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การตรวจสุขภาพก่อนเข้าทำงาน: หลักฐานเชิงประจักษ์และนัยต่อการปฏิบัติในประเทศไทย

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Pre-employment Health Examinations: Evidence and Implications for Practice in Thailand

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บทคัดย่อ

ภูมิหลังและวัตถุประสงค์: การตรวจสุขภาพก่อนการจ้างงาน (pre-employment health examinations) ถูกนำมาใช้กันอย่างแพร่หลายเพื่อประเมินความพร้อมของผู้สมัครงานในการปฏิบัติงานตามลักษณะงานที่กำหนด อย่างไรก็ตาม ประสิทธิภาพของการตรวจดังกล่าวในการป้องกันผลกระทบจากการการทำงานต่อสุขภาพผู้รับบริการ ยังคงมีความไม่แน่ชัด ดังนั้นการศึกษาครั้งนี้จึงมีวัตถุประสงค์เพื่อสังเคราะห์หลักฐานวิชาการที่มีอยู่เกี่ยวกับการประเมินสุขภาพก่อนการจ้างงานและก่อนเข้าปฏิบัติงาน (pre-employment และ pre-placement assessments) รวมทั้งอภิปรายถึงนัยสำคัญต่อการดำเนินงานด้านอาชีวอนามัยในประเทศไทย

วิธีการศึกษา: เป็นการทบทวนเชิงพรรณนา (narrative review) โดยสืบค้นข้อมูลจากฐานข้อมูล PubMed และ Scopus ครอบคลุมงานวิจัยที่เกี่ยวข้องกับ pre-employment และ pre-placement examinations โดยคัดเลือกงานวิจัยที่ศึกษา effectiveness, predictive value และผลกระทบด้านอาชีวอนามัย จากนั้นทำการสังเคราะห์เชิงเนื้อหาตามประเด็นสำคัญ

ผลการศึกษา: พบว่าปัจจุบันยังมีหลักฐานไม่เพียงพอที่จะสนับสนุนประเด็นการตรวจสุขภาพก่อนการจ้างงานแบบทั่วไปทั้งในแง่การป้องกันโรคจากการทำงานและการลาป่วย อย่างไรก็ตามมีหลักฐานทางวิชาการสนับสนุนว่าการตรวจสุขภาพตามปัจจัยเสี่ยงเฉพาะจะเป็นการเหมาะสมมากกว่า

สรุป: การตรวจสุขภาพก่อนเข้าทำงานควรมุ่งเน้นตามความเสี่ยงของงานมากกว่าการใช้แบบทั่วไป ในบริบทของประเทศไทยพบช่องว่างระหว่างนโยบายและการปฏิบัติจริง จำเป็นต้องมีการวิจัยเพิ่มเติมเพื่อสนับสนุนแนวทางที่อิงหลักฐานเชิงประจักษ์

คำสำคัญ: อาชีวอนามัย, การบาดเจ็บจากการทำงาน, การจ้างงาน, การดูแลสุขภาพเชิงป้องกัน, การคัดกรองการใช้สารเสพติด

Abstract

Background and objective: Pre-employment health examinations are widely used, however, their effectiveness in preventing adverse occupational health outcomes remains in question. Therefore, this study aimed to examine the evidence on the effectiveness of pre-employment and pre-placement assessments and to consider their implications for practice, with particular reference to Thailand.

Methods: This study is a narrative review synthesizing evidence from studies identified through database searches (PubMed and Scopus), focusing on effectiveness, predictive value, and implications of pre-employment and pre-placement assessments.

Results: Overall, current evidence is insufficient to support a routine pre-employment examination in reducing occupational injury, illness, or sickness absence. Some evidence suggests that assessments focused on specific job risks may be more appropriate.

Conclusions: A targeted, risk-based approach is more appropriate than routine screening. In Thailand, a gap exists between policy and practice. Further research is required to support evidence-based occupational health policies.

