JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S7

From Diagnosis to Social Support: How Laboratory Findings Guide Nursing and Social Specialist Interventions

Najla Hezam Aljameeli[1], Reem Hazam Maharab Aljamily[2], Mansour Alhalw S Alruwaili[3], Horih Alhulw Silham Alruwaili [4], Moshera Khazal Farhan Alrwili[5], Safwan Hamed Abdelkader Abushal[6], Sultan Rashed Alaradi[7], Turki Managal Alrwaily[8], Munefah Mahlel Aldughmany[9], Hatem Meshari Al Harthi[10]

1 Midwife, Maternity And Children Hospital in Hafar Al Batin
2 Nursing Technician, Maternity And Children Hospital in Hafar Al Batin
3 Nursing Technican, Mental Health Hospital
4 Nursing Technician, Maternity And Children Hospital
5 Nursing Technician, Maternity And Children Hospital
6 Social Specialist, Heraa General Hospital
7 Laboratory Specialist ,Maternity and Children's Hospital in Tabuk
8 Nursing Technician, Oncology center
9 Nursing Technician, Erada Mental Health Hospital in Al-Jawf
10 Nursing Technician, alsafa1 phc

Abstract
Nurse researchers have provided conceptual clarity, assessment tools, and empirical investigations about support resources and target populations within the social support literature. A notable deficiency, particularly surprising given nursing's practice-oriented nature, is the conspicuous lack of empirical intervention research. This document proposes prospective areas for nursing research across five tiers of social-support interventions: individual, dyadic, group, social system, and community levels. Nurses can both suggest and validate principles of social support in practical scenarios involving actual populations. They possess the qualifications to offer a distinctive viewpoint on the examination of social support.
Key words: Diagnosis, Social Support, Laboratory, Nursing, Social Specialist

Introduction

Laboratory medicine results significantly impact a substantial number of clinical decisions. Therefore, it is the professional obligation of laboratory medicine specialists to advocate for the optimal utilization of the laboratory (1). Results from laboratory medicine have a big influence on a lot of clinical choices. Therefore, promoting the best possible use of the laboratory is the professional responsibility of laboratory medicine specialists (1). Health experts from all backgrounds engage with patients and caregivers to provide comprehensive services, guaranteeing high-quality care in conventional settings. Our term for this is collaborative healthcare. Laboratory medicine practitioners' responsibilities are expanded by collaborative healthcare.

For many years, the idea of patient-centered healthcare has been accepted. According to a recent opinion piece, patient participation has increased as a result of information and technology revolutions, suggesting that future practice will depend on patient-provider collaboration (2). Online health activities, such as scheduling appointments, placing repeat prescription orders, and accessing medical records, complement the new paradigm. Shared information, shared participation, and shared accountability are the three core ideas that have been put out (3). There is evidence that this approach improves patients' knowledge and ability to control their health

(4). Accountability and duty need to be clarified because personal health records have legal implications.

According to the D study on patients' decision-making about three malignancies, most patients did not meet the requirements for being informed, even though they believed they were well-informed about screening tests. Furthermore, those with lesser incomes and educational attainment showed a reduced ability to understand information. This emphasizes the need for improved patient education, which might be made possible by better patient-centered informatics (5,6), as well as an understanding of the constraints that some people could experience. It is necessary to consider the robustness of these systems, effective data sharing, privacy and security, and the use of data for public health (7).

People from a wide range of backgrounds have developed an interest in social support within the last 10 years. Help from non-professionals rather than experts is the focus of this event. Family, friends, neighbors, coworkers, community leaders, indigenous lay helpers, volunteers, and self-help mutual aid groups are all sources of social support, which encompasses critical, practical, emotional, and educational assistance (8,9) .Clarifying concepts, developing evaluation instruments, and conducting practical study on social support services and the individuals they are intended to assist have all been made possible by nurse researchers(11,12).

