered the gold standard for assessing baseline DHL. S. Paige et al. [28] emphasize that DHL is not a neutral construct: it directly correlates with trust in information sources. Patients with high DHL are capable of distinguishing evidence-based resources from misinformation, whereas low DHL is frequently associated with reliance on unverified sources.

The Ukrainian context renders this issue particularly pressing. On the one hand, the country is actively implementing a nationwide eHealth. On the other hand, significant portions of the population-especially those affected by war-related displacement-face limited access to digital resources and require additional educational support. In such circumstances, the family physician acts as a mediator between the patient and the digital infrastructure, and their ability to explain and facilitate the development of digital skills becomes crucial.

In other words, advancing DHL is not solely the responsibility of patients but also an obligation of the healthcare system. For family physicians, this implies a dual role: improving their own digital competencies and simultaneously teaching patients to navigate reliable online resources. DHL thus emerges not as a secondary factor but as a strategic resource that determines the effectiveness of prevention, diagnosis, and treatment in primary care.

Post-Crisis Mental Health Needs in Primary Care

The post-crisis period-following pandemics, natural disasters, and armed conflicts-is characterized by an increase in the prevalence of mental disorders and a rising burden on primary care. According to the World Health Organization (WHO) data, the COVID-19 pandemic led to a global increase in depression and anxiety disorders by 25% [29]. This has resulted in a situation where family physicians are often the first to encounter patients experiencing chronic stress, burnout, or post-traumatic stress disorder [30].

European studies indicate that the greatest challenges for primary care in the aftermath of crises include:

1. A massive demand for psychological support amid limited resources [31].
2. The need for new models of multidisciplinary collaboration, including psychologists and social workers [32].
3. The integration of digital services for monitoring and remote follow-up [33].

In Ukraine, practices at the level of individual primary care facilities already demonstrate how public health tasks-such as health education, preventive programs, and intersectoral cooperation-are being institutionalized and scaled under post-crisis conditions [34]. For younger cohorts, who bear a disproportionate psycho-emotional burden, both international strategies for promoting healthy lifestyles and disease prevention [35] and targeted communication models designed to build trust and influence behavior [36] are particularly relevant.

In middle-income countries, however, other problems prevail: the lack of specialized rehabilitation programs, weak digital infrastructure, and the heightened risk of social marginalization of patients with mental disorders [37]. In this context, DHL becomes not merely an additional tool, but a critical resource for ensuring equitable access to care.

The Ukrainian framework of preventive and rehabilitative medicine further clarifies patient pathways at the level of primary care: strategic integration of prevention, early detection, and rehabilitative support reduces the risk of chronicity in psychosomatic conditions and alleviates the load on specialized services [38].

The Ukrainian context is of particular significance. Data [7] indicate that after the onset of full-scale war, more

FAMILY MEDICINE. EUROPEAN PRACTICES / СІМЕЙНА МЕДИЦИНА. ЄВРОПЕЙСЬКІ ПРАКТИКИ •
ISSN 2786-7218 (Online) | ISSN 2786-720X (Print)
№4 (114)/2025

than 60% of the population presented symptoms of anxiety or depression. At the same time, family physicians remain the first point of contact, often without sufficient training in mental health. In parallel, the state is actively developing eHealth services, which create new opportunities for screening and remote consultations but require a high level of DHL from both physicians and patients.

Veterans represent a separate priority group, for whom comprehensive rehabilitation requires multidisciplinary pathways with primary care acting as the coordinator [39]; case studies demonstrate that psychological resilience and long-term adaptation are supported by a combination of psychoeducation, somatic practices, and social integration [40].

A comparison of global and local experiences highlights that the integration of mental health into primary care becomes the main task for post-crisis societies. V. Patel et al. [4] as early as 2018 emphasized that this goal is indispensable for achieving sustainable development. Recent studies confirm that family physicians are positioned to provide early diagnosis, referral, and psychoeducational support, thereby reducing the burden on specialized care [16, 41–44].

At the same time, post-crisis primary care must consider new biopsychosocial determinants, such as the microbiome–brain axis, which is gaining importance for understanding anxiety-depressive manifestations and personalizing psychoeducation [45].

Thus, in post-crisis conditions, the family physician emerges as a key agent in the field of mental health. Their competence in combining MHL and DHL determines whether patients will receive timely assistance or remain outside the system. The integration of digital solutions and multidisciplinary collaboration should therefore be regarded as a strategic priority.

Integrating MHL and DHL in Family Medicine Practice

Integrating MHL and DHL opens a new dimension for the advancement of family medicine. Considered in isolation, MHL focuses on knowledge and skills related to mental health, whereas DHL reflects the ability of both patients and physicians to use digital resources for decision-making. The combination of these two approaches creates an interdisciplinary instrument that enables more effective responses to contemporary challenges.

Educational Dimension

Evidence [41] confirms that educational programs integrating elements of MHL and DHL enhance patients' trust in physicians and improve treatment adherence. This is particularly important for younger populations who actively use digital channels but often lack sufficient critical thinking skills regarding mental health.