Keywords: occupational health, occupational injuries, employment, preventive health care, drug abuse screening

Introduction

In clinical practice, occupational health checkups for workers are commonly performed and aim at early disease detection and improving health outcomes. There are several opportunities for workers to undergo health checks, such as annual general health checks, annual fitness-for-work examinations, and pre-employment examinations. Therefore, workers' medical examinations consist of both general health and occupational (job-specific) examinations. A systematic review has revealed that general health checks could improve the detection and management of diseases (e.g., hypertension), risk control (e.g., blood pressure control), and clinical preventive services uptake (e.g., cancer screening) [1]. However, they did not significantly reduce overall mortality or cardiovascular events. As a result, routine health checks should be performed in a reasonable manner and be evidence-based.

For occupational-specific examinations, similar principles underpin the use of screening in occupational settings. Essentially, pre-employment (prior to a job offer) and pre-placement (after a job offer) examinations are intended to determine whether a job applicant can perform the specific tasks without risk to their own health or the safety of others. In other words, the primary aim of pre-employment or pre-placement examinations is to assess and match workers' capacity to their job demands and identify the need for job accommodation [2]. At the same time, they can also establish baseline health information for future occupational health surveillance.

In this review, we will consistently use the term "pre-employment examinations" to refer to both pre-employment and pre-placement examinations. In Thai practice, however, pre-employment assessment is commonly implemented as a general health check that sometimes, but not necessarily, includes laboratory investigations or imaging, which may not be related to occupational risks (e.g., HIV testing in clerical workers). Accordingly, the importance of routine pre-employment examinations for all job

applicants in preventing adverse job-related outcomes remains unclear (a knowledge gap). Therefore, we aim to narratively review the evidence on the effectiveness of pre-employment examinations and their implications in Thailand.

Methods

This narrative review was conducted to summarize the existing evidence on pre-employment health examinations. A literature search was performed using electronic databases, including PubMed and Scopus, for studies published up to December 2024.

The screening process was conducted in sequential stages: (1) identification of records using predefined search terms, (2) title and abstract screening to exclude irrelevant studies, and (3) full-text assessment using explicit inclusion and exclusion criteria. Studies were included if they evaluated the effectiveness, predictive value, or implications of pre-employment or pre-placement health assessments in occupational settings. Eligible designs included systematic reviews, randomized controlled trials, and observational studies. Studies published in languages other than English or lacking sufficient methodological clarity were excluded.

The included studies were organized into thematic domains to facilitate structured synthesis. These domains included: effectiveness of pre-employment examinations, predictive value of screening tools, pre-employment drug screening, and ethical and economic considerations. Findings are presented according to these thematic categories.

A total of 21 articles were identified through database searches (PubMed and Scopus). After removal of duplicates and initial title and abstract screening, 15 articles were retained for full-text review. Of these, 12 studies met the inclusion criteria and were included in the final synthesis based on relevance to pre-employment health examinations and adequate methodological quality [1-12].

Results

Effectiveness of pre-employment health examinations

A systematic review of the effectiveness of pre-employment examinations across seven studies involving more than 7,800 participants found mixed results but suggested that any potential benefit tends to be associated with job-specific pre-employment examinations rather than general examinations [2]. Similarly, evidence from a randomized controlled trial showed that a general pre-employment examination for light-duty work (the control group) did not significantly reduce sickness absence at twelve months after employment (mean difference -0.09 days; 95% confidence interval [CI] -0.47 to 0.29) [3]. However, some studies found that job-specific assessments might reduce musculoskeletal injuries. Importantly, most identified studies reported higher rates of applicant rejection related to pre-employment examinations, ranging from 2% to 35%. This implies that pre-employment examinations may result in increased exclusion from employment.

From a critical appraisal perspective, the overall quality of evidence is moderate. Although systematic reviews provide a higher level of evidence, they are constrained by heterogeneity in study populations, interventions, and outcomes. The limited number of randomized controlled trials and inconsistent findings reduce confidence in the effectiveness of routine screening.

In conclusion, current evidence does not support routine general pre-employment examinations in reducing occupational injury, illness, or sickness absence. Limited benefits may exist for targeted, job-specific assessments, particularly in higher-risk occupations.