Interventions in Social Support and Laboratory Medicine

According to Godlieb, support interventions are "efforts to optimize the psychosocial resources that individuals offer and receive within the context of their relationships with their primary social environment." (13) Differentiate between interventions that broaden networks, change their structure, strengthen existing connections, change the nature of interactions, or link formal and informal systems. Professionals can improve volunteer ties, personal networks, local help, mutual-aid organizations, and community power (14). For several decades, laboratory specialists have generally handled the analytical aspect of investigations. Laboratory medicine (LM) is now highly automated, allowing for the rapid collection of high-quality test findings from a large number of specimens in a range of situations. This technological process is normally performed by highly skilled laboratory staff. However, according to Lundberg, G.D. (15), operations that are not closely overseen by lab workers create the most errors. These include (15) test requests and the actions that must be taken once the test results are acquired. Interventions like Demand Management (DM) and Result Management (RM) can help with this.(16)

Advancements in Laboratory Medicine

Recent advancements in Health Information Technology have fundamentally transformed the practice of laboratory medicine. A technological laboratory, dedicated to addressing the increasing demand for testing, has supplanted a conventional laboratory that merely conducted specified tests to validate or refute the clinician's hypothesis. The latter assesses its success by examining intermediate elements such as the number of tests and expenditures. The model's development has finally attained the status of a "Leading Laboratory" (17). A clinical decision-making model utilizes performance data, including "new diagnosed cases," to assess its usefulness and identify areas for improvement. It might be argued that the Leading Laboratory method is increasingly patient-centric, as its primary objective is to identify previously undetected issues. The general population is believed to receive insufficient diagnoses for conditions such as diabetes (18), primary hyperparathyroidism (19), pancreatitis (20), and chronic renal illness (21). Substantial evidence substantiates this assertion. Contemporary

medical decisions predominantly depend on LM's expertise, leadership, communication skills, utilization of health information technology, collaboration with physicians, and innovative thinking (22).

One recent technical development for HIT (23) are clinical decision support (CDS) tools. A CDS system is any digital tool that supports medical professionals in making clinical decisions. From emergency rooms (EDs), pharmacies, and intensive care units (24, 25), CDS has been helpful in many different healthcare environments and roles. But they have only been really used in laboratories for systems based on computerized provider order entry (CPOE) (26, 27).Apart from helping with diagnosis, labs use CDS systems to reduce money, improve efficiency, enable adherence to clinical guidelines, and protect patients by lowering prescription mistakes.Many of the features of these applications might significantly enhance laboratory examinations. For the same reasons, LM and other disciplines have also made advantage of machine learning and other forms of artificial intelligence (AI). Though (28,29) the biggest difficulty still is how to implement them in regular clinical practice.

Integrating Laboratory Medicine with Clinical Specialties for Improved Patient Outcomes

Clinicians utilizing a laboratory medicine service typically determine the available tests and investigations, thereby benefiting significantly from collaborative healthcare. The repertory is influenced by the individual therapeutic specialties provided and the balance between acute and non-acute clinical care. Hospital physicians require laboratory medicine specialists to collaborate closely with clinical leads in each discipline to optimize service delivery. Collaborating in this manner will facilitate skill enhancement and generate concepts for improving the use of laboratory medicine for patients (30). As part of the triadic collaboration, the clinical laboratory must consider how to deliver services. Enhancing point-of-care testing (POCT) services in emergency departments, intensive care units (ICUs), and clinics can expedite the acquisition of patient data compared to central laboratories. Hospital doctors expect clinical lab data to be very well analyzed when they are sent to them. But they don't always understand how important the pre-analytical phase is as a quality factor, even though they have power over it (31). They probably don't understand that differences in methods can make it harder to use results from different studies or follow national clinical practice standards in their own area. In order to provide better care, laboratory medicine experts should talk to hospital doctors about how important it is to harmonize methods (32) and keep track of samples (33). Senior doctors and nurses in hospitals will know how lab data can be used in their specific areas of practice. However, younger doctors and other health care workers may need help figuring out what the results mean. This help can come in a number of ways, such as comments on how to understand reports, phone calls from the lab, and the ability to talk about results with lab specialists at any time. There is proof that interpretive support speeds up and improves the quality of diagnosis (34). The clinical laboratory and the hospital clinicians who use it should agree on the specifics of interpretive support; this is a core skill (35). The consistency with which this is given needs to be agreed upon (36). Some areas where the lab should take the lead are in managing important results (37).The best way for the clinical laboratory and its hospital users to work together is for them to be able to talk to each other clearly. As part of collaborative healthcare, laboratory medicine specialists should try to be a part of multidisciplinary clinical teams or networks (38). These groups can agree on policies and procedures, look over case studies, agree on how to implement clinical practice guidelines, help with clinical audits of the services offered, and look for chances for growth and research.