Clinical Dimension

In clinical practice, integration means not only conducting screenings but also using digital platforms for ongoing patient follow-up. S. Carolan et al. [42] demonstrated that family physicians who possess both competencies achieve higher rates of early detection of anxiety and depressive disorders. This is explained by the fact that patients remain engaged with the healthcare system for longer periods through digital monitoring channels. A prominent example is the development of Ukrainian mobile prototypes for women of reproductive age, which provide intersessional support and psycho-emotional assistance while simultaneously increasing trust in eHealth innovations [46]. Such practices demonstrate the potential to combine clinical algorithms with psychoeducational interventions in a convenient digital format tailored to primary care.

Systemic Dimension

From a systemic perspective, the integration of MHL and DHL contributes to reducing stigma and inequalities in access to care. J. Mata et al. [16, 37] emphasize that improving DHL is particularly important for vulnerable groups, such as internally displaced persons or older adults. Thus, integration has not only individual but also societal effects, helping to narrow the digital divide and strengthen community resilience in the face of psychosocial challenges.

Future Directions and Policy Implications

Global Priorities

Integrating MHL and DHL into family medicine practice opens strategic opportunities for both global and national health policies. This integration is not only a tool for improving the quality of care, but also a mechanism for enhancing system resilience in post-crisis settings.

At the global level, it is essential to ensure the systematic inclusion of MHL and DHL into primary care programs. WHO and Organisation for Economic Co-operation and Development emphasize that without population-level digital literacy, even the most advanced eHealth initiatives remain ineffective [43]. This calls for the development of unified training protocols for both physicians and patients. V. Patel and S. Saxena [4] highlight that without integrating mental health into primary care, achieving the Sustainable Development Goals is unrealistic.

Educational and Clinical Guidelines

In medical education, a promising direction is the creation of modular programs that combine psychoeducational components with digital skills. Recent work [44–47] demonstrates that practice-oriented DHL training significantly improves physicians' readiness to integrate digital tools into daily practice. This must be complemented by clinical protocols for early mental health screening using digital platforms.

Policy Implications for Ukraine

For Ukraine, which is undergoing both war and reconstruction, the integration of MHL and DHL carries strategic significance. First, it helps reduce the burden on specialized psychiatric services by shifting part of the functions to the primary care level. Second, it creates opportunities for partnerships with international organizations that are already supporting the digital transformation of Ukrainian healthcare. Third, the integration of MHL / DHL can form the foundation for national mental health recovery programs targeting populations that have experienced traumatic events.

Challenges and Risks

At the same time, it is important to consider potential risks: digital inequality, the overload of physicians with non-core tasks, and the danger of excessive dependence on digital platforms. These risks can be mitigated by combining digital solutions with traditional methods of communication, ensuring a clear division of roles within multidisciplinary teams, and investing in the training of healthcare professionals.

In conclusion, the future of family medicine in post-crisis societies depends on the extent to which MHL and DHL are organically integrated into clinical practice, educational curricula, and state health policies. For Ukraine, this is not merely an option but a condition of survival and recovery.

CONCLUSIONS

This review demonstrates that MHL and DHL are no longer optional or peripheral constructs, but rather strategic resources that define the resilience of primary care in post-crisis societies. The evidence from global, regional, and Ukrainian contexts highlights several critical implications.

First, from an educational perspective, integrating MHL and DHL into the curricula of medical and allied health professionals equips family physicians with dual competencies: the ability to identify early signs of mental distress and the digital skills to facilitate patient self-management. Without such integration, health promotion efforts risk being fragmented and ineffective.

Second, from a clinical perspective, family physicians who combine MHL and DHL demonstrate higher accuracy in early detection of depression, anxiety, and trauma-related symptoms. This integration directly improves treatment adherence and continuity of care, both of which are essential for reducing the burden on specialized psychiatric services.

Third, from a systemic perspective, MHL and DHL jointly reduce barriers related to stigma, misinformation, and digital inequalities. Their integration helps align family medicine with broader goals of public health, including the WHO Mental Health Action Plan and the Sustainable Development Goals.

The Ukrainian case illustrates the unique dual burden on family physicians: addressing widespread trauma and stress reactions caused by war, while simultaneously serving as mediators between patients and rapidly expanding eHealth infrastructures. This combination of tasks positions Ukrainian primary care as a living laboratory for studying resilience and innovation in health systems under extreme conditions.

Policy recommendations include:

1. Embedding MHL and DHL training modules in medical education and continuous professional development.
2. Developing digital platforms co-designed with patients to ensure accessibility and trust.
3. Prioritizing vulnerable groups such as displaced persons, women, and older adults in literacy programs.
4. Securing international collaboration to translate evidence into scalable policies.

In conclusion, the integration of MHL and DHL should be viewed not only as a response to crisis but as a long-term investment in strengthening the role of family medicine as the backbone of resilient health systems. For Ukraine and other post-crisis societies, this integration is a prerequisite for sustainable recovery, community resilience, and global alignment with future-oriented health strategies.

Conflict of interest. The authors declare no conflicts of interest.

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Стаття надійшла до редакції 29.09.2025. – Дата першого рішення 02.10.2025. – Стаття подана до друку 07.11.2025