Predictive value of pre-employment screening tools

Another systematic review of nine studies examined the predictive performance of pre-employment health questionnaires for work-related outcomes,

including respiratory symptoms, back pain, sickness absence and ill-health retirement [4]. Overall, questionnaire-based screening demonstrated weak associations with subsequent adverse occupational health outcomes. For example, a reported history of wheeze among workers exposed to grain dust had a positive predictive value of less than 50% for respiratory symptoms [5]. Additionally, in workers exposed to respiratory irritants and sensitizers, smoking status was the only factor associated with subsequent wheeze [6].

These findings highlight important limitations in relying solely on self-reported health data. Many studies included in this area are observational and subject to recall bias and misclassification. Additionally, variability in questionnaire design and outcome definitions further reduces comparability across studies. In conclusion, pre-employment screening (especially when solely using questionnaires) has limited predictive value for future occupational health outcomes and should not be used as standalone tools for risk assessment.

Pre-employment drug screening

Pre-employment drug screening is also common worldwide [7], including in Thailand; however, its effectiveness is still debatable. A systematic review of 23 studies published between 1990 and 2013 found that the majority reported no significant benefit of pre-employment drug screening for workplace safety [8]. Similarly, a systematic review of drug screening in healthcare workers reported positive urine test results from 0.25% to 12% but no clear link between positive results and job performance was demonstrated [9]. Also, initial positive results may not truly reflect illicit substance use and usually need a confirmatory evaluation. However, a prospective cohort study of over 2,500 postal workers in the United States found that employees who screened positive for marijuana or cocaine had a significantly higher risk of subsequent injuries (relative risk 1.85 for both) [10].

From a methodological standpoint, the evidence is heterogeneous and often limited by differences in study design, testing methods, and outcome measures. False-positive results and the need for confirmatory testing also complicate interpretation and reduce reliability. In conclusion, evidence supporting pre-employment drug screening as an effective workplace safety strategy is inconsistent. While some associations exist, overall benefits remain unclear.

Ethical and economic considerations

The limited evidence supporting routine pre-employment health examinations raises important ethical and economic concerns. Firstly, when examinations are perceived as a process to exclude job applicants rather than to identify opportunities for reasonable job accommodation, they may cause indirect discrimination against individuals with chronic illness or disability despite unclear benefits [2]. Secondly, many assessments or investigations can result in false-positive results, possibly leading to unjustified rejections, employment delays, as well as unnecessary follow-up [7].

These may impose avoidable financial costs and wider economic consequences for both affected individuals and related organisations. Furthermore, in cases where applicants must pay for examinations themselves, such practices may partly exacerbate inequalities in access to employment. At present, the widespread use of pre-employment screening among low-risk populations may thereby represent low-value care, incurring costs without definite evidence of improved occupational health or safety outcomes. From a critical appraisal perspective, the overall evidence in this area is primarily based on conceptual analyses and observational data rather than experimental studies. While these sources provide important insights, they may lack quantitative precision and are context dependent. In conclusion, routine pre-employment examinations may pose ethical and economic challenges, including potential

discrimination, unnecessary costs, and inequitable access to employment, particularly in low-risk populations.

Evidence from Thailand context

Pre-employment health examinations are commonly required in both the public and private sectors in Thailand. However, there is no general legal requirement for routine medical assessment of all job applicants. Current regulations instead emphasise health evaluation for workers who will be exposed to specific occupational hazards. Under the Ministerial Regulation on health examinations for employees exposed to occupational risk factors B.E. 2563 (A.D. 2020) [11], employers are required to arrange appropriate pre-placement assessments based on the manner of occupational exposure, to be performed before starting work or within 30 days of employment. Notably, examinations must be performed by a qualified physician with occupational health competence such as board-certified occupational medicine physicians or licensed physicians who completed a fundamental occupational medicine training.

Nevertheless, many organisations require general pre-employment screening for all applicants regardless of job risk. Consequently, there remains a gap between regulatory intent and actual practices as administrative requirements, organisational risk concerns, and the cultural acceptance of preventive health screening may sustain routine pre-employment screening despite insufficient evidence on its benefits. Local evidence also suggests that the yield of pre-placement examinations may be limited, particularly in low-risk occupations. A cross-sectional study of 336 employees undergoing pre-placement assessment in Thailand found that 83.9% were classified as fit for work, while 10.4% required work restrictions and only 5.7% were considered unfit [12]. Most cases of being unfit to work or restricted occurred in safety-sensitive roles, such as drivers, workers at height, and confined-space workers.

In contrast, among employees assigned to other jobs without specific risk exposures, almost all (97%) were found to be fit for work.

From a critical appraisal perspective, this evidence is based on a single cross-sectional study and may not be generalizable. Additionally, the study design does not allow for causal inference or evaluation of long-term outcomes. In conclusion, Thai evidence supports a targeted, risk-based approach, as routine screening in low-risk populations yields minimal benefit. However, further high-quality research is needed to inform national practice.

Discussion

This review demonstrates that the overall effectiveness of routine pre-employment health examinations remains uncertain. Across multiple studies, including systematic reviews and randomized controlled trials, there is consistent evidence that general, non-specific screening provides minimal benefit in reducing occupational injury, illness, or sickness absence. In contrast, several studies suggest that targeted, job-specific assessments may offer modest benefits, particularly in high-risk occupations such as those involving physical strain or hazardous exposures.

Importantly, the magnitude of these benefits appears to be limited and context-dependent. For example, while some observational studies report reductions in musculoskeletal injuries following job-specific assessments, these findings are not consistently replicated across settings. Furthermore, evidence from randomized trials indicates negligible differences in sickness absence, suggesting that routine screening may not meaningfully impact workforce health outcomes.

The predictive value of pre-employment screening tools, particularly questionnaires, is generally low. Evidence from multiple studies indicates weak associations between pre-employment health indicators and subsequent occupational outcomes.

This limitation is compounded by methodological issues such as recall bias, variability in measurement tools, and inconsistent outcome definitions. As a result, reliance on such tools for decision-making may lead to misclassification and inappropriate exclusion of applicants.

Similarly, the evidence on pre-employment drug screening is mixed. While some cohort studies demonstrate associations between positive drug tests and increased injury risk, systematic reviews largely report no significant improvement in workplace safety outcomes. Variability in testing methods, false-positive results, and lack of clear linkage to job performance further limit the utility of such screening programs.

From an ethical and economic perspective, routine pre-employment examinations raise significant concerns. Several studies highlight the potential for indirect discrimination, particularly against individuals with chronic conditions or disabilities, without clear evidence of benefit. Additionally, false-positive findings and unnecessary investigations may lead to increased costs, employment delays, and inequitable access to job opportunities. These concerns are particularly relevant in low-risk populations, where the likelihood of benefit is minimal.

In the Thai context, the findings of this review align with existing local evidence, which suggests that routine screening yields limited benefit in low-risk occupations. Despite regulatory emphasis on risk-based assessments, routine general screening remains common in practice. This discrepancy likely reflects administrative practices, organizational risk management concerns, and cultural acceptance of health screening, rather than evidence-based policy implementation. Overall, this review highlights a critical need to shift from routine, generalized screening toward targeted, evidence-based approaches that align worker health assessments with specific job demands and risks.

Conclusions

Current evidence remains insufficient to support the routine use of general pre-employment screening to prevent occupational injury, illness or sickness absence; however, limited evidence suggests that targeted, job-specific assessments may provide benefit in high-risk settings. In addition, some unnecessary tests may raise concerns about discrimination or ethical issues. Pre-employment examinations should therefore focus on their primary purpose, that is, matching workers' capacities to their job demands, ensuring safe job placement and identifying the need for appropriate job restrictions or accommodations.

In Thailand, there is a clear mismatch between policy and practice. While regulations support risk-based assessments, routine screening remains common due to administrative and cultural factors. As this is a narrative review, it is subject to potential selection bias and the heterogeneity of included studies. Therefore, this study suggests that employers should require pre-employment examinations based on risk, rather than general examinations in all applicants to avoid the problems stated above. Further research is necessary to generate evidence on effectiveness—particularly through high-quality prospective studies—and cost-effectiveness, and to inform clearer, appropriate guidance that supports evidence-based occupational health practice.

Conflicts of interest

None declared.

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