

سیزدهمین کنفرانس کشوری سوختگی

برنامه علمی



هوش مصنوعی
و سوختگی

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سیرد، مبین
کنگره کشوری سوختگی

دبیرخانه علمی: مرکز تحقیقات سوختگی دانشگاه علوم پزشکی ایران
تهران، خیابان ولی عصر، خیابان شهید یاسمی
تلفکس: ۰۲۱۸۸۸۸۴۲۷۵



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بسم الله الرحمن الرحيم

شکر خدای عز و جل را که آتش برافروخته از جهل، سرکشی و تکبر
نمرود را بر حضرت ابراهیم خلیل (ع) گلستان نمود.
هر چند بشر قدرت گلستان نمودن آتش برافروخته را ندارد اما می
تواند گلستانی از فرهنگ و شرایط زندگی فردی و اجتماعی را با مشارکت
جامعه فراهم نماید تا آتش، شعله و سوزاندگیش همنوعی را نسوزاند.

همکاران و بزرگواران ارجمند خدای را سپاس که در سیزدهمین کنگره کشوری سوختگی
در آذر ماه ۱۴۰۴ گردهم خواهیم آمد تا تجارب خود و مشکلات، حوادث و عواقب سوختگی
که گریبانگیر ما و جامعه است را به بحث گذاشته و چالش های موجود و مزمین در سوختگی
را به بحث بگذاریم. به امید برداشتن گامی در پیشگیری و مراقبت یکپارچه از قربانیان سوختگی
و دیدن روزی که امید و هستی خانواده های در رنج سوختگی یکی از اعضایش خاکستر نشود.
بدیهی است شعار این کنگره همانند شعار کنگره های قبلی هدفمند می باشد. با آگاهی
از توان و قدرت هوش مصنوعی در اکثر جنبه های زندگی بشری در حال حاضر و به ویژه
در آینده بسیار نزدیک در بحث سوختگی نیز این باب گشوده شود تا جامعه ما در توانایی
کاربرد و بهره مندی از این ابزار علمی دچار غفلت و حسرت و دیرشدن نشود و تلاش و همت
بکار بندد تا با اراده قوی در قلمرو سوختگی و هوش مصنوعی در تمام زمینه های مرتبط با
سوختگی شامل پیشگیری و مراقبت بالینی در سوختگی حاد، کنترل عفونت، تغذیه، بازتوانی
و مدیریت درمان عوارض جسمی، روانی و اجتماعی سوختگی بتوانیم پیشرو باشیم که این امر
اراده و پشتکار علمی و اجتماعی را می طلبد.

امیدوارم در این کنگره این نیاز واقعی و اصیل اجتماعی و الزام مسئولیت آور را به گوش
سیاستگذاران، مجریان و جامعه آشنا سازیم و برای مطالبه پایدار بوده و اصرار بورزیم و در نیل
به اهداف پیش بینی شده در این کنگره شاهد موفقیت باشیم و صدای این تلنگر را در سالهای
بعد در لباس و قامت برنامه و رویکرد بالینی در پیشگیری و مراقبت سوختگی بکار بندیم.

وظیفه خود می دانم از تلاش تمام دست اندرکاران و حامیان برگزاری کنگره و همچنین
عزیزانی که با مشارکت علمی خود در اجرای کنگره سنگ تمام گذاشتند و نیز مخاطبین و
شما شرکت کنندگان محترم تشکر نمایم.

دکتر طیب قدیمی

رییس سیزدهمین کنگره کشوری سوختگی

با سلام و احترام



کنگره سالیانه سوختگی جایگاه منحصر به فردی در تبادل اطلاعات، دانش و تجربیات دانشمندان و دست اندرکاران این حوزه دارد. استمرار این روند مرهون تلاش و پیگیری همه عزیزانی است که در این عرصه با خلوص نیت به ارائه خدمات می‌پردازند. به عنوان دبیر علمی کنگره سیزدهم خوشحالم به اطلاع برسانم که محور کنگره یکی از به روز ترین عناوین علمی دنیا "هوش مصنوعی و سوختگی" می‌باشد. امیدوارم نوآوری‌های این حوزه بتواند راهگشای بخشی از مشکلات درمانی بیماران عزیز باشد. با افتخار از همه عزیزان دعوت می‌نمایم که در تاریخ ۲۰ لغایت ۲۱ آذر ماه ۱۴۰۴ در مرکز همایش‌های بین‌المللی ابوریحان حضور بهم رسانند و بر غنای علمی و فرهنگی این کنگره بیفزایند.

دکتر مصطفی دهمرده‌ئی

دبیر علمی سیزدهمین کنگره کشوری سوختگی

به نام خدا

تنت به ناز طبیبان نیازمند مباد

وجود نازکت آزرده گزند مباد

سلامت همه آفاق در سلامت توست

به هیچ عارضه شخص تو دردمند مباد



ایران دارای شیوع بالای آسیب‌های ناشی از سوختگی است و در مقایسه با کشورهای منطقه از نظر میزان مرگ و میر و مدت زمان بستری نیز آمار بالاتری دارد. در حالی که پیامدهای سوختگی، آن را از نظر اقتصادی به یکی از پر هزینه ترین آسیب‌ها تبدیل کرده‌اند، آمارهای به دست آمده از مطالعات ریزی موثر خدمات پیشگیری و درمان، شناخت اپیدمیولوژی آن در سطح کشور ضروری است. علیرغم تلاشهای فراوانی که در دانشگاههای مختلف برای راه اندازی برنامه‌های ثبت سوختگی انجام شده و یا در حال انجام است، متأسفانه داده جامع و کاملی در مورد علل سوختگی و پیامدهای بیماران در کشور وجود ندارد.

از سوی دیگر با پیشرفت‌های اخیر حوزه فناوری و جراحی رباتیک، هوش مصنوعی به یکی از ابزارهای مهم در تشخیص و یا ارائه خدمات درمانی تبدیل شده است که می‌تواند با بهبود دقت و سرعت اقدامات درمانی نقش قابل ملاحظه‌ای در ارتقاء کیفیت زندگی افراد داشته باشد. این در حالی است که استفاده از هوش مصنوعی در سوختگی بسیار کم و آن هم محدود به مطالعاتی در حیطه تشخیصی می‌باشد. از این رو لازم است از فرصتی که هوش مصنوعی برای جمع‌آوری سریع اطلاعات و استفاده از داده‌های موجود در اختیار ما قرار داده است، استفاده و با رویکردهای نوین به سمت تدوین و به روز رسانی مستمر استانداردها و گایدلاینهای درمانی و روشهای نوین آموزش و پیشگیری از سوختگی حرکت نماییم.

ما در مرکز تحقیقات سوختگی دانشگاه علوم پزشکی ایران افتخار میزبانی اساتید و همکاران گرامی را در سیزدهمین کنگره کشوری سوختگی در آذر ماه ۱۴۰۴ داریم. محور اصلی این کنگره هوش مصنوعی و سوختگی خواهد بود. امید داریم برگزاری این کنگره گامی کوچک در راستای ارتقای خدمات سلامت ارائه شده به بیماران و پیشگیری از سوختگی باشد.