Highlighted features of social networks include structural aspects (e.g., circle size, resources), functional aspects (e.g., emotional support, acceptance), enacted support (e.g., reassurance or

advice), and recipient perception of support (37) Support is viewed as an interpersonal exchange between givers and recipients. There are three forms of helpful social interactions: emotional, informational, and instrumental . Emotional support, including verbal and nonverbal care, can relieve distress by boosting self-esteem and allowing for expression of feelings. Informational assistance, which provides guidance and advice, can improve patients' sense of control by minimizing confusion and offering coping methods. Instrumental support provides practical things (e.g., transportation, money, or physical aid) and can reduce emotions of loss of control. The concept of social support might be confusing as it can come from both natural and formal institutions. Natural support systems include family and friends. Individuals can receive official support from mental health and medical professionals, self-help groups, and social or communal links like clubs(38).

During periods of discomfort after encountering a life stressor, the ability to obtain social assistance is often linked to favorable adjustment. Social support has repeatedly demonstrated beneficial effects across diverse populations, including healthy individuals and those recuperating from acute or chronic illnesses, irrespective of ethnicity, religion, sexual orientation, or socioeconomic level (39). Social support comprises two primary facets. The framework of social assistance. This delineates facets of social support concerning the quantity of social ties that individual possesses, the regularity of interactions with that network, and the structure of that network (40). A pivotal study monitoring a cohort of California residents for 9 years has been corroborated by extensive research linking elevated social network levels to favorable physical health outcomes, including longevity, reduced illness, and healthy lifestyle practices (41). Research involving broad populations has demonstrated that elevated levels of structural support are associated with numerous good physical health outcomes. A higher quantity of social connections has been linked to diminished vulnerability to the common cold and reduced mortality (41). The advantages of enhanced social integration are evident in populations with chronic illnesses. Compelling data indicates that structural social support reduces the chance of developing cardiovascular illness (42). This may occur via a stress-buffering process that influences the individual's cardiovascular response to stressors. A laboratory investigation indicated that the presence of a buddy correlated with reduced blood pressure reactivity to a laboratory stressor task (43). Longitudinal studies examining survivors at risk for cardiovascular disease indicate that individuals with greater social integration exhibited reduced arterial calcification experienced fewer strokes , and had lower mortality rates compared to control populations. The impact of structured social support is notably evident among cancer survivors. Breast cancer survivors with increased social network diversity had a reduced incidence of cancer recurrence .Moreover, an increased quantity of social connections has been associated with enhanced immune system performance in ovarian cancer survivors, especially among older persons (42). The beneficial impacts of structural social support on psychological health have also been observed. Increased structural support correlates with protective benefits, whereas diminished structural support, as shown in socially isolated individuals or those facing a loss of social connections, correlates with reduced mental quality of life. (42) reviewed that those with a greater number of social connections were less prone to cognitive impairment with age, experienced less mental anguish in daily life, and exhibited less depressive symptoms. The loss of intimate social connections, such as the death of a spouse, has been linked to heightened levels of despair and diminished overall mental health. The second part of social support pertains to its function, which denotes the quality of the perceived available support. When assessing the quality of assistance offered, one might evaluate many dimensions of functional support: instrumental, emotional, and informational support (43).

Instrumental support refers to the diverse types of practical aid a someone receives in daily life, such as transportation to a medical visit or meal preparation for a patient. Emotional support denotes the intangible assistance that fosters an individual's sense of being valued and enhances their self-esteem. Informational support is the process of obtaining information, assistance, and guidance from others concerning stressors (44). The impression of functional support, rather than its actual quality, is the primary determinant of its impact on physical and mental functioning and overall quality of life., the perception of more available assistance correlates with reduced mortality in healthy persons. In people with chronic illnesses, perceptions of increased support correlate with less functional impairment, reduced pain, and lower mortality rates after heart attacks or an HIV diagnosis. Similarly, breast cancer survivors who recognize a higher availability of functional support experience an extended disease-free interval and reduced mortality rates. Conversely, breast cancer survivors who indicate a lack of access to functional support are more likely to report a deterioration in functional status. In men with prostate cancer, perceptions of inadequate functional assistance correlate with diminished physical quality of life (45). The impact of functional assistance on psychological adjustment parallels that observed in physical adjustment. In a healthy adult demographic, perceptions of increased functional support correlated with elevated emotional well-being (46). Individuals who have recently suffered a heart attack, or received a diagnosis of HIV or cancer, and who reported higher levels of support, were less likely to exhibit depressive symptoms (47).

