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Review Article

Integrating Dance-Specific Screening Tools and Psychological Assessments for Injury Prevention in Dancers

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Abstract

Introduction: Dance is an art form demanding exceptional physical and psychological performance. Despite growing research on injury risk and prevention, dancers remain highly susceptible to musculoskeletal injuries, particularly in the lower extremities. Traditional screening approaches have emphasized physical risk factors, while the influence of psychological health has been comparatively underexplored. Emerging evidence suggests that integrating physical and psychological assessments may provide a more comprehensive strategy for injury prevention. This review aims to synthesize current evidence on dance-specific physical screening tools and psychological assessments used for injury prevention, evaluate their predictive validity, and propose an integrated biopsychosocial framework for early identification and management of injury risk in dancers.

Methods: A narrative review of recent literature from PubMed, Scopus, and Web of Science was conducted, including studies on screening, psychological assessment, and injury prevention in dance and athletic populations. Priority was given to prospective cohort studies, systematic reviews, and meta-analyses published within the past two decades. Data were synthesized to compare predictive factors, validity, and application of both physical and psychological screening tools.

Results: Dance-specific screening tools - such as dynamic balance, lumbopelvic control, joint range of motion, and functional movement tests - demonstrate moderate predictive validity for lower extremity injury. Psychological tools including the Athletic Coping Skills Inventory, Perceived Stress Scale, Athletic Burnout Questionnaire, and Multidimensional Scale of Perceived Social Support show strong associations between stress, coping, and injury incidence. Integrated models combining these domains enhance predictive accuracy and enable individualized, targeted prevention strategies.

Conclusions: Integrating dance-specific physical and psychological screening represents a promising evolution in dancer health management. This holistic approach identifies at-risk dancers more accurately, supports tailored interventions, and aligns with contemporary biopsychosocial models of injury prevention. Future research should prioritize standardized protocols, longitudinal validation, and interdisciplinary collaboration to optimize implementation and improve dancer well-being and performance longevity.

Keywords: Dance Injury Prevention; Screening Tools; Psychological Assessment; Biopsychological Model; Narrative Review

Introduction

Dancing is a physically demanding activity that requires strength, flexibility, coordination, and endurance. While it offers numerous benefits such as improved physical fitness, emotional expression, and social connection, it also comes with a high risk of injury. Dance-related injuries are common across all ages and dance genres, with the highest incidence in the lower extremities and a predominance of soft tissue and overuse injuries [1-4]. In pediatric populations, emergency department data from the United States show an average of 23, 291 children treated annually for dance-related injuries, with a 68% increase in injury rates over two decades. Girls account for the majority of cases (80%), and adolescents aged 15-19 years represent the largest age group affected. Sprains and strains are the most frequent diagnoses (44-52%), and the lower extremities are the most injured region (56-58%) [5, 6] (Table 1).

Table 1: Epidemiology of Dance Injury.

Epidemiologic Feature	Details	References
Incidence	23,291 pediatric cases/year in US EDs; 68% increase over 21 years; 5.51 injuries/1000 dance hours in pre-professional Chinese dancers	[6,44]
Injury Types	Sprains/strains (44-52%), tendonitis/tendinopathy, patellofemoral pain, apophysitis, stress fractures, joint/ligament injuries, muscle injuries	[1,5,6,8,44,45]
Affected Age Groups	Highest in adolescents (15-19 years: 40-47% of cases); children (3-10 years) more head/neck injuries; young dancers (10-14) lower rates than older youth (15-24)	[5,6,14,44,46]
Body Regions Most Affected	Lower extremities (56–58%): ankle/foot, knee, thigh/leg; head/neck in young children; upper extremity in break dancing	[1,5,6,14,45-47]
Mechanism of Injury	Falls (35-45%), noncontact (32%), dynamic overload, overuse, excessive training, unstructured activity (30.8% overall, 67% in ages 3-5)	[5,6,9,46,47]
Dance Style Variation	Ballet/pointe: lower extremity sprains/strains; break dancing: upper extremity injuries; tap/folk: knee injuries	[5,6,47]
Risk Factors	Older age, female sex, higher BMI, prior injury, increased training hours, longer dance experience, height, anatomical anomalies (scoliosis), hypermobility, incorrect technique, discipline-specific exposures (e.g., time en pointe)	[8,9,14,44-47]
Severity	48% minor, 41% moderate injuries in pre-professional dancers; bony injuries and knee injuries cause greatest time loss	[44,45]
Prevalence	Lifetime prevalence in professionals: 40-84%; point prevalence of minor injury: 74%; 12-month prevalence in youth: 19-52%	[8,14,44,48]

Injury patterns vary by age and dance style. Younger children (ages 3-10) are more likely to sustain head and neck injuries, often due to falls and unstructured dance activity, which accounts for 67% of injuries in children aged 3-5 years. In contrast, older youth and adolescents experience more lower extremity injuries, particularly in ballet and pointe, where ankle and foot injuries are prevalent. Break dancing is associated with a higher risk of upper extremity injuries [5,6]. Among professional and pre-professional dancers, the lifetime prevalence of musculoskeletal injury ranges from 40% to 84%, with point prevalence of minor injury as high as 74%. Overuse injuries predominate, especially in the foot, ankle, and back, and recurrence is common. Risk factors include high training volume, prior injury, higher BMI, and increased age or years of dance experience. Bone stress injuries and ankle impingement are particularly burdensome in professional ballet, with significant time loss and recurrence rates [2,4,7,8].

Risk factors for injury in dancers include both intrinsic and extrinsic elements. Intrinsic factors such as poor alignment, hypermobility (especially of the hip and ankle), decreased lower extremity strength, poor lumbopelvic control, and previous injury history are associated with increased injury risk [4,9-12]. Extrinsic factors include longer training hours, years of experience with pointe shoes, and inadequate aerobic fitness [11,13]. In young dancers, older age and greater height are independently associated with higher rates of trunk and lower limb injuries [14]. Psychological coping skills and dynamic balance also play a role in injury susceptibility among preprofessional dancers [10,12] (Table 2,3).

Table 2: Risk Factors for Dance Injury.

Specific Risk Factor	Age Group Most Affected	Dance Style Variation	Mechanism/Notes	References
Older age/adolescence	Adolescents (15-19 yrs)	All styles	Higher injury rates, esp. trunk/lower limb	[5,6,14]
Female sex	All ages	All styles	80% of pediatric injuries are in girls	[5,6]
Higher BMI	Adolescents, adults	Modern/contemporary	Associated with increased injury risk	[4,47]
Increased height	Adolescents, young adults	Ballet, tap, folk, Chinese	Higher risk for lower limb injuries	[14,47]
Prior injury history	All ages	All styles	Strong predictor of future injury	[4,10,49]
Joint hypermobility	Youth, recreational dancers	Ballet, modern	Hip/ankle hypermobility increases LE injury risk	[9,11]
Poor alignment	All ages	Ballet, modern	Common risk for lower extremity injury	[9,11]
Anatomical anomalies (e.g., scoliosis)	Youth	All styles	Higher injury rates in dancers with anomalies	[9]
Decreased strength/aerobic fitness	Elite dancers, adolescents	Ballet, modern	Poor lumbopelvic control, low strength increase risk	[11]
Longer training hours/ intensity	Adolescents, pre-professionals	Ballet, jazz, contemporary	Higher exposure increases injury risk	[10,11,46,47]

Years of dance experience	Adolescents, adults	All styles	Cumulative exposure increases risk	[10,46,47]
Unstructured dance activity	Young children (3-5 yrs)	All styles	67% of injuries in 3–5 yrs; falls/ noncontact common	[6]
Incorrect technique (e.g., rolling-in)	Youth, recreational dancers	Ballet, modern	Increases overall injury risk	[9]
Discipline-specific exposures	Ballet, tap, folk, break dancing	Ballet: en pointe; Break: upper extremity	Time en pointe increases LE injury; break: UE injury	[6,9,47]
Dynamic overload/overuse	Adolescents, adults	All styles	Most common mechanism in older dancers	[4,8,47]
Falls/noncontact mechanisms	Young children, all ages	All styles	35-45% of injuries; head/neck in young children	[5,6]

Table 3: Key Risk Factors for Dance Injury Based on Dance Style.

Dance Style	Age Group	Key Risk Factors	References
Ballet (Recreational)	Youth (8-16 yrs)	Hyper hip/ankle mobility, alignment, incorrect technique (rolling-in), time en pointe	[9,11]
Ballet (Elite/Preprofessional)	Adolescents/Young Adults	Poor lumbopelvic control, decreased LE strength, poor aerobic fitness, alignment	[11,12]
Modern/Contemporary/Jazz	Adolescents/Adults	Age, body weight, duration of practice	[10,47]
Tap/Folk	Adolescents/Adults	Height, knee injury risk	[47]
Hip Hop/Break Dance	Adolescents/Young Adults	Previous injury, poor dynamic balance, high injury rate	[24]
Pediatric/Young Dancers	Children (3–10 yrs)	Unstructured activity, falls, head/neck injury risk	[5,6]

While injury epidemiology is well-documented across age and genre, translation of this knowledge into targeted prevention remains limited. Over the last few decades, a substantial body of literature has emerged focusing on the prevention of dance-related injuries. Injury prevention strategies in dancers focus on modifiable risk factors. Evidence supports the use of targeted strengthening programs, especially for the lower extremities, and the use of accessories such as ankle supports during classes and rehearsals to reduce injury risk [13,15]. Screening for joint range of motion, anatomical anomalies, and lumbopelvic control can help identify at-risk individuals, while limiting time spent en pointe and ensuring correct technique are recommended for younger and less experienced dancers [9,12]. Comprehensive prevention programs that include physical conditioning, technique correction, and psychological support may decrease future injury incidence, though further high-quality research is needed to optimize these interventions [8,12,15] (Table 4).

Table 4: Current Strategy for Injury Prevention in Dancers.

Strategy	Description	Target Population	Key Components	Efficacy/Outcomes	References
Neuromuscular Training	Structured programs for balance, strength, agility, change of direction	All dancers, esp. youth/ female	10 min, 2x/week; balance, strength, agility, direction change exercises	Decreased LE injuries by 19%, decreased ankle sprains by 39%, decreased ACL by 61%	[50]
Individualized Conditioning	Programs tailored to injury history and screening results	Professional ballet	Functional movement screening, injury history, personalized exercise prescription	Significant decreased in injury incidence over 3 years	[27]
Physical Screening & Surveillance	Regular assessment of modifiable risk factors	All dancers	Dynamic balance, lumbopelvic control, LE strength, functional movement, joint ROM, prior injury	Identifies at-risk dancers for targeted intervention	[9,12,27]
Biomechanical Optimization	Correction of alignment, technique, and muscle strength	Ballet, modern, youth	Core stability, LE muscle strengthening, technique correction, shoe condition, load management	decreased overuse and traumatic injuries, esp. foot/ankle	11, 13, 15
Anatomical/ Technical Screening	Screening for anomalies and technical errors	Youth/recreational dancers	Scoliosis, hypermobility, incorrect technique (e.g. rolling-in), time en pointe	Early identification and prevention of injury	[9,13]

Psychological Assessment & Training	Screening and intervention for stress, coping, burnout, social support	All dancers	Athletic Coping Skills Inventory, Perceived Stress Scale, burnout/social support scales, coping skills training, stress management	Improved coping, decreased injury risk, better rehab outcomes	[12,27]
Education & Wellness Programs	Education for dancers, parents, coaches	All dancers	Injury prevention, wellness, psychological health, load management	Supports long-term musculoskeletal health	[51-53]
Early Medical Assessment	Prompt evaluation and management of injuries	All dancers	Early diagnosis, multidisciplinary care, injury tracking	decreased recurrence, improved outcomes	[8,51,54]
Load Management	Monitoring and adjusting training volume/intensity	Ballet, modern, youth	Control time en pointe, session frequency/duration, shoe wear time	decreased overuse injuries, esp. in lower extremity	[11,13,52]
Accessory Use & Strengthening	Use of lower extremity accessories and supplemental exercise	Ballet	Accessories during class/rehearsal, additional strengthening programs	Protective effect against LE injury	[13]

Despite these advances, a critical component is often overlooked or siloed: the systematic integration of psychological assessment with physical screening. Screening tools have been developed to identify dancers at risk of injury, but their efficacy across different dance genres and levels remains underexplored. Furthermore, psychological factors such as stress, psychological distress, and disordered eating have been associated with both the risk and outcome of dance injuries. Although both physical and psychological determinants of injury have been explored independently, few studies have systematically integrated these domains to guide injury prevention in dancers. This review aims to synthesize recent literature and propose an integrated biopsychosocial screening procedure for injury prevention in dancers.

Dance-Specific Screening Tools and Predictive Validity

Types of Screening Tools and Their Validity

Screening tools are essential in identifying modifiable risk factors that predispose dancers to injury. Dance-specific assessments have evolved from general athletic screening methods to protocols tailored to the unique biomechanical and aesthetic demands of dance. Commonly used tools include measures of dynamic balance, joint range of motion (hip and ankle), lumbopelvic control, lower extremity strength, and functional movement screening [16] (Table 5).

Table 5: Screening Tools Used as Predictor of Injury.

Screening Tool	Description	Predictive Value for Injury	Dance Population	References
Unipedal Dynamic Balance	Time standing on one leg	Protective effect; lower scores predict injury	Preprofessional ballet	[12]
Y-Balance Test	Reach distance in multiple directions	No significant association with injury	Preprofessional ballet	[12]
Star Excursion Balance Test	Dynamic balance in 8 directions	Better scores protective against injury	Hip hop	[24]
Hip/Ankle Range of Motion	Dorsiflexion, plantarflexion, turnout	Mixed evidence; hypermobility risk in recreation	Ballet, contemporary	[9,11,25,40]
Lumbopelvic Control	Movement control tasks	Poor control increases injury risk	Elite ballet	[11,12]
Isometric Hip Abduction Strength	Maximal force output	Decreased strength increases injury risk	Ballet, contemporary	[11,25,26]
Single Leg Hop Test	Horizontal hop distance normalized to height	<78.2% of height predicts LE injury	Collegiate dancers	[17]
Single Leg Squat Kinematics	Ankle dorsiflexion during squat	Excessive dorsiflexion predicts injury	Contemporary dance	[19]
Jumping Asymmetry	Interlimb asymmetry in jump tasks	High asymmetry increases injury risk	Preprofessional ballet	[18]
Previous Injury History	Self-reported prior injury	Strong predictor of future injury	All dance disciplines	[10,16,24,40]
Psychological Coping Skills	Athletic Coping Skills Inventory	Poor coping increases injury risk	Ballet, contemporary	[10,12,16]
Anatomical Anomalies	Scoliosis, foot pronation	Associated with higher injury rates	Recreational dancers	[9]
Dance Technique	Assessment of technical errors (e.g., rolling-in)	Incorrect technique increases injury risk	Recreational dancers	[9]

- **Unipedal dynamic balance Tests:** Lower scores on limb-specific unipedal dynamic balance are significantly associated with increased injury risk in preprofessional ballet dancers, even after adjusting for years of training and psychological coping skills [12]. Unipedal dynamic balance outperforms other common preseason screening measures in predictive validity for dance-related injury [12].

- **Single Leg Hop Test:** In collegiate dancers, a normalized Single Leg Hop distance of less than 78.2% of body height is a significant predictor of lower extremity injury, with good sensitivity (0.75) and specificity (0.70) [17].

- **Jumping Asymmetry (Double-Leg Countermovement Jump and Single-Leg Jump):** High interlimb asymmetry in kinetic variables during Double-Leg Countermovement Jump and Single-Leg Jump is associated with a significantly increased risk of injury in preprofessional ballet dancers, with risk ratios up to 1.69 for certain asymmetry measures [18].

- **Single-Leg Squat Kinematics:** Excessive ankle dorsiflexion during Single-Leg Squat is a significant risk factor for substantial lower extremity injury in contemporary dancers (OR 1.25 per degree increase) [19].

- **The Functional Movement:** Screen composite score has mixed evidence for predictive validity in dance populations. While some meta-analyses in general athletic populations show increased injury risk with scores ≤14, the predictive value is limited and inconsistent in dancers and younger athletes [20-23].

Dynamic balance tests demonstrated a protective effect against injury, with better scores associated with reduced injury risk in preprofessional ballet and hip-hop dancers [12,24]. Screening for joint range of motion, particularly ankle dorsiflexion and hip abduction, is important, as both hypo and hypermobility have been linked to increased injury risk depending on dance discipline and level [9-11,25]. Lumbopelvic control and lower extremity strength assessments are also relevant, as poor control and decreased strength are associated with higher rates of lower-extremity injuries in elite ballet dancers [11,26]. Dance Functional Movement Screen, including evaluation of jumping asymmetries and single-leg squat kinematics, can identify dancers at elevated risk for injury, especially those with significant interlimb asymmetries or abnormal movement patterns [11,18,27].

Screening programs are most effective when integrated into comprehensive wellness initiatives, with individualized conditioning programs based on screening results shown to reduce injury incidence in professional ballet companies [27,28]. Validation studies in dance populations demonstrate moderate reliability for these tests, with the Y-Balance and Functional Movement Screen showing particular utility in identifying dancers at risk for lower extremity injuries. However, predictive power varies across populations and training levels, emphasizing the need for consistent protocols and normative data specific to dance genres.

Predictive Evidence and Limitations

The predictive validity of screening tools in dance is limited by several methodological and conceptual challenges. Prospective studies have demonstrated that impaired balance, asymmetric flexibility, and reduced core control are associated with increased injury incidence in dancers, but the effect sizes are generally small to moderate, and the predictive power is limited. For example, dynamic balance and lumbopelvic control have shown statistically significant but modest associations with injury risk in preprofessional ballet dancers, especially when adjusted for psychological coping skills and years of training, highlighting the multifactorial nature of injury risk [12,18]. However, many studies are constrained by small sample sizes, heterogeneous populations, and inconsistent injury definitions, which restrict generalizability and preclude robust meta-analytic synthesis [10,11].

Most investigations employ cross-sectional or retrospective designs, limiting causal inference and the ability to establish temporal relationships between screening findings and injury outcomes [10,11]. Furthermore, the majority of screening protocols focus narrowly on physical parameters, often neglecting psychosocial factors such as coping skills, stress, and perfectionism, which have been shown in prospective studies to independently predict injury risk in dance populations [29,30]. For instance, limited coping skills and elevated stress levels are associated with higher injury rates, and integrating these psychosocial variables into screening improves risk stratification [29,30].

Psychological Assessments and Predictive Validity

Psychological Factors Influencing Injury Risk

Psychological health is a pivotal factor in both the occurrence and recovery of injuries among dancers, with substantial literature supporting the role of stress, perfectionism, coping skills, and social support in injury risk and rehabilitation [31].

High physical and emotional demands, performance pressure, and a perfectionistic culture in dance environments contribute to chronic stress, anxiety, and burnout. Multiple studies and consensus statements confirm that elevated psychological stress increases susceptibility to injury, impairs motor coordination, and delays recovery. High levels of perceived stress and burnout are consistently correlated with increased injury rates, while limited coping skills independently predict substantial injury risk in both professional and student dancers [29-31]. Social support, particularly from family, is protective, with lower perceived support linked to higher injury incidence [31]. The American College of Sports Medicine and the American Medical Society for Sports Medicine recommend routine monitoring of stress and coping skills, as well as assessment of major life events, to identify dancers at elevated risk and to implement stress management interventions for injury prevention [32].

Tools for Psychological Screening in Dancers

A range of validated instruments has been used to evaluate psychological well-being, coping strategies, and stress responses in

both athletic and dance groups. The most widely used instruments include the Perceived Stress Scale, Athletic Coping Skills Inventory, Athletic Burnout Questionnaire, and the Multidimensional Scale of Perceived Social Support. These tools measure stress, coping ability, burnout, and perceived social support, all of which have demonstrated significant associations with injury risk in dancers [29-31,33]. The Athletic Burnout Questionnaire assesses emotional exhaustion, reduced accomplishment, and sport devaluation, providing valuable insights into chronic stress and maladaptive motivation [31]. Meanwhile, the Multidimensional Scale of Perceived Social Support evaluates perceived emotional and practical support from peers, family, and instructors, which has been shown to buffer the negative effects of stress and prevent injury-related psychological decline [31] (Table 6).

Table 6: Psychological Assessment Tools Used as Predictor of Injury.

Assessment Tool	Purpose/Construct Measured	Predictive Value/Use in Dancer Injury Prevention	References
Perceived Stress Scale	Perceived stress	Higher stress scores are associated with increased injury risk in professional and student dancers	[29,31]
Athletic Coping Skills Inventory	Coping skills	Limited coping skills independently predict higher injury rates; used in screening and prevention programs	[12,16,30,31]
Athletic Burnout Questionnaire	Burnout (emotional/physical exhaustion)	Higher burnout scores (reduced accomplishment, dance devaluation) are linked to increased injury risk	[31]
Multidimensional Scale of Perceived Social Support	Social support (family, friends, others)	Lower perceived social support, especially from family, is associated with higher injury incidence	[31]
Coaching Behaviour Questionnaire	Dancer-leader relationship	Negative coach interactions and decreased coachability are associated with increased injury risk	[31]
Patient Health Questionnaire-9	Depression symptoms	Depression symptoms can affect injury risk and recovery; recommended for routine screening in athletes	[35]
Generalized Anxiety Disorder-7	Anxiety symptoms	Anxiety symptoms can affect injury risk and recovery; recommended for routine screening in athletes	[34,35]
Athlete Psychological Strain Questionnaire	Psychological strain	Used for broader mental health screening in athletes, including dancers	[35]
Performing artist and Athlete Health Monitor	Coping, perfectionism, self-regulation	Web-based system; lower coping skills measured by PAHM predict substantial injury in contemporary dancers	[30]
Visual Analog Scale for Stress	General stress (0-100 scale)	Higher monthly stress scores are associated with increased injury risk in dance students	[29]
Sport Mental Health Assessment Tool 1	Mental health symptoms/disorders	Screening tool for mental health symptoms and disorders in elite athletes, including dancers	[35]
Athlete Sleep Screening Questionnaire	Sleep disturbance	Sleep disturbance is a risk factor for injury and is recommended for routine screening	[35]
Pain Catastrophizing Scale	Catastrophic thinking about pain	High scores may affect injury recovery and risk; used in monitoring psychological factors during rehabilitation	[34]
Tampa Scale of Kinesiophobia	Fear of movement/reinjury	High kinesiophobia is associated with delayed recovery and may increase risk of reinjury	[32,35]
Reinjury Anxiety Inventory	Reinjury anxiety	Assesses anxiety about reinjury, which can impact return to dance and risk of further injury	[35]
Injury–Psychological Readiness to Return to Sport	Psychological readiness for return	Assesses readiness to return to dance after injury; low readiness is associated with increased risk of reinjury	[35]
Fear Avoidance Beliefs Questionnaire	Fear avoidance beliefs	Assesses beliefs about physical activity and pain; high scores may contribute to injury risk and delayed recovery	[35]
ACL-Return to Sport after Injury	Psychological readiness post-ACL injury	Measures psychological readiness after ACL injury; low scores are associated with increased risk of reinjury	[35]

In dance-specific contexts, modified versions of these instruments have demonstrated strong reliability and internal consistency. For instance, the Dance-Specific Psychological Screening Questionnaire, currently under validation, integrates components from the Athletic Coping Skills Inventory and Athletic Burnout Questionnaire with items targeting body image, performance pressure, and audition-related anxiety [31]. The use of such tailored tools allows for a more accurate reflection of the unique psychosocial challenges inherent to dance training and performance [31].

- **Perceived Stress Scale:** Assesses perceived stress levels, which are strongly correlated with injury risk in professional dancers. Elevated stress increases injury likelihood, and stress management interventions are recommended for prevention [31,32,34].

- **Athletic Coping Skills Inventory:** Measures coping abilities; limited coping skills independently predict higher injury rates in both contemporary and ballet dancers. Coping skills training is suggested as a preventive strategy [12,16,30,31]. Athletic Burnout Questionnaire: Evaluates burnout dimensions (e.g., reduced accomplishment, dance devaluation), with higher burnout scores associated with increased injury risk [31].

- **Multidimensional Scale of Perceived Social Support:** Assesses perceived support from family, friends, and significant others; lower social support is linked to higher injury incidence [31].

- **Coaching Behavior Questionnaire:** Examines dancer-leader relationships; negative interactions and decreased coachability are associated with increased injury risk [31].

- **Patient Health Questionnaire-9 and Generalized Anxiety Disorder-7:** Screen for depression and anxiety, respectively; these mental health symptoms can affect injury risk and recovery and are recommended for routine use by the American College of Sports Medicine [32,35].

- **Athlete Psychological Strain Questionnaire:** Used for broader mental health screening in athletes, including dancers [35].

- **Positive and Negative Affect Schedule:** Frequently used to measure well-being, which is associated with injury risk and recovery [33].

- **Performing Artist and Athlete Health Monitor:** Web-based system for monitoring coping, perfectionism, and self-regulation, with evidence supporting its use in predicting substantial injuries [30].

Predictive Evidence

The psychological assessment tools with the strongest evidence for predictive validity and reliability in dancer populations and are most effective for injury prevention when used as part of a targeted intervention program are the Athletic Coping Skills Inventory, Perceived Stress Scale, Athletic Burnout Questionnaire, and Multidimensional Scale of Perceived Social Support (Table 6).

The Athletic Coping Skills Inventory demonstrates robust predictive validity for injury risk in both contemporary and ballet dancers, with limited coping skills independently associated with higher injury rates in prospective cohort studies. Targeted coping skills training based on Athletic Coping Skills Inventory results is effective in reducing injury incidence [12,30,31]. The Perceived Stress Scale reliably predicts injury risk, with higher stress scores preceding and accompanying injury episodes in contemporary and folk dancers; stress management interventions based on this screening have demonstrated efficacy in injury reduction [29,31]. The Athletic Burnout Questionnaire and Multidimensional Scale of Perceived Social Support also show strong associations with injury risk, with higher burnout and lower social support correlating with increased injuries across dance disciplines [31].

Athletic Coping Skills Inventory, Perceived Stress Scale, Positive and Negative Affect Schedule, and youth-specific depression and anxiety measures are recommended for routine screening, as limited coping skills and elevated stress have demonstrated predictive value for injury occurrence [29,30,33,36,37]. The American Academy of Pediatrics and the American College of Sports Medicine recommend regular mental health screening in youth athletes, including dancers, using age-appropriate, psychometrically validated instruments [35,37]. Meta-analyses in the broader sports medicine literature confirm that psychological interventions targeting stress and coping guided by these validated tools consistently reduce injury rates in athletes, including dancers [34,38]. Across studies, coping skills, perceived stress, burnout, and social support consistently emerge as the strongest psychological predictors of injury risk. Integrating these measures within screening protocols allows for both risk identification and targeted mental skills interventions.

Integrated Biopsychosocial Framework for Injury Prevention

Integrating psychological assessment within injury prevention frameworks enables early identification of at-risk dancers and the development of targeted interventions. Screening results can inform individualized strategies, such as mindfulness training, stress management, and resilience-building programs, which complement physical conditioning and technical training. For example, incorporating short mindfulness-based sessions or cognitive-behavioral coping strategies into regular warm-ups has been associated with reductions in injury rates and improvements in performance consistency. Moreover, collaboration between dance educators, mental health professionals, and physiotherapists enhances the effectiveness of preventive measures. By aligning physical and psychological findings, instructors can adjust workload intensity, provide timely psychological support, and encourage open dialogue about mental health challenges.

Rationale for Integration

Dancers' injury risk is influenced by a dynamic interplay of physical, psychological, and environmental factors. While dance-specific physical screening tools identify biomechanical vulnerabilities such as deficits in balance, strength, or lumbopelvic

control, psychological assessments capture stress, coping capacity, burnout, and perceived social support [11,31,33]. Evidence increasingly supports the premise that combining these domains enhances the accuracy of injury risk prediction. For example, dancers with moderate physical deficits may remain injury-free if they possess strong coping strategies, whereas individuals with similar biomechanical profiles but poor psychological resilience are more likely to sustain injuries [30,32,34].

The biopsychosocial model provides the theoretical foundation for this approach, emphasizing that injury prevention should not isolate physical risk factors from mental and social dimensions. By integrating both domains, practitioners can identify at-risk dancers more comprehensively and tailor interventions to address both biomechanical and psychological vulnerabilities.

Advantages

Early identification of risk factors: Integrating physical and psychological screening enables detection of modifiable and non-modifiable risks before injury occurs, allowing for proactive intervention [12,25,30,31,39].

- **Tailored Interventions:** Individualized conditioning programs based on screening results and injury history have demonstrated significant reductions in injury incidence in ballet populations [27].

- **Improved Well-Being and Mental Health Support:** Addressing psychological factors such as stress, burnout, and coping skills can enhance overall dancer well-being and may reduce injury risk [31,33,35].

- **Multidisciplinary Approach:** Involving medical, psychological, and artistic staff fosters program buy-in, improves ecological validity, and enhances the effectiveness of screening and prevention programs [28].

Proposed Procedure for Implementation

First: Conduct baseline physical screening using validated dance-specific tools. These include measures of dynamic balance (e.g., unipedal dynamic balance time, Y-Balance Test), lumbopelvic control, joint range of motion (hip and ankle dorsiflexion, plantarflexion, total active turnout), and isometric hip strength [11,12,24-26]. These assessments should be performed at the start of the training season and compared to established normative data to identify physical deficits or asymmetries that may increase injury risk.

Second: Administer psychological assessments using instruments with demonstrated predictive value for injury risk. The Athletic Coping Skills Inventory is recommended for evaluating coping skills, while the Perceived Stress Scale and Athletic Burnout Questionnaire can be used to assess stress and burnout, respectively [10,16,30,31,39]. These tools should be selected based on the dance population (e.g., preprofessional ballet, contemporary, folk, or Irish dancers) and integrated into the screening protocol.

Third: Analyze the results from both physical and psychological screenings using multivariate models to identify dancers at elevated risk. Adjust for confounding factors such as age, years of training, and BMI, as these have been shown to interact with both physical and psychological risk factors [10,12,16,30].

Fourth: Use the combined screening data to inform individualized injury prevention strategies. This may include targeted conditioning programs, coping skills training, psychosocial support, and regular follow-up assessments to monitor progress and adapt interventions as needed [27,28].

Finally: Implement ongoing injury surveillance and feedback mechanisms to evaluate the effectiveness of the integrated screening procedure and refine the protocol based on injury incidence and stakeholder input [27,28].

Challenges

- **Lack of Consensus and Variable Predictive Value:** There is no universally accepted set of screening tools or injury definitions, and the predictive value of some physical and psychological measures remains inconsistent [10,25,40].

- **Resource and Time Demands:** Comprehensive screening requires significant investment in personnel, time, and infrastructure, which may be challenging for some organizations [28].

- **Stigma and Underreporting:** Dancers may underreport psychological distress due to stigma or fear of career impact, limiting the effectiveness of psychological assessment [31,33].

- **Limited High-Quality Evidence:** While associations are established, robust prospective data on the efficacy of psychological interventions for injury prevention in dancers are limited [10,31,41].

The combination of dance-specific screening tools and psychological assessments is an effective strategy for injury prevention in dancers, supported by emerging evidence that musculoskeletal injury risk in dancers is multifactorial, involving both physical and psychological domains. In summary, the current literature supports the use of combined dance-specific and psychological screening tools to inform injury prevention strategies in dance populations. Future research should focus on longitudinal designs, validated dancer-specific measures, and intervention studies to establish causality and optimize prevention [33,42,43].

Discussion

Injury prevention in dancers requires a nuanced understanding of the multifactorial nature of injury risk, encompassing both physical and psychological dimensions. The integration of dance-specific screening tools with psychological assessments represents a promising advancement toward a holistic, evidence-based framework for safeguarding dancer health and optimizing performance longevity. Literature consistently underscores that musculoskeletal injuries in dance arise not merely from biomechanical overload or technical faults, but also from psychosocial stressors, maladaptive coping mechanisms, and insufficient recovery practices. Consequently, an integrated biopsychosocial approach - combining objective physical measures with validated

psychological instruments provides a more complete risk profile than either domain alone. Dance-specific screening tools remain central to identifying biomechanical vulnerabilities and modifiable risk factors. Assessments of dynamic balance, lumbopelvic control, joint range of motion, lower-extremity strength, and functional movement continue to demonstrate predictive associations with injury incidence across ballet, contemporary, and other genres. Tools such as the Unipedal Dynamic Balance test, Single-Leg Hop test, and analysis of jump asymmetries have shown the ability to prospectively identify dancers at increased risk of lower-extremity injury. When applied within structured wellness programs, these assessments enable individualized conditioning interventions that significantly reduce injury rates and recurrence.

However, while physical screenings capture the biomechanical dimension of injury susceptibility, they cannot fully account for the cognitive, emotional, and behavioral factors that influence injury onset and recovery. Psychological assessments fill this crucial gap by evaluating stress, coping, burnout, and social support domains that directly affect physiological vulnerability and behavioral adherence to training and rehabilitation. Instruments such as the Athletic Coping Skills Inventory, Perceived Stress Scale, Athletic Burnout Questionnaire, and Multidimensional Scale of Perceived Social Support have demonstrated strong predictive validity in dancer populations. Elevated stress, diminished coping ability, and reduced social support independently predict both the occurrence and severity of injury. Evidence also suggests that psychological interventions particularly those aimed at stress management, mindfulness, and coping-skills training can reduce injury incidence and enhance recovery trajectories. Thus, integrating psychological assessment within screening programs not only enables early identification of at-risk dancers but also facilitates timely mental health support and performance sustainability.

The convergence of physical and psychological screening within an integrated model offers several advantages. First, it allows early detection of both biomechanical and psychosocial risk factors, enabling proactive, individualized prevention strategies. Second, it enhances the ecological validity of screening by acknowledging the complex, real-world interplay between body and mind in dance performance. Third, it fosters collaboration among multidisciplinary professionals including physicians, physiotherapists, psychologists, and artistic staff thereby improving program adherence and dancer engagement. The implementation of combined screening frameworks within professional companies and training academies has demonstrated tangible benefits, including reduced injury rates, improved communication between medical and artistic teams, and greater dancer satisfaction with health management processes. Nonetheless, important challenges remain. The predictive value of individual screening tools can vary, and there is no consensus regarding optimal test batteries, frequency, or thresholds for clinical decision-making. Psychological screening, while valuable, is hindered by stigma, underreporting, and variability in tool selection across contexts. Furthermore, most available evidence remains correlational rather than causal, with a scarcity of large-scale, longitudinal intervention studies specifically validating combined screening approaches in dance populations. Addressing these gaps will require methodological standardization, harmonized injury definitions, and interdisciplinary collaboration across institutions.

Future research should prioritize the development of validated, dancer-specific screening protocols that integrate physical and psychological domains within a unified data framework. Longitudinal cohort studies are needed to establish temporal relationships between screening outcomes and injury incidence, while randomized controlled trials should evaluate the effectiveness of tailored prevention programs derived from integrated screening data. Moreover, digital monitoring systems such as web-based wellness platforms and wearable technologies offer new opportunities for real-time assessment of both physical load and psychological well-being. These innovations could enhance the feasibility, scalability, and precision of injury prevention initiatives across diverse dance environments.

Conclusion

Integrating dance-specific screening tools with psychological assessments marks a paradigm shift in injury prevention for dancers. This holistic approach recognizes that the physical body and psychological state are inseparable components of performance health. By identifying at-risk dancers through combined assessment, implementing individualized interventions, and fostering multidisciplinary collaboration, the dance community can move toward a more sustainable and health-centered culture. Continued investment in research, education, and systematic implementation will be critical to transforming these integrative models from emerging best practice into standard care ensuring that dancers not only perform at their highest potential but also enjoy sustainable, healthy careers.

References

1. Yin AX, Sugimoto D, Martin DJ, Andrea Stracciolini (2016) Pediatric Dance Injuries: A Cross-Sectional Epidemiological Study. PM R 8(4): 348-355.
2. Drysdale L, Gomes Z, Toohey L, Kate Pumpa, Phil Newman, et al. (2023) Musculoskeletal Injury in an Australian Professional Ballet Company, 2018-2021: 953 Medical-Attention and 706 Time-Loss Injuries Over 4 Years. J Orthop Sports Phys Ther 53(11): 712-722.
3. Barreau X, Courtin C, Ramos Pascual S, Ankitha Kumble, Mo Saffarini, et al. (2024) Epidemiology of Musculoskeletal Injuries in Professional Ballet Dancers at the Opera de Paris. Clin J Sport Med 35(4): 489-497.
4. Sun Y, Liu H (2024) Prevalence and risk factors of musculoskeletal injuries in modern and contemporary dancers: a systematic review and meta-analysis. Front Public Health 12: 1325536.
5. Roberts KJ, Nelson NG, McKenzie L (2013) Dance-related injuries in children and adolescents treated in US emergency departments in 1991-2007. J Phys Act Health 10(2): 143-150.
6. Dadoo S, Kistamgari S, McKenzie LB, Jingzhen Yang, Gary A Smith, et al. (2023) Pediatric Dance-Related Injuries Treated in Emergency Departments in the United States, 2000-2020. Pediatr Emerg Care 39(9): 654-660.
7. Critchley ML, Ferber R, Pasanen K, Sarah J Kenny (2022) Injury epidemiology in pre-professional ballet dancers: A 5-year prospective cohort study. Phys Ther Sport 58: 93-99.

8. Hincapie CA, Morton EJ, Cassidy JD (2008) Musculoskeletal injuries and pain in dancers: a systematic review. Arch Phys Med Rehabil 89(9): 1819-1829.
9. Steinberg N, Siev Ner I, Peleg S, Gali Dar, Youssef Masharawi, et al. (2012) Extrinsic and intrinsic risk factors associated with injuries in young dancers aged 8-16 years. J Sports Sci 30(5): 485-495.
10. Kenny SJ, Whittaker JL, Emery CA (2016) Risk factors for musculoskeletal injury in preprofessional dancers: a systematic review. Br J Sports Med 50(16): 997-1003.
11. J LB, Stracciolini A, Fraser J, Lyle J Micheli, Dai Sugimoto, et al. (2021) Risk Factors for Lower-Extremity Injuries in Female Ballet Dancers: A Systematic Review. Clin J Sport Med 31(2): e64–e79.
12. Critchley ML, Bonfield S, Ferber R, Kati Pasanen, Sarah J Kenny, et al. (2023) Relationships Between Common Preseason Screening Measures and Dance-Related Injuries in Preprofessional Ballet Dancers. J Orthop Sports Phys Ther 53(11): 703-711.
13. Huang PY, Lin CW, Jankaew A, Cheng Feng Lin (2022) Relationship of Extrinsic Risk Factors to Lower Extremity Injury in Collegiate Ballet Dancers. Front Bioeng Biotechnol 10: 878448.
14. Hung RKH, Yung PSH, Ling SKK, Dino Samartzis, Cliffton Chan, et al. (2023) Prevalence of dance-related injuries and associated risk factors among children and young Chinese dance practitioners. Medicine (Baltimore) 102(47): e36052.
15. Li F, Adrien N, He Y (2022) Biomechanical Risks Associated with Foot and Ankle Injuries in Ballet Dancers: A Systematic Review. Int J Environ Res Public Health 19(18): 4916.
16. Kenny SJ, Palacios Derflingher L, Shi Q, Jackie L Whittaker, Carolyn A Emery, et al. (2019) Association Between Previous Injury and Risk Factors for Future Injury in Preprofessional Ballet and Contemporary Dancers. Clin J Sport Med 29(3): 209-217.
17. Ambegaonkar JP, Schock CS, Caswell SV, Nelson Cortes, Matthew A Wyon, et al. (2018) Lower Extremity Horizontal Work but Not Vertical Power Predicts Lower Extremity Injury in Female Collegiate Dancers. J Strength Cond Res 32(7): 2018-2024.
18. MacSweeney NDH, Shaw JW, Simkin GP, Charles R Pedlar, Daniel D Cohen, et al. (2024) Jumping Asymmetries and Risk of Injuries in Preprofessional Ballet. Am J Sports Med 52(2): 492-502.
19. Van Seters C, van Rijn RM, van Middelkoop M, Janine H Stubbe (2020) Risk Factors for Lower-Extremity Injuries Among Contemporary Dance Students. Clin J Sport Med 30(1): 60-66.
20. Moran RW, Schneiders AG, Mason J, S John Sullivan (2017) Do Functional Movement Screen (FMS) composite scores predict subsequent injury? A systematic review with meta-analysis. Br J Sports Med 51(23): 1661-1669.
21. Moore E, Chalmers S, Milanese S, Joel T Fuller (2019) Factors Influencing the Relationship Between the Functional Movement Screen and Injury Risk in Sporting Populations: A Systematic Review and Meta-analysis. Sports Med 49(9): 1449–1463.
22. Liu H, Ding H, Xuan J, Xing Gao, Xuejuan Huang, et al. (2023) The functional movement screen predicts sports injuries in Chinese college students at different levels of physical activity and sports performance. Heliyon 9(6): e16454.
23. Bonazza NA, Smuin D, Onks CA, Matthew L Silvis, Aman Dhawan, et al. (2017) Reliability, Validity, and Injury Predictive Value of the Functional Movement Screen: A Systematic Review and Meta-analysis. Am J Sports Med 45(3): 725–732.
24. Ursej E, Sekulic D, Prus D, Goran Gabrilo, Petra Zaletel, et al. (2019) Investigating the Prevalence and Predictors of Injury Occurrence in Competitive Hip Hop Dancers: Prospective Analysis. Int J Environ Res Public Health 16(17): 3214.
25. Kiss JL, Critchley ML, Kenny SJ (2025) Normative Data for Preseason Screening Assessments in Female University Contemporary Dancers. J Strength Cond Res 39(9): e1099–e1104.
26. Gamboa JM, Roberts LA, Maring J, Andrea Fergus (2008) Injury patterns in elite preprofessional ballet dancers and the utility of screening programs to identify risk characteristics. J Orthop Sports Phys Ther 38(3): 126–136.
27. Allen N, Nevill AM, Brooks JH, Yiannis Koutedakis, Matthew A Wyon, et al. (2013) The effect of a comprehensive injury audit program on injury incidence in ballet: a 3-year prospective study. Clin J Sport Med 23(5): 373–378.
28. Clark T, Gupta A and Ho CH (2014) Developing a dancer wellness program employing developmental evaluation. Front Psychol 10(5): 731.
29. van Winden D, van Rijn RM, Savelsbergh GJP, Raôul RD Oudejans, Janine H Stubbe, et al. (2021) The Association Between Stress and Injury: A Prospective Cohort Study Among 186 First-Year Contemporary Dance Students. Front Psychol 5(12): 770494.
30. Van Winden D, Van Rijn RM, Savelsbergh GJP, Raôul RD Oudejans, Janine H Stubbe, et al. (2020) Limited Coping Skills, Young Age, and High BMI Are Risk Factors for Injuries in Contemporary Dance: A 1-Year Prospective Study. Front Psychol 10(11): 1452.
31. Almasy C, Fedor AR (2025) Psychosocial Aspects of Injuries Among Professional Folk Dancers. Int J Environ Res Public Health 22(17): 1044.
32. (2017) Psychological Issues Related to Illness and Injury in Athletes and the Team Physician: A Consensus Statement-2016 Update. Med Sci Sports Exerc 49(5): 1043–1054.
33. Yu H, Teo EW, Tan CC, Jindong Chang, Shenghui Liu, et al. (2025) Exploring the factors associated with professional and non-professional dancer well-being: a comprehensive systematic review. Front Psychol 16: 1644253.
34. Ivarsson A, Johnson U, Andersen MB, Ulrika Tranaeus, Andreas Stenling, et al. (2017) Psychosocial Factors and Sport Injuries: Meta-analyses for Prediction and Prevention. Sports Med 47(2): 353-365.
35. Herring SA, Putukian M, Kibler WB, Lance Leclere, Lori Boyajian O Neill, et al. (2024) Team Physician Consensus Statement: Return to Sport/ Return to Play and the Team Physician: A Team Physician Consensus Statement-2023 Update. Med Sci Sports Exerc 56(5): 767-775.
36. Thapar A, Eyre O, Patel V, David Brent (2022) Depression in young people. Lancet 400 (10352): 617-631.
37. Weitzman C, Guevara J, Curtin M, Michelle Macias (2025) Promoting Optimal Development: Screening for Mental Health, Emotional, and Behavioral Problems: Clinical Report. Pediatrics 156(3): e2025073172.
38. Gledhill A, Forsdyke D, Murray E (2018) Psychological interventions used to reduce sports injuries: a systematic review of real-world effectiveness. Br J Sports Med 52(15): 967-971.
39. Cahalan R, O'Sullivan P, Purtill H, N Bargary, O Ni Bhriain, et al. (2016) Inability to perform because of pain/injury in elite adult Irish dance: A prospective investigation of contributing factors. Scand J Med Sci Sports 26(6): 694-702.
40. van Rijn RM, Stubbe JH (2021) Generalized Joint Hypermobility and Injuries: A Prospective Cohort Study of 185 Pre-Professional Contemporary Dancers. J Clin Med 10(5):1007.
41. Callahan E, Mangum LC (2025) Exploring Trends between Dance Experience, Athletic Participation, and Injury History. Int J Sports Phys Ther 20(3): 410-419.
42. Fong Yan A, Nicholson LL, Ward RE, Claire E Hiller, Gene Moyle, et al. (2024) The Effectiveness of Dance Interventions on Psychological and Cognitive Health Outcomes Compared with Other Forms of Physical Activity: A Systematic Review with Meta-analysis. Sports Med 54(5):

1179-1205.

43. Dwarika MS, Haraldsen HM (2023) Mental health in dance: A scoping review. Front Psychol 14: 1090645.
44. Dang Y, Koutedakis Y, Chen R, Matthew Wyonet (2024) Injury incidence and severity in Chinese pre-professional dancers: A prospective weekly monitoring survey. J Sci Med Sport 27(2): 86–91.
45. Ekegren CL, Quested R, Brodrick A (2014) Injuries in pre-professional ballet dancers: Incidence, characteristics and consequences. J Sci Med Sport 17(3): 271-275.
46. Steinberg N, Aujla I, Zeev A, E Redding (2014) Injuries among talented young dancers: findings from the U.K. Centres for Advanced Training. Int J Sports Med 35(3): 238-244.
47. Campoy FA, Coelho LR, Bastos FN, Carlos Marcelo Pastre, Henrique Luiz Monteiro, et al. (2011) Investigation of risk factors and characteristics of dance injuries. Clin J Sport Med 21(6): 493-498.
48. Vassallo AJ, Trevor BL, Mota L, Evangelos Pappas, Claire E Hiller, et al. (2019) Injury rates and characteristics in recreational, elite student and professional dancers: A systematic review. J Sports Sci 37(10): 1113-1122.
49. Wiesler ER, Hunter DM, Martin DF, WW Curl, H Hoen, et al. (1996) Ankle flexibility and injury patterns in dancers. Am J Sports Med 24(6): 754-757.
50. Bullock GS, Raisanen AM, Martin C, Maitland Martin, Jean Michel Galarneau, et al. (2025) Prevention strategies for lower extremity injury: a systematic review and meta-analyses for the Female, Woman and Girl Athlete Injury Prevention (FAIR) Consensus. Br J Sports Med 59(22):1575-1586.
51. Rietveld AB (2013) Dancers' and musicians' injuries. Clin Rheumatol 32(4): 425-434.
52. Leanderson C, Leanderson J, Wykman A, Lars Erik Strender, Sven Erik Johansson, et al. (2011) Musculoskeletal injuries in young ballet dancers. Knee Surg Sports Traumatol Arthrosc 19(9): 1531-1535.
53. Toledo SD, Akuthota V, Drake DF, Scott F Nadler, Larry H Chou, et al. (2004) Sports and performing arts medicine. 6. Issues relating to dancers. Arch Phys Med Rehabil 85: S75-78.
54. McBride C, Bronner S (2022) Injury characteristics in professional modern dancers: A 15-year analysis of work-related injury rates and patterns. J Sports Sci 40(7): 821-837.

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