دکتر سودابه هویدامنش

متخصص پزشکی پیشگیری و اجتماعی

دبیر اجرایی سیزدهمین کنگره کشوری سوختگی

کمیته علمی به ترتیب الفبا:

دکتر ساناز علیزاده	دکتر علی اکبر جعفریان	دکتر ناهید ابولپور
دکتر سیامک فرخ فرقانی	دکتر فرهاد حافظی	دکتر علی احمدآبادی
دکتر علیرضا فیض خواه	دکتر سیدمحمدامین حرمشاهی	دکتر کامران اسعدی
دکتر طیب قدیمی	دکتر وحید حسین پورسرمدی	دکتر ناصر اقدمی
دکتر عبدالخالق کشاورزی	دکتر معصومه حلاج زاده	دکتر حسین اکبری
دکتر نوراحمد لطیفی	دکتر مجید خادم رضائیان	دکتر آزاده امامی
دکتر محمدرضا مبین	دکتر مصطفی دهمرده ئی	دکتر نور امیر مظفری
دکتر آیدین محمد ولیپور	مهناز سیدالشهدائی	دکتر ناصر امینی
دکتر علی اکبر محمدی	دکتر سید حمید صالحی	دکتر مهرنوش اینانلو
دکتر سیده سمیه موسوی	دکتر رضا صالحی	دکتر امیر باجوری
دکتر سهیلا نادری قره قشلاق	دکتر علیرضا صداقت	توران باقری
پرویز نمازی	دکتر سید حسن طاووسی	دکتر نصرت اله بدوحی
دکتر سودابه هویدامنش	دکتر علیرضا طهرانی یزدی	دکتر زینب برزگر
دکتر رضا وقر دوست	دکتر ابوالفضل عباس زاده	دکتر محمد پزشکی مدرس
	دکتر شادی عزیزی	دکتر سید جواد پور افضلی
	دکتر حمیدرضا علیزاده	دکتر بهنام ثبوتی

اسامی داوران به ترتیب حروف الفبا:

دکتر ساناز علیزاده	دکتر سید جواد پور افضلی	دکتر ناهید ابولپور
دکتر سیامک فرخ فرقانی	دکتر معصومه حلاج زاده	دکتر علی احمدآبادی
دکتر طیب قدیمی	دکتر مجتبی دهقان	دکتر ناصر امینی
دکتر سودابه هویدامنش	دکتر سید حمید صالحی	دکتر مهرنوش اینانلو
دکتر محمدرضا مبین	دکتر حسن طاووسی	توران باقری
دکتر سهیلا نادری قره قشلاق	دکتر فرحان عباسی برکی	دکتر زینب برزگر
	دکتر شادی عزیزی	دکتر محمد پزشکی مدرس

کمیته اجرایی به ترتیب الفبا:

آذین فاضلی	توران باقری
دکتر معصومه حلاج زاده	دکتر سیامک فرخ فرقانی
دکتر نور احمد لطیفی	دکتر طیب قدیمی
سمانه معصومی	دکتر مصطفی دهمردهئی
دکتر شادی عزیزی	دکتر ساناز علیزاده
دکتر سودابه هویدا منش	دکتر سهیلا نادری قره قشلاق

همکاران دبیرخانه اجرایی مهنا:

دکتر ندا امین	دکتر سید جواد امامی زاده
سارا احمدی	امیر خیراندیش
خدیجه قربانی	آرزو جامجو
سپهر رضایی	علی طاهری نسب
محمد عشقی	جبار بادیه نشین



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Day
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یزد، زمین کنگره کشوری سوختنی

روز اول پنجشنبه ۲۰ آذر ۱۴۰۴
مرکز همایش های بین المللی ابوریحان
دانشگاه شهید بهشتی



روز اول، پنجشنبه ۲۰ / ۱۴۰۴ / تاراج ابوریحان (همکف)

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دکتر سجاد رضوی	سخنرانی معاون محترم درمان وزارت بهداشت	
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دکتر عبدالخالق کشاورزی		
دکتر زینب برزگر		
دکتر ناهید ابولپور		
دکتر علیرضا فیض خواه		
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دکتر علی اکبر جعفریان	کنترل درد در بیماران سوختگی		۱۵:۱۰-۱۵:۳۰
دکتر راضیه فروتن	Erosion of Prehospital Burn Care Standards: A Qualitative Study of Emergency Medical Service Providers' Experiences		۱۵:۳۰-۱۵:۴۰
دکتر آزاده امامی	Challenges of Pediatric Anesthesia in Burns		۱۵:۴۰-۱۵:۵۵



فاطمه نورمحمدی	Oropharyngeal Dysphagia and Odynophagia in Patients with Thermal Burn Injuries	۱۵:۵۵-۱۶:۰۵
دکتر سید جواد پور افضلی	ارزیابی همودینامیک پیشرفته در بیماران سوختگی	۱۶:۰۵-۱۶:۲۰
دکتر فرهنگ صفرنژاد	Comparison of Fluid Therapy Outcomes by Adding %50 Dextrose to Lactated Ringer's Solution Versus Adding Maintenance Fluid to Calculated Volume in the of Burn Patients Under Five Years Old	۱۶:۲۰-۱۶:۳۰
دکتر سیامک ریماز	Base Deficit, Serum Albumin, and CRP/Albumin Ratio as Prognostic Predictors in Severe Burn Patients	۱۶:۳۰-۱۶:۴۰
مصطفی قاسم پور	Development of a Decision-Support Algorithm for Prehospital Assessment and Triage of Burn Patients: An Expert Consensus Approach	۱۶:۴۰-۱۶:۵۰
دانیال اشجاری	Single-Dose Estradiol Valerate in Severe Burns: Impact on Hospitalization and IL-6	۱۶:۵۰-۱۷:۰۰

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برنامه سمپوزیوم و کارگاههای علمی کنگره سوختگی ۱۴۰۴ پنجشنبه ۲۰ آذر - سالن علامه طباطبائی (تیم طبقه)

نام شرکت	زمان	موضوع	سخنران
ایران فارمیس	۱۱:۳۰-۱۱:۵۰	ارائه کیس استادی سوختگی	دکتر مصطفی دهمرده ای عباس مقیمی
کلوپلاست	۱۱:۵۰-۱۲:۱۰	نقش پانسمان نوین در سوختگی	سحر رضایی
آویژه طب	۱۲:۱۰-۱۲:۳۰	مدیریت زخم و سوختگی به روش دستگاه تشخیص عمق زخم و سوختگی	دکتر عرفان نوروزی
دکتر کامکار فارمد	۱۲:۳۰-۱۳:۳۰	نقش فرآورده های ترمیم کننده در بهبود کیفیت ترمیم سوختگی (برند دکتر کامکار)	دکتر مصطفی دهمرده ای دکتر هومنند دکتر محمد مهدی کامکار
ابتکار توسعه	۱۴:۰۰-۱۵:۰۰	Wound bed preparation in burn wounds with Prontosan	عباس مقیمی
نانوزیست پلیمر پارس	۱۵:۰۰-۱۶:۰۰	نقش محصول هیدروبولانسی در روند ترمیم سوختگی	خسرو جمشیدیان محمد ملکی حسین حسینی

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سیزدهمین کنفرانس ملی سوختگی

روز دوم جمعه ۲۱ آذر ۱۴۰۴
مرکز همایش‌های بین‌المللی ابوریحان
دانشگاه شهید بهشتی



۲۰ الی ۲۱ آذرماه ۱۴۰۴

بیستمین کنفرانس علمی سوختگی



روز دوم، جمعه ۲۱ / ۱۴۰۴/۰۹ تالار ابوریحان (همکف)

تلاوت قران مجید

۸:۰۰-۸:۱۰

هیات رئیسه اول : دکتر فرهاد حافظی - دکتر کامران اسعدی - دکتر سید حمید صالحی - دکتر علی اکبر محمدی - دکتر عبدالخالق کشاورزی

دکتر علی احمد آبادی

Does the Non-Cultured Autologous Keratinocytes Spray Improve the Speed of Epithelialization in Deep Burn Wounds Receiving Wide Meshed Skin Graft?