A scarcity of workforce and mental health issues among nurses have been significant global concerns, especially during the coronavirus disease 2019 (COVID-19) pandemic (48). In China, 49.1% of nursing students expressed a desire to change majors, and 45.4% indicated they would not pursue a career in nursing, potentially worsening nursing workforce shortages (Li et al., 2020). Research has consistently shown that wellbeing significantly influences nurses' decisions to remain in the field. Nursing students encounter heightened stresses beyond those faced by students in several disciplines, including death, workplace violence, adverse perceptions of their professional image, and apprehension of COVID-19 (49). Suboptimal wellbeing correlates with several adverse outcomes, including heightened suicide and self-harm risk, diminished academic achievement, reduced social connectivity, and an elevated likelihood of medical errors. Multiple appeals for prioritizing social support could significantly enhance the wellness of nursing students (49). Perceived social support can positively forecast individual mental health outcomes, such as psychological wellbeing (PWB) and subjective wellbeing (50). Nonetheless, the mechanism by which perceived social support improves mental health remains unclear. Feeney and Collins (2015a) offered an integrated model of social support grounded in attachment theory, indicating that various paths exist via which social support enhances wellbeing. The hypothesis posits that self-evaluation and self-perception pathways correlate with self-compassion and professional self-concept, hence enhancing overall welfare. This study seeks to investigate the role of social support in enhancing psychological well-being through self-evaluation and self-perception mechanisms, thereby offering empirical validation for Feeney and Collins' theoretical framework. Furthermore, it is essential to consider how social support augments psychological well-being through nursing students' self-perceptions, particularly self-compassion and professional self-concept. Perceived social support is defined as the belief that one is cared for by others and possesses a dependable social network available in times of need .It correlated with reduced instances of adverse mental health outcomes (i.e., depression, anxiety, and maladaptive attitudes) (50). Despite the consistent findings, the mechanisms explaining the benefits of social support on mental health, particularly for nursing students, remain unidentified. PWB contrasts with the perspective of subjective well-

being about favorable mental health outcomes. PWB encompasses societal and personal resources that facilitate advancement toward esteemed objectives, alongside the satisfaction of fundamental wants for competence, autonomy, and relatedness, which foster intrinsic motivation and flourishing (51). PWB is regarded as the outcome of a fulfilling life and is a crucial element in students' successful adaptation to college or university life (52). Feeney and Collins established an integrative model of social support, positing that support serves as a catalyst for enhancing wellbeing via self-perceptions. Nevertheless, there has been limited empirical research examining this theoretical paradigm or its specific pathways.

A further category of diagnostics in which CDSS can be advantageous is laboratory testing and interpretation. Notifications and reminders for anomalous laboratory findings are straightforward and prevalent in electronic health record systems. CDSS can enhance the value of laboratory tests to mitigate the necessity for riskier or more intrusive diagnostic procedures(53). Liver biopsies are regarded as the gold standard for diagnosing Hepatitis B and C, although non-invasive laboratory methods lack sufficient accuracy for acceptance. Nonetheless, AI models are being developed that integrate many tests (serum markers, imaging, and genetic assessments) to achieve significantly enhanced accuracy(54). CDSS can also serve as an interpretive tool wherein a test's reference ranges are extensively tailored, taking into account factors such as age, sex, or disease subtypes. Pathology reports are essential decision-making tools for numerous medical professions. Certain Clinical Decision Support Systems (CDSS) can facilitate automated tumor grading. This was conducted for the grading of urinary bladder tumors and the estimation of recurrence, achieving an accuracy of up to 93%. Identical procedures have been implemented for the categorization and grading of brain tumors. Numerous further instances encompass computerized ECG analysis, automated arterial blood gas interpretation, protein electrophoresis reports, and clinical decision support systems for blood cell counting(55).

conclusion

It describes the interdependent relationships among laboratory findings, nursing, and social support in developing health care and health outcomes. Emphasizing the pivotal role laboratory medicine plays in clinical decisions, greater coordination between laboratory specialists and the healthcare team is warranted. Advanced technologies, such as clinical decision support systems and AI, are transforming laboratory efficiency and improving patient care. Social support is investigated over structural and functional dimensions. It proves to be important in aspects of mental and physical health; this is particularly true for vulnerable groups. The paper emphasizes how nursing interventions are needed at levels of social systems and underscores challenges such as workforce shortage and mental health among the nursing staff. It underlines the potential of social support to improve psychological well-being and emphasizes the importance of shared accountability and patient-centeredness in contemporary healthcare practices.

References

(1) Beastall GH. Adding value to laboratory medicine: a professional responsibility. Clin Chem Lab Med 2013;51:221–8.

(2) Millenson ML. When “patient centred” is no longer enough: the challenge of collaborative health: an essay by Michael L Millenson. Br Med J 2017;358:j3048.10.1136/bmj.j3048

(3) Canadian Agency for Drugs and Technology: Rapid Response Report. Personal electronic health records: a review of clinical effectiveness, cost-effectiveness and guidelines. 4 March 2016.

(4) Cushman R, Froomkin AM, Cava A, Abril P, Goodman KW. Ethical, legal and social issues for personal health records and applications. J Biomed Inform 2010;43:551–5.10.1016/j.jbi.2010.05.003

(5) Hoffmann RM, Lewis CL, Pinone MP, Couper MP, Barry MJ, Elmore JG, et al. Decision-making processes for breast, colorectal and prostate cancer screening: the DECISIONS survey. Med Decis Making 2010;30:53S–64S.10.1177/0272989X10378701

(6) Sepucha KR, Fagerlin A, Couper MP, Levin CA, Singer E, Zikmund-Fisher BJ. How does feeling informed relate to being informed? The DECISIONS survey. Med Decis Making 2010;30:77S–84S.10.1177/0272989X10379647

(7) Meslin EM, Alpert SA, Carroll AE, Odell JD, Tierney WM, Schwartz PH. Giving patients granular control of personal health information: using an ethics 'Points to Consider" to inform informatics system designers. J Med Inform 2013;82:1136–43.10.1016/j.ijmedinf.2013.08.010

(8) House, J. (1981). Work Stress und Social Support. Prentice-Hall, Englewood Cliffs, New Jersey.

(9) House, J. and Kahn, R. L. (1985). Measures and concepts of social support. In Social Support and Heahh. S. Cohen and S. Syme (Eds). pp. 83-108. Academic Press, Orlando.

(10) Tardy, C. H. (1985). Social support measurement. Am. J. Community Psycho/. 13, 187-202.

(11) Pearlin, L. I. (1985). Social structure and processes of social support. In Social Support and Health. S. Cohen and S. L. Syme (Eds). pp. 43-60. Academic Press, Orlando.

(12) Wills, T. A. (1985). Supportive functions of interpersonal relationships. In Social Support and Health. S. Cohen & S. L. Syme (Eds). pp. 61-82. Academic Press, Orlando.

(13) Chapman, N. J. and Pancoast. D. L. (1985). Working with the informal helping networks of the elderly: the experiences of three programs. J. Social Issues 41, 47-63.

(14) Froland, C. (1981). Helping Networks and Human Services. Sage, Beverly Hills

(15) Lundberg G.D. Acting on significant laboratory results. JAMA: J Am Med Assoc. 1981;245(17):1762. doi: 10.1001/jama.1981.03310420052033.

(16) Stroobants A.K., Goldschmidt H.M.J., Plebani M. Error budget calculations in laboratory medicine: Linking the concepts of biological variation and allowable medical errors. Clin Chim Acta. 2003 15;333(2):169–176. doi: 10.1016/s0009-8981(03)00181-5.

(17) Salinas M., López-Garrigós M., Flores E., Martín E., Leiva-Salinas C. The clinical laboratory: a decision maker hub. Clin Chem Lab Med (CCLM) 2021 27;59(10):1634–1641. doi: 10.1515/cclm-2021-0421.

(18) American Diabetes Association Professional Practice Committee. 2 Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2022. Diabetes Care. 2022 1;45(Suppl 1):S17–S38. doi: 10.2337/dc22-S002.

(19) Marcocci C., Cetani F. Primary hyperparathyroidism. N Engl J Med. 2011;365(25):2389–2397. doi: 10.1056/NEJMcp1106636.

(20) Salinas M., Flores E., López-Garrigós M., Díaz E., Esteban P., Leiva-Salinas C. Application of a continual improvement approach to selecting diagnostic markers for acute pancreatitis in an emergency department. Emergencias. 2017;Abr 29(2):113–116.

(21) García-Maset R., Bover J., Segura de la Morena J., Goicoechea Diezhandino M., Cebollada del Hoyo J. Escalada San Martín J, et al. Documento de información y consenso para la detección y manejo de la enfermedad renal crónica. Nefrología. 2022;42(3):233–264. doi: 10.1016/j.nefroe.2022.07.003.

(22) Olver P., Bohn M.K., Adeli K. Central role of laboratory medicine in public health and patient care. Clin Chem Lab Med (CCLM) 2023;61(4):666–673. doi: 10.1515/cclm-2022-1075.

(23) Beeler P.E., Bates D.W., Hug B.L. Vol. 144. Swiss Med Wkly; 2014. (Clinical decision support systems). w14073.

(24) Patterson B.W., Pulia M.S., Ravi S., Hoonakker P.L.T., Schoofs Hundt A., Wiegmann D., et al. Scope and influence of electronic health record–integrated clinical decision support in the emergency department: a systematic review. Ann Emerg Med. 2019;74(2):285–296. doi: 10.1016/j.annemergmed.2018.10.034.

(25) Sutton R.T., Pincock D., Baumgart D.C., Sadowski D.C., Fedorak R.N., Kroeker K.I. Vol. 3. NPJ Digit Med.; 2020. (An overview of clinical decision support systems: benefits, risks, and strategies for success.).

(26) Noorbakhsh-Sabet N., Zand R., Zhang Y., Abedi V. Artificial intelligence transforms the future of health care. Am J Med. 2019;132(7):795–801. doi: 10.1016/j.amjmed.2019.01.017.

(27) Sankaranarayanan S., Balan J., Walsh J.R., Wu Y., Minnich S., Piazza A., et al. COVID-19 mortality prediction from deep learning in a large multistate electronic health record and laboratory information system data set: algorithm development and validation. J Med Internet Res. 2021;23(9) doi: 10.2196/30157.

(28) Cadamuro J. Rise of the machines: The inevitable evolution of medicine and medical laboratories intertwining with artificial intelligence—a narrative review. Diagnostics (Basel) 2021 2;11(8) doi: 10.3390/diagnostics11081399. 17.Sharpe P.K., Caleb P. Artificial neural networks within medical decision support systems. Scand J Clin Lab Invest. 1994;54(sup219):3–11. doi: 10.3109/00365519409088571.

(29) Price CP, St John A, Christenson RH, Scharnhorst V, Oellerich M, Jones P, et al. Leveraging the real value of laboratory medicine with the value proposition. Clin Chim Acta 2016;462:183–6.10.1016/j.cca.2016.09.006

(30) Cornes MP, Church S, van Dongen-Lases E, Grankvist K, Guimares JT, Ibarz M, et al. The role of the European Federation of Clinical Chemistry and Laboratory Medicine Working Group for Pre-analytical phase in standardization and harmonization of the pre-analytical phase in Europe. Ann Clin Biochem 2016;53:539–47.10.1177/0004563216643969

(31) Plebani M. Harmonization in laboratory medicine: the complete picture. Clin Chem Lab Med 2013;51:741–51.10.1515/cclm-2013-0075Search in Google ScholarPubMed

(32) Beastall GH, Brouwer N, Quiroga S, Myers GL. Traceability in laboratory medicine: a global driver for accurate results for patient care. Clin Chem Lab Med 2017;55:1100–8.10.1515/cclm-2017-0060

(33) Laposata ME, Laposata M, Van Cott EM, Buchner DS, Kashalo MS, Dighe AS. Physician survey of a laboratory medicine interpretive service and evaluation of the influence of interpretations on laboratory test ordering. Arch Pathol Lab Med 2004;128:1424–7.10.5858/2004-128-1424-PSOALM

(34) Kratz A, Laposata M. Enhanced clinical consulting – moving toward the core competencies of laboratory professionals. Clin Chim Acta 2002;319:117–25.10.1016/S0009-8981(02)00032-3

(35) Plebani M. Interpretative commenting: a tool for improving the laboratory-clinical interface. Clin Chim Acta 2009;404:46–51.10.1016/j.cca.2009.03.01238. Piva E, Sciacovelli L, Pelloso M, Plebani M. Performance specifications of critical results management. Clin Biochem 2017;50:617–21.10.1016/j.clinbiochem.2017.05.010

(36) Ruhstaller T, Roe H, Thürlimann B, Nicholl JJ. The multidisciplinary meeting: an indispensable aid to communication between different specialities. Eur J Cancer 2006;42:2459–62.10.1016/j.ejca.2006.03.034

(37) Cohen, S. (1988). Psychosocial models of the role of social support in the etiology of physical disease. Health Psychology, 7, 269 – 297

(38) Hogan, B. E., Linden, W., & Najarian, B. (2002). Social support interventions: do they work?. *Clinical psychology review*, *22*(3), 381-440.

(39) Wills, T. A., & Fegan, M. F. (2001). Social networks and social support. In A. Baum, T. A. Revenson, & J. E. Singer (Eds.), *Health psychology* (pp. 209–234). Mahwah, NJ: Lawrence Erlbaum.

(40) Friedman, H. S., & Silver, R. C. (2007). *Foundations of health psychology*. New York: Oxford University Press.

(41) Cohen, S., & Janicki-Deverts, D. (2009). Can we improve our physical health by altering our social networks? *Perspectives on Psychological Science, 4*, 375–378.

(42) Uchino, B. N. (2004). *Social support and physical health: Understanding the health consequences of relationships*. New Haven, CT: Yale University Press

(43) Kamarck, T. W., Manuck, S. B., & Jennings, J. R. (1990). Social support reduces cardiovascular reactivity to psychological challenge: A laboratory model. *Psychosomatic Medicine, 52*, 42–58.

(44) Friedman, H. S., & Silver, R. C. (2007). *Foundations of health psychology*. New York: Oxford University Press.

(45) House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. Science, 241, 540–545.

(46) Antonucci, T. C., & Akiyama, H. (1987). An examination of sex differences in social support among older men and women. Sex Roles, 17(11), 737–749.

(47) Manne, S. L., Winkel, G., Ostroff, J., Grana, G., & Fox, K. (2005). Partner unsupportive responses, avoidant coping, and distress among women with early stage breast cancer: Patient and partner perspectives. Health Psychology, 24(6), 635–641.

(48) Lynch, J., Evans, N., Ice, E., and Costa, D. K. (2021). Ignoring nurses: media coverage during the COVID-19 pandemic. Ann. Am. Thorac. Soc. 18, 1278–1282. doi: 10.1513/AnnalsATS.202010-1293PS

(49) Li, Y., Wang, Y., Jiang, J., Valdimarsdóttir, U. A., Fall, K., Fang, F., et al. (2020). Psychological distress among health professional students during the COVID-19 outbreak. Psychol. Med. 51, 1952–1954.

(50) Melnyk, B. M., Orsolini, L., Tan, A., Arslanian-Engoren, C., Melkus, G. D. E., Dunbar-Jacob, J., et al. (2018). A national study links nurses' physical and mental health to medical errors and perceived worksite wellness. J. Occup. Environ. Med. 60, 126–131. doi: 10.1097/JOM.0000000000001198

(51) Taylor, S. E. (2011). Social Support: A Review. Oxford: Oxford University Press.

(52) Feeney, B. C., and Collins, N. L. (2015a). A new look at social support: A theoretical perspective on thriving through relationships. Pers. Soc. Psychol. Rev. 19, 113–147. doi: 10.1177/1088868314544222

(53) Berner E. *Clinical Decision Support Systems: Theory and Practice* 3rd edn. https://doi.org/10.1007/978-0-387-38319-4 (2016).

(54) Spyridonos, P., Cavouras, D., Ravazoula, P. & Nikiforidis, G. A computer-based diagnostic and prognostic system for assessing urinary bladder tumour grade and predicting cancer recurrence. *Med. Inf. Internet Med.* **27**, 111–122 (2002).Return to ref 72 in article

(55) Tsolaki, E. et al. Fast spectroscopic multiple analysis (FASMA) for brain tumor classification: a clinical decision support system utilizing multi-parametric 3T MR data. *Int. J. Comput. Assist Radio. Surg.* **10**, 1149–1166 (2015).