۸:۱۰-۸:۲۰

محمد جواد برادران

Integrative Management of a Full-Thickness Diabetic Burn Wound Using Maggot Debridement and Mesenchymal Stem Cell-Based Amniotic Membrane Transplantation: A Clinical Case Report

۸:۲۰-۸:۳۰

دکتر سیده سارا هاشمی

Controlled Release of Growth Factors from PRP-Encapsulated Hydrogels for Accelerated Wound Healing

۸:۳۰-۸:۴۰

دکتر محمد پزشکی مدرس

پانسمان های نانولیفی برای درمان سوختگی

۸:۴۰-۹:۰۰

دکتر ناصر اقدمی

دکتر امیر باجوری

دکتر محمد پزشکی مدرس

دکتر سارا هاشمی

دکتر مظاهر قلی پور

دکتر محسن شهروسوند

دکتر طیب قدیمی

دکتر عادل قلی پور کنعانی

دکتر ناصر امینی

گرداننده:
دکتر محمد رضا مبین

پانل:
کاربرد فن آوری نوین
مهندسی بافت و سلول
درمانی در سوختگی

۹:۰۰-۱۰:۳۰

استراحت و پذیرایی و بازدید از پوسترها و نمایشگاه

۱۰:۳۰-۱۱:۰۰



<p>هیات رئیسه دوم: دکتر مصطفی دهمرده ئی - دکتر سیامک فرخ فرقانی - دکتر رضا وقر دوست - دکتر فرهنگ صفر نژاد - دکتر بهنام ثبوتی</p>		
دکتر عبدالخالق کشاورزی	Predicting Clinical Outcomes in Burn Patients Using Machine Learning Models: A Retrospective Analysis	11:00-11:10
دکتر فرهنگ صفر نژاد	Evaluation of the Effect of Plasmapheresis on the Treatment of Patients with Severe Burns (>%50 BSA) Admitted to the Intensive Care Unit	11:10-11:20
دکتر آیدین محمدولی پور	مدیریت disaster در انفجار و آتش سوزی: چالش های تریاژ و درمان	11:20-11:40
دکتر محمدرضا مبین	Evaluation of Intravenous Tranexamic Acid on Bleeding During Burn Surgery: A Double-Blinded Clinical Trial	11:40-11:50
دکتر حمید رضا علیزاده	Study and comparison of the results of amniotic membrane grafting with mupirocin dressing in patients with acute burns over 14 years of age referred to Shahid Motahari Educational and Medical Center in Tehran from 2022 to 2024	11:50-12:00
دکتر علی احمدآبادی	نقش تکنیک جراحی در پیشگیری از اسکار	12:00-12:15
دکتر رامیار فرزانه	Prognostic Value of Serum and Urinary Cortisol and C-reactive Protein in ICU-admitted Burn Patients	12:15-12:25
دکتر نجیبه محسنی معلم کلائی	Prevention and treatment of scars with the help of artificial intelligence in burn patients	12:25-12:35
دکتر نور امیر مظفری	جایگزین های آنتی بیوتیک	12:35-12:50
دکتر سید حسن طاووسی	Challenges in Implementing Artificial Intelligence in Surgical Procedures: A Qualitative Study	12:50-13:00
<p>نماز و ناهار (طبقه دوم-نمازخانه طبقه سوم)</p>		13:00-14:00

درسای حامدی	گرداننده: دکتر مهرانوش اینانلو	پانل: چالش های بازگشت به زندگی بعد از سوختگی و مداخلات موثر	۱۴:۰۰-۱۵:۰۰
دکتر علیرضا جلالی			
دکتر علیرضا فیض خواه			
حسین افشار پویا			
دکتر مهرانوش اینانلو	Treatment Adherence Interventions for Burn Patients: Role of Motivational Interview		۱۵:۰۰- ۱۵:۱۵
دکتر عبدالخالق کشاورزی	کاربرد هوش مصنوعی در بازتوانی سوختگی		۱۵:۱۵- ۱۵:۳۰
اختتامیه			۱۵:۳۰-۱۶:۳۰



روز دوم، جمعه ۲۱ / ۰۹ / ۱۴۰۴ تالار علامه طباطبائی (نیم طبقه)

خوش آمدگویی و اعلام برنامه

۸:۳۰-۸:۴۰

هیات رئیسه اول: دکتر سودابه هویدامنش - دکتر سیده سمیه موسوی - دکتر شادی عزیزی - مهناز سیدالشهدایی - پرویز نمازی

لعیا رحمانی	Survival Prediction in Burn Patients Using Machine Learning Techniques	۸:۴۰-۸:۵۰
دکتر شادی عزیزی	From Models to Automated Pumps: Computer-Aided Fluid Resuscitation in Burn patients	۸:۵۰-۹:۰۰
مهناز سیدالشهدایی	The effect of family-centered education on caregiver burden in caregivers of burn patients	۹:۰۰-۹:۱۰
مهدی جودی	Machine Learning Frameworks for Predicting Hospital Length of Stay and Secondary Complications in Burn Patients: A Systematic Review	۹:۱۰-۹:۲۰
پردیس مهدیبور ابری	Toward Next-Generation Burn Centers: AI- Driven Opportunities to Transform into the Smart Hospital Era	۹:۲۰-۹:۳۰
معصومه سلطانی	Implementation of a Burn Injury Registry in Ahvaz: A Foundational Infrastructure for Health Big Data Generation and Analysis in Southwest Iran	۹:۳۰-۹:۴۰
بنیامین سعادت‌ی فر	The Impact of Mobile Health Education on the Quality of Life of Burn Patients: A Study at Ali Ibn Abi Talib Hospital in Zahedan in 2025	۹:۴۰-۹:۵۰
ساناز معصومی	Robustness of Machine Learning Models for Burn-Depth Classification Under Image Degradations	۹:۵۰-۱۰:۰۰
امیر رضا صفرخانلو	Legal and Ethical Challenges in Burn Injury Management: A Systematic Review	۱۰:۰۰-۱۰:۱۰
محمد مهدی افروزه	Incidence of delirium in burn-affected men with a history of opioid abuse and haven't history of addiction in Ali Ibn Abi Talib (AS) Hospital in Zahedan in 1404	۱۰:۱۰-۱۰:۲۰
دکتر محمد طلوعی	The Effect of Family-Centered Care on Anxiety Levels of Family Members of Hospitalized Burned Children in Velayat Hospital, Rasht	۱۰:۲۰-۱۰:۳۰
استراحت و پذیرایی و بازدید از پوسرها و نمایشگاه		۱۰:۳۰-۱۱:۰۰



۲۰ الی ۲۱ آذرماه ۱۴۰۴

نیزه بین کنفرانس علمی



هیات رئیسه دوم: دکتر وحید حسین پور سرمدی - دکتر سیدمحمدامین حرمشاهی -
دکتر ساناز علیزاده - دکتر سهیلا نادری قره قشلاق - دکتر معصومه حلاج زاده

دکتر سیده سارا هاشمی	Bioengineered PEG/Gel Hydrogels with ZnO and Platelet-Rich Plasma for Accelerated Wound Repair	۱۱:۰۰-۱۱:۱۰
دکتر سهیلا نادری قره قشلاق	Investigation Impact of PVA nanofibers, collagen-coated, containing the conditioned medium of Adipose mesenchymal stem cells (hA-MSCs) in third-degree burn wound healing	۱۱:۱۰-۱۱:۲۰
دکتر غزاله لاریجانی	Fortified Electrospun Collagen Utilizing Biocompatible Poly Glycerol Sebacate prepolymer (PGSp) and Zink Oxide Nanoparticles (ZnO NPs) for Wound Healing: Physical Biological and Animal Studies	۱۱:۲۰-۱۱:۳۰
دکتر لیلا رضاخانی	Acellular kidney capsule: A 3D scaffold for skin regeneration and repair	۱۱:۳۰-۱۱:۴۰
زهره امیدیان	Quantifying Burn Wound Healing Using Gray-Level Co-Occurrence Matrix Analysis: An Exploratory Study	۱۱:۴۰-۱۱:۵۰
دکتر ندا پیرنیه	Antibacterial and anti-biofilm of Green Synthesized Punica granatum Cu/Ag/Zn Nanoparticles against Pseudomonas aeruginosa and staphylococcus aureus	۱۱:۵۰-۱۲:۰۰
دکتر مهدی حجتی	Comparison of the effectiveness of disinfection of ICU environments for burn patients using fogging and UV radiation: An experimental study	۱۲:۰۰-۱۲:۱۰
دکتر محمد طلوعی	Effect of probiotic administration in Inflammatory Responses of thermal burns	۱۲:۱۰-۱۲:۲۰
دکتر سید ابوالفضل طباطبایی	Comparison of the Effects of Silver Nanoparticle Ointment, Mupirocin, and A. yukrohuma Extract Ointment on Histopathological Factors and Wound Size in Burn and Surgical Wounds in Rats	۱۲:۲۰-۱۲:۳۰
لعیا رحمانی	Prediction of Sepsis in Burn Patients Using Machine Learning Technique	۱۲:۳۰-۱۲:۴۰



مجتبی چکوسری	Inhibitory Effects of Postbiotic Compounds Derived from Lactobacillus Strains on Biofilm Formation by Pseudomonas aeruginosa Isolated from Burn Wounds	۱۲:۴۰-۱۲:۵۰
دکتر مهدی حجتی	A case of deep skin lesions resembling second-degree burns after a one-day trip in a forest environment with possible bites: A case report of a -67year-old patient	۱۲:۵۰-۱۳:۰۰
نماز و ناهار (طبقه دوم-نماز خانه طبقه سوم)		۱۳:۰۰-۱۴:۰۰



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تهران، بزرگراه جلال آل احمد، روبروی شهرآرا، خیابان چهارم، شماره ۹، واحد ۶

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◀ رفع سوختگی درجه ۱ الی ۳ (سوختگی با انواع مواد، آفتاب سوختگی و عرق سوز، سوختگی ناشی از لیزر و لیزردرمانی، سوختگی ناشی از رادیوتراپی)

- ✦ تسریع روند ترمیم بافت به سبب تحریک کلاژن سازی
- ✦ رفع التهاب و سوزش در سریع ترین زمان
- ✦ جلوگیری از ایجاد و تشدید عفونت
- ✦ جلوگیری از ایجاد تاول
- ✦ عدم تشکیل اسکار
- ✦ تسکین فوری درد

محلول زخم و سوختگی یونازما

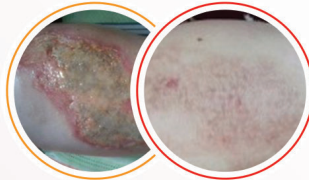
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◀ شستشو، ضد عفونی و ترمیم زخم و سوختگی (خراشیدگی و بریدگی، زخم بستر، زخم دیابتیک، زخم اپی زیاتومی، رادیودرماتیت، زخم و التهاب پس از لیزر و انواع سوختگی)

- ✦ تسریع روند بهبود زخم و سوختگی بواسطه خاصیت رگ‌زایی و افزایش گردش خون
- ✦ کاهش التهاب از طریق مختل سازی تولید سیتوکین‌ها
- ✦ موثر در درمان و کاهش علائم رادیودرماتیت
- ✦ آبرسان و کاهش آسیب حرارتی پوست
- ✦ مهار تولید پروستوگلا دین‌ها

قبل بعد



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تهران، خیابان مطهری،
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- قابل اتوکلاو
- دارای ۱۰ سطح تنظیم ضخامت برش



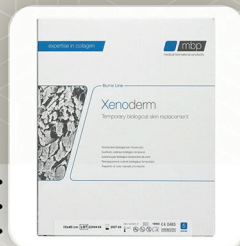
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Nanofibrous Dressing for Burn Wounds Healing

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Burns represent a significant global public health concern, resulting in an estimated 180,000 deaths annually, according to the World Health Organization. The most prevalent type of burns are second-degree burns, constituting nearly 85.4 percent of all burn cases, as reported by the National Institutes of Health (NIH). Nanofibers, as a nanoscale material, are increasingly advocated for use as wound dressings. Nanofibers with nanoscale architectures resemble the natural extracellular matrix, exhibiting superior medication loading and delivery capabilities, as well as enhanced absorption of wound exudates compared to conventional dressing types. Nanofibrous wound dressings with its unique physical and chemical properties, especially in enhancing breathability, increasing specific surface area, optimising porosity, and improving flexibility, demonstrates significant advantages in promoting wound healing, reducing the risk of infection, and improving overall healing outcomes.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

سازمان سوزش و سوختگی



Digital Twins and Complexity: A New Paradigm for Burn Care

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Burn injuries involve dynamic, interdependent physiological and systemic factors that challenge traditional, linear treatment models. Complexity science reframes burn care as a complex adaptive system, wherein patient outcomes emerge from nonlinear interactions among inflammation, perfusion, immune response, and resource availability. Digital twins—continually updated virtual replicas of individual patients or clinical environments—offer a solution by enabling “whatif” simulations *in silico*, thereby informing personalized interventions without risk to real patients.

Drawing on examples from critical care and hospital operations, sepsis-focused twins using realtime vital signs and laboratory data have achieved robust predictive accuracy (e.g., AUC ~0.8 for 14-day mortality), demonstrating the potential of living models to forecast deterioration and optimize therapy. At the systems level, hospitalwide twins have optimized bed allocation and staffing by simulating patient flow under varying demand scenarios. In burn care, emerging tools such as 3D virtual body models (“BurnCase”) have already reduced surface-area estimation errors from 20–50% to under 5%, illustrating how digital modeling can enhance diagnostic precision.

By extending these approaches, burncenter twins could simulate individualized fluid resuscitation responses, predict complications (e.g., sepsis, organ failure), and guide operatingroom scheduling during masscasualty incidents. They also support training through virtual drills and surgical rehearsals. Key challenges include ensuring highquality, interoperable data streams; addressing patient privacy and informed consent; validating model outputs through continuous verification; and integrating usercentered interfaces into clinical workflows.

We invite collaboration among clinicians, engineers, and ethicists to pilot digitaltwin initiatives in burn centers. This complexityaware strategy promises to transform burn care from reactive protocols toward proactive, personalized management—ultimately improving outcomes and resource efficiency in both routine and disasterresponse settings.



Title: Emerging Artificial Intelligence-Based Technologies for Non-Invasive Burn Depth Assessment

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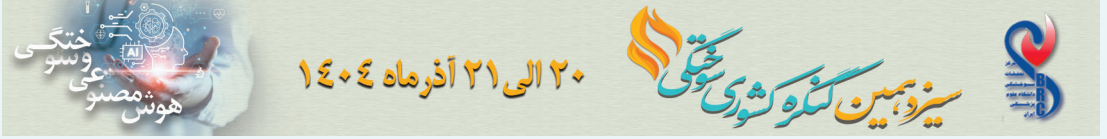
Abstract

Background

Accurate assessment of burn depth is fundamental for guiding decisions on conservative management versus early excision and grafting, predicting complications, and optimizing use of healthcare resources in burn care.[1–3] Conventional evaluation based on visual inspection, palpation, capillary refill, and anticipated healing time is inherently subjective and strongly dependent on clinician experience, which results in considerable interobserver variability and reduced accuracy, particularly in partialthickness burns. These limitations have stimulated growing interest in artificial intelligence (AI)–based, noninvasive approaches that combine advanced imaging with computational modelling to provide objective, quantitative, and reproducible burn depth assessment [1,3–5]

Methods

Recent work has explored multimodal imaging pipelines specifically tailored for AI-assisted burn evaluation. [1–5] Optical techniques such as hyperspectral and multispectral imaging capture wavelengthdependent reflectance signatures related to tissue oxygenation, hemoglobin concentration, perfusion, and the presence of necrosis, and have been evaluated in multicentre studies for depth estimation and grafting decisions. Additional modalities including laser Doppler flowmetry and ultrasound provide complementary data on microvascular perfusion, tissue thickness, oedema, and deeper structural disruption not visible at the surface. Within typical AI workflows, raw images undergo preprocessing (normalisation, denoising, illumination correction and, when required, spatial registration) before extraction of handcrafted or automatically learned features encoding colour, texture, perfusion maps, and structural patterns. Classical machine learning techniques such as support vector machines and random forests have been used for categorical depth classification and prediction of healing time or graft requirement. More recently, convolutional neural networks and transformerbased architectures have enabled endtoend learning of segmentation, depth, and severity directly from minimally processed images, sometimes augmented with temporal sequences or 3dimensional data. Integrated frameworks now link imaging outputs with electronic medical records or combine vision models with



large language models to incorporate demographic characteristics, comorbidities, injury mechanism, and clinical narratives into unified decision support systems.

Results

AI-assisted systems for burn assessment have achieved high diagnostic performance for discrimination of superficial, intermediate, and deep burns, frequently approximating or surpassing expert-level accuracy in research settings. Multimodal models that fuse optical, perfusion, and structural information are particularly effective in complex scenarios such as mixed-depth wounds and very early post-injury time points, where clinical examination alone is often misleading.[3–5] Integrated platforms embedded in electronic medical record environments can provide automated predictions of burn depth, likely need for grafting, risk of sepsis, and expected healing trajectories, while simultaneously producing structured outputs for triage, documentation, and telemedicine. Systematic reviews indicate that AI tools are increasingly being applied not only to depth assessment but also to broader tasks such as complication diagnosis, outcome prediction, and general wound-healing analysis.

At the same time, mobile and point-of-care implementations are emerging. Portable cameras and smartphone-based applications, sometimes connected to cloud or edge-based inference engines, extend specialist-level assessment to emergency departments, ambulatory clinics, and resource-limited environments. Wearable sensors and smart dressings that monitor temperature, perfusion, and biochemical markers offer longitudinal data streams that can be analysed by AI models to quantify progression, detect deterioration, and support early intervention.

Advantages and Challenges

Compared with traditional clinical assessment, AI-driven approaches provide improved objectivity, reproducibility, and speed, which may reduce diagnostic uncertainty, unnecessary biopsies, and avoidable operative procedures while helping to standardise decision-making across centres and levels of expertise.[1–3,6] Potential health system benefits include optimisation of surgical timing, shortening of hospital stay, and more selective referral to specialised burn units. Nevertheless, several barriers limit widespread implementation. Many models have been developed on relatively small, single-centre or demographically narrow datasets, raising concerns about generalisability across diverse skin phototypes, age groups, injury mechanisms, and imaging devices. Heterogeneity in acquisition protocols, device calibration, and ground truth labelling complicates external validation and comparison between studies. Workflow integration requires intuitive user interfaces, robust performance in real-world conditions, and clear procedures for quality assurance, monitoring, and model updating.

Ethical and regulatory considerations are equally central. AI systems that rely on patient images and clinical records must ensure data privacy, secure storage, and appropriate consent. Bias in medical imaging AI—arising from unbalanced datasets, technical artefacts,



or clinical practice patterns—can produce inequitable performance across demographic groups, and needs to be addressed through careful dataset curation, bias-aware development, and continuous auditing. Explainable AI techniques that provide visual or textual rationales for model outputs are increasingly emphasised to enhance transparency, support clinician trust, and meet emerging regulatory expectations.

Conclusions:

AI-based, noninvasive technologies for burn depth assessment are transitioning from proof-of-concept algorithms to clinically oriented, real-time decision support systems. By leveraging multimodal imaging, advanced machine learning and deep learning architectures, and linkage with electronic medical records and narrative clinical data, these approaches have the potential to overcome longstanding limitations of subjective examination, improve diagnostic accuracy and consistency, and enable more precise, individualised burn care. [1–4,6,7] Future priorities include the creation of large, diverse, and standardised datasets; rigorous multicentre prospective validation; development of bedside and edge computing implementations; and establishment of robust ethical and regulatory frameworks that ensure safety, fairness, and transparency. Through close collaboration between engineers, clinicians, and policymakers, AI-enabled burn assessment may become a cornerstone of next-generation reconstructive, regenerative, and critical care practice. [3,8–10]

Keywords: Artificial intelligence; burn depth assessment; multimodal imaging; hyperspectral imaging; deep learning; machine learning; explainable AI.

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۲۰ الی ۲۱ آذر ماہ ۱۴۰۴

بیروہمین کنو کشری سبجی



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The role of surgical technique in preventing scarring in acute burn surgery

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Introduction:

With the increase in the survival rate of burn patients, the quality of life of extensive burn patients after acute burn recovery has now received serious attention. The quality of surgical procedures in the acute stage of burn injury is one of the variables that can affect the quality of post-burn scars and, consequently, the patient's quality of life.

Material and Methods:

By reviewing the latest articles published in Web of Science, PubMed, and Google Scholar on acute burn surgical techniques and comparing them with the author's findings in the Burn and Reconstructive Surgery Department of Imam Reza Hospital, the measures mentioned in the result section will affect the quality of post-burn scars.

Results:

Early excision and grafting; in addition to reducing the length of hospital stay, the risk of infection in burn wounds, hospitalization costs, and mortality rates of burn patients, it also appears to have a direct effect on post-burn scar quality.

There is serious doubt that increasing the thickness of the harvested split technique skin graft beyond the standard limit (0.012 to 0.016 inches) will improve the quality of subsequent scars, and the surgeon should not add to the patient's scars at the donor site by creating deep damage in the hope of improving the quality of the scar at the site of the skin graft recipient.

In patients who cannot undergo early excision and closure due to hemodynamic instability or severe inhalation injury, or who present late, removal of epithelium formed at the margins of deep burn wounds can help improve subsequent scars. Using minimal meshing techniques and paying special attention to areas that play a more important role in the patient's function and beauty is another important point that can have a direct impact on



۲۰ الی ۲۱ آذرماه ۱۴۰۴

بیمین کنوینسیون



the quality of the scars after burn injury.

Also, continuous patient follow-up and the use of appropriate methods for scar prevention and improvement, including massage, burn pressure garments, silicone sheets and gels, intralesional corticosteroid injections, and laser therapy at the right time, can have a significant impact on improving scar quality.

Conclusions:

By carefully planning the timing of surgery, using the appropriate technique for wound coverage, paying attention to the details and subtleties of surgical technique, and following up patients for a long time, and performing the necessary interventions to prevent and improve scars at the right time, the burn surgeon can have a direct impact on the quality of post-burn scars and, consequently, the patient's quality of life.

Keywords:

Burns, surgical techniques, scar



Treatment Adherence Interventions for Burn Patients: Role of Motivational interview

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Abstract:

Optimal burn treatment requires active collaboration from the patient in the form of adherence, defined as the extent to which recommended treatments are implemented by the patient. Psychological interventions for treatment adherence among burn survivors are primarily focused on inpatient treatment, whereas comparatively little data exist on outpatient treatment, such as follow-up appointment attendance, home-based dressing changes, and at-home range-of-motion exercises. This paper examines the potential role of MI in enhancing treatment adherence among burn patients.

Method:

A review of existing literature on burn care and behavioral interventions was conducted. MI principle, including empathetic engagement, reflective listening and elicitation of patients personal goals were analyzed in the context of adherence challenges specific to the burn population.

Result:

This article will begin with a review of Motivational interviewing (MI), cover challenges burn patients encounter, and describe validated Psychological interventions before discussing specific barriers to treatment adherence with several potential applications of MI interventions and suggestions for future research. This review summarizes many of the challenges burn survivors may face as they recover from their injuries, with a specific focus on barriers to treatment adherence. Evidence based psychological interventions are summarized, and MI is introduced as a powerful intervention that may be particularly useful for addressing adherence issues across a variety of clinical settings throughout the phases of healing. MI need not compete with the existing, robust treatment approaches described above. Rather, principles inherent to the MI spirit and OARS techniques can be woven throughout patient interactions across treatment stages.

Conclusion:

Allied interdisciplinary burn treatment team members can also utilize MI principles in their work with patients. The consistent application of the MI spirit, along with MI techniques during patient interactions,

is likely to decrease reactance on the part of the patients while simultaneously connecting the patient with core values that will promote treatment adherence and holistic, values-congruent lifestyle choices.

Key words:

Motivational interview, burn, adherence, psychological interventions

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Prognostic Value of Serum and Urinary Cortisol and C-reactive Protein in ICU-admitted Burn Patients

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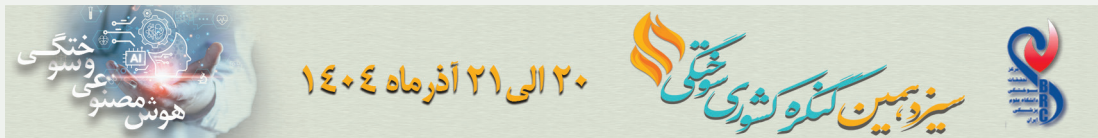
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Purpose : Burn injuries, often leading to significant morbidity and mortality, are a primary concern, especially for patients in the ICU. This study investigates the relationship between serum and urinary cortisol levels, C-reactive protein (CRP) levels, and overall survival in burn patients hospitalized in the ICU. Cortisol, a stress response marker, and CRP, an indicator of systemic inflammation, are key in burn pathophysiology.

Methods : This cross-sectional analytical study was conducted on 69 burn patients admitted to the ICU. The data collection process was thorough, with serum and urinary cortisol and CRP levels measured on days 1, 3, 5, and 7 of hospitalization. Additionally, hemoglobin, WBC, body temperature, pulse rate, SO₂, vasopressor use, Glasgow Coma Scale, blood culture, and SOFA score were meticulously recorded. The diagnostic criteria for sepsis included positive tissue or blood culture for bacteria or fungi and changes in consciousness. Data were analyzed using SPSS version 26.

Results : Based on the findings, the mean serum cortisol level was significantly elevated in patients with sepsis and demonstrated a notable decline on days one, three, and five. In contrast, urinary cortisol levels did not differ significantly between the sepsis and non-sepsis groups. The mean CRP level was higher in septic patients, with an increasing trend strongly associated with sepsis. Additionally, changes in CRP levels were correlated with the total body surface area (TBSA) affected by burns. The mean Glasgow Coma Scale (GCS) score was lower in septic patients, and a statistically significant association was observed with the trend of GCS changes over time.

Conclusion : Serum and urinary cortisol and C-reactive protein levels can be significant biomarkers for predicting burn patient outcomes. Integrating these biomarkers into clinical practice can enhance management strategies and improve prognostic accuracy for burn patients admitted to the intensive care unit.



Evaluation of Intravenous Tranexamic Acid on Bleeding During Burn Surgery: A Double-Blinded Clinical Trial

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Purpose : Early excision and grafting are crucial for reducing infection and sepsis in severe burn patients. However, these procedures often lead to significant blood loss, frequently necessitating large blood transfusions. This study aimed to evaluate the effect of Tranexamic acid (TXA) on bleeding during burn surgery.

Methods : This was a single-center, prospective, double-blinded, parallel-arm superiority randomized placebo-controlled trial. Patients with severe burns (>20% TBSA) undergoing wound excision and grafting were randomly assigned to either the interventional (TXA) or control (placebo) group. TXA and placebo groups received intravenous injections of 10 mg/kg TXA and 10 ml/kg normal saline, respectively, preoperatively. The primary outcome was blood loss volume per square centimeter of excised burn area. Secondary outcomes included total blood loss, postoperative hemoglobin, intraoperative fluid requirements, blood transfusion rates, infection, graft take, and length of hospitalization (LOH).

Results : Forty-seven TXA patients were matched with 47 control patients. Baseline characteristics were similar, including gender (51.06% TXA vs. 53.19% control males, $p=0.836$), age (39.36 ± 13.23 vs. 40.17 ± 13.23 years, $p=0.634$), and %TBSA burned (45.62 ± 15.46 vs. 43.53 ± 15.94 , $p=0.384$). The placebo group had significantly higher average blood loss, total blood volume received, and intraoperative fluid requirements compared to the TXA group ($p < 0.001$). TXA also significantly reduced average surgery duration. Patients receiving TXA had significantly lower mean hematocrit levels 24 hours post-surgery compared to the control group ($P=0.024$). However, no significant difference was observed in mean hematocrit levels between the groups at the beginning or immediately after surgery.

Conclusion : Intravenous TXA effectively reduced the average duration of surgery, the volume of blood received intraoperatively, and blood loss per unit of excised burn area in severe burn patients.



Study and comparison of the results of amniotic membrane grafting with mupirocin dressing in patients with acute burns over 14 years of age referred to Shahid Motahari Educational and Medical Center in Tehran from 2022 to 2024

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Purpose : Burn injuries are among the most critical traumatic conditions requiring prompt and effective treatment. This study investigates and compares the clinical outcomes of using amniotic membrane grafting versus mupirocin dressing in patients over 14 years of age with acute burns. The research is designed as a descriptive cross-sectional study conducted at Shahid Motahari Hospital in Tehran between 2022 and 2024. Data were collected from 169 patient files and follow-up calls. Findings are expected to demonstrate the efficacy of amniotic membranes in reducing inflammation, pain, infection rates, and healing time, compared to conventional mupirocin dressings. The goal is to assess both treatment outcomes and their relevance to patient variables such as age, gender, and type of burn.

Methods : This descriptive cross-sectional study was conducted between 2022 and 2024 at Shahid Motahari Hospital, Tehran. A total of 169 patients above 14 years of age with acute burn injuries were included. Data were collected from medical records and patient follow-ups. Variables such as age, gender, burn severity, and treatment method were analyzed.

Results : Preliminary observations indicate that the group treated with amniotic membrane experienced faster epithelialization, lower infection rates, and reduced pain compared to those treated with mupirocin. Full statistical results will be presented upon study completion.

Conclusion : The use of amniotic membranes appears promising in the treatment of acute burns. When compared with mupirocin dressings, amnion may provide superior healing outcomes. Further studies with larger sample sizes and longer follow-ups are recommended.

Investigation Impact of PVA nanofibers, collagen-coated, containing the conditioned medium of Adipose mesenchymal stem cells(hA-MSCs) in third-degree burn wound healing

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Purpose : Conditioned medium (CM) extracted from human adipose mesenchymal stem cells (hA-MSCs) contains abundant amounts of various growth factors and cytokines, boosts cell viability, proliferation, migration, immunomodulation, and promotes wound healing. However, for practical applications, a biodegradable supporting material is required to maintain CM in the wound area. polyvinyl alcohol (PVA) nanofibers coated with collagen (PVA-Col/CM) are suitable carriers due to their biocompatibility and biodegradability.

Methods : In this study, CM was derived from cultured hA-MSCs and identified twelve growth factors and cytokines with dominant expression (TNF- α , VEGF, EGF, FGF-2, IGF-1, HGF, PGE2, IL-6, IL-10, IL-1ra, IDO, and HLA-G) that are known to contribute in wound healing. The PVA nanofiber scaffolds were developed to evaluate the relevant factors and conditions in terms of mechanical properties to enhance burn wound regeneration. For this purpose, different concentrations (0.5–1 % w/v) of Col were initially coated onto PVA nanofibers to optimize the suitable carrier due to swelling, biodegradation behavior, and mechanical properties.

Results : Adding 1 % w/v Col resulted in optimal mechanical properties and biodegradability. Next, different concentrations (10, 20, and 30 mg/ml) of CM were added to Col 1% to prepare the PVA-Col/CM scaffold. The PVA-Col/CM (30 mg/ml) was selected as the optimum scaffold for burn wound healing, considering cell viability and cytocompatibility. Moreover, implantation of PVA-Col/CM on burn wounds in rats showed improvement in wound closure, and histopathological examination showed that the PVA-Col/CM scaffold accelerated burn wound healing through anti-inflammatory activities, more abundant fibroblast cells, more angiogenesis and collagen deposition, greater re-epithelialization and dermal remodeling of collagen in the wound area.

Conclusion : Altogether, these findings highlight the therapeutic potential of PVA-Col/CM (30 mg/mL) scaffold as an effective treatment for burn wound healing.



Bioengineered PEG/Gel Hydrogels with ZnO and Platelet-Rich Plasma for Accelerated Wound Repair

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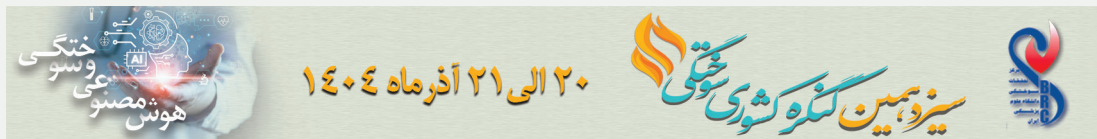
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Purpose : Wound healing is a complex and dynamic biological process involving inflammation, tissue regeneration, and remodeling. Full-thickness wounds, which penetrate both the epidermis and dermis, present a significant clinical challenge due to their slow healing and high susceptibility to infection. Conventional wound dressings often lack the biological cues and structural support necessary for effective tissue regeneration. Consequently, there is increasing interest in skin tissue engineering approaches that actively promote healing. In this study, we investigated the biological and physical properties of polyethylene glycol/gelatin (PEG/Gel) hydrogels incorporated with zinc oxide (ZnO) nanoparticles and platelet-rich plasma (PRP) for the treatment of full-thickness wounds.

Methods : The hydrogels were characterized using MTT assays, scanning electron microscopy (SEM), Fourier-transform infrared spectroscopy (FTIR), tensile testing, water contact angle measurements, swelling behavior, and biodegradability assessments. Their wound-healing efficacy was further evaluated in an in vivo animal model.

Results : FTIR analysis confirmed the successful incorporation of PEG, gelatin, ZnO, and PRP into the hydrogel matrix without detectable impurities. Biodegradability tests revealed that PEG/Gel/ZnO hydrogels with 1% and 2% PRP exhibited the most rapid degradation rates. Mechanical testing showed that ZnO enhanced the tensile strength of the hydrogels, while the addition of PRP led to a decrease in mechanical strength. MTT assays demonstrated that the PEG/Gel/ZnO/1%PRP formulation achieved the highest cell viability at 24 and 48 hours. SEM imaging revealed a porous structure conducive to cell adhesion and proliferation, supporting enhanced wound healing. Histological analysis confirmed that the addition of 1% PRP significantly accelerated the healing process, resulting in near-complete skin regeneration by day 14.

Conclusion : These findings suggest that PEG/Gel hydrogels containing ZnO nanoparticles and PRP offer promising potential as advanced wound dressings for full-thickness wound management.



Controlled Release of Growth Factors from PRP-Encapsulated Hydrogels for Accelerated Wound Healing

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Purpose : This study investigates the use of platelet-rich plasma (PRP) encapsulated in polyvinyl alcohol (PVA) hydrogel containing zinc oxide (ZnO) nanoparticles for the treatment of full-thickness wounds. PRP, rich in growth factors such as VEGF, EGF, PDGF, TGF- β , and IGF, plays a vital role in promoting tissue regeneration. However, its rapid degradation limits clinical efficacy. Our objective was to enhance the therapeutic longevity of PRP and improve its storage and application for chronic and deep wound healing. To address this, freeze-dried PRP (FD-PRP) was encapsulated within a PVA/ZnO hydrogel to achieve controlled, sustained release of growth factors.

Methods : In this research, Hydrogels were fabricated and characterized using by cytotoxicity assays, FTIR spectroscopy, morphological characterization, drug release profiling, mechanical testing, and histopathological evaluation were performed.

Results : Results demonstrated that hydrogels containing 1% PRP exhibited the highest cell viability and proliferation, with a porous structure favorable for cell infiltration and angiogenesis. The incorporation of ZnO nanoparticles improved biodegradability and provided anti-inflammatory and antimicrobial effects, further supporting the healing process. In vivo pathological assessments revealed that the PVA/ZnO/1% PRP hydrogel group showed enhanced wound closure, reduced inflammation, organized granulation tissue, and re-epithelialization by days 3, 7, and 14. MTT assay results corroborated the superior biocompatibility and cell proliferation in this group.

Conclusion : Overall, the combination of FD-PRP with PVA hydrogel and ZnO nanoparticles offers a promising platform for the treatment of chronic, deep, and non-healing wounds, serving as an innovative and effective wound care strategy.



Fortified Electrospun Collagen Utilizing Biocompatible poly Glycerol Sebacate prepolymer(PGSp) and Zink Oxide Nanoparticles(ZnO NPs) for Wound Healing: physical, Biological and Animal Studies

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Purpose : Collagen, a naturally occurring fibrous protein, is a potential resource of biological materials for tissue engineering and regenerative medicine because it is structurally biocompatible, has low immunogenicity, is biodegradable, and is biomimetic. Numerous studies have documented in the literature how Collagen nanofibers exhibit limited cell adhesion, poor viscosity, and no internal fibril structure. The biomedical industry is using Poly Glycerol Sebacate prepolymer(PGSp), a biodegradable and biocompatible polyester with high adhesion and a very viscous appearance, more often.

Methods : Here, unique electrospun Collagen/PGSp/ZnO/NPs blend nanofibers for skin tissue application were developed and described with varied PGSp percent. Additionally, when ternary blends of Collagen, PGSp, and Zink Oxide Nanoparticles (ZnO NPs) are used, the antibacterial properties of the scaffolds are improved. The bead-free electrospun nanofibers were produced by raising the PGSp concentration to 30%w/w. SEM, EDS, tensile, MTT, FTIR, SDS-page, swelling test, contact-angle, antimicrobial, biodegradation, XRD, and cell attachment procedures were used to characterize the crosslinked nanofibers. In this study, 32 Albino Wistar rats weighing 200-250 g were used.

Results : The ternary blend nanofibers with a weight ratio of Collagen/PGSp 30%/ZnONPs 1% had higher stress/strain strength (0.25 mm/mm), porosity (563), cell survival, swelling, antimicrobial, cell adherent, and degradation time. Moreover, histological evaluation by H&E staining and Masson staining showed that after applying PGS 30% at days 7 and 14, tissue structure could improve in the treated rats compared to other groups.

Conclusion : Moreover, after applying for wound healing in diabetic rats, Collagen/PGSp 30%/ could be shown to improve wound healing significantly compared to other groups. Collagen/PGSp30%+ZnONPs nanofiber outperformed other nanofibrous scaffolds in terms of mechanical characteristics, cellular function and wound healing. For use in skin tissue engineering applications, Collagen/PGSp30%+ZnONPs nanofiber can be viewed as a potentially biocompatible scaffold.



Acellular kidney capsule: A 3D scaffold for skin regeneration and repair

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Purpose : In recent years, the use of biomimetic scaffolds has emerged as a promising strategy in tissue engineering, particularly for skin regeneration. While synthetic polymer-based scaffolds have shown rapid advancement, they often fail to fully replicate the native extracellular matrix (ECM) environment and exhibit limitations in biocompatibility, immunogenicity, and mechanical performance.

Methods : In this study, decellularized sheep kidney capsule tissue was investigated as a potential three-dimensional scaffold for skin tissue engineering. Decellularization was performed using Triton X-100 and sodium dodecyl sulfate (SDS) at various concentrations. The scaffolds were evaluated through DNA quantification, histological analysis, mechanical testing, attenuated total reflection Fourier-transform infrared spectroscopy (ATR-FTIR), scanning electron microscopy (SEM), and assessments of biocompatibility and hemocompatibility.

Results : The decellularized scaffolds preserved the three-dimensional ECM structure and exhibited favorable hydrophilic properties. Among the tested conditions, the scaffold treated with 0.5% SDS demonstrated the most effective decellularization, lowest residual DNA content, and superior biocompatibility and hemocompatibility.

Conclusion : Decellularized kidney capsule, particularly when processed with 0.5% SDS, offers a structurally intact, biocompatible scaffold resembling native ECM. These properties make it a promising candidate for use in skin regeneration and other tissue engineering applications.



Antibacterial Effect of Hydroxypropyl Methylcellulose Gel Containing Bacteriophages Against *Pseudomonas aeruginosa* Isolated from Burn Patients

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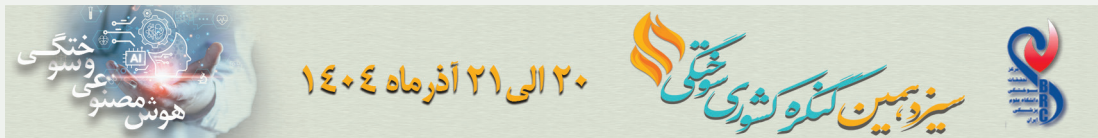
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Purpose : The emergence of multidrug-resistant bacteria such as *Pseudomonas aeruginosa* and *Staphylococcus aureus* poses significant challenges to infection control. Green synthesis of metal nanoparticles offers an eco-friendly approach with potent antimicrobial and anti-biofilm properties. This study investigates the antibacterial and anti-biofilm activities of *Punica granatum*-based Cu/Ag/Zn nanoparticles against these pathogens.

Methods : *Punica granatum* extract was used for the green synthesis of Cu, Ag, and Zn nanoparticles, which were characterized via UV-vis, TEM, SEM, FTIR, and XRD analyses. The antibacterial activity was assessed by agar well diffusion, MIC, and MBC methods. Anti-biofilm efficacy was evaluated using crystal violet staining and biofilm eradication assays against *P. aeruginosa* and *S. aureus*.

Results : The nanoparticles demonstrated significant broad-spectrum antibacterial effects, inhibiting growth of both bacteria effectively. They showed notable ability to prevent biofilm formation and disrupt existing biofilms. The combined Cu/Ag/Zn nanoparticles exhibited enhanced antimicrobial activity compared to individual metal nanoparticles, attributed to synergistic effects

Conclusion : *Punica granatum*-synthesized Cu/Ag/Zn nanoparticles possess potent antibacterial and anti-biofilm properties against *P. aeruginosa* and *S. aureus*. These findings suggest their potential as effective alternative agents in combating resistant bacterial infections and biofilm-related complications.



Inhibitory Effects of Postbiotic Compounds Derived from Lactobacillus Strains on Biofilm Formation by Pseudomonas aeruginosa Isolated from Burn Wounds

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Purpose : Pseudomonas aeruginosa is a leading cause of nosocomial infections in burn patients, largely due to its robust biofilm-forming ability, which contributes to antibiotic resistance and worsens clinical outcomes. Novel non-antibiotic strategies, including probiotics and postbiotics, have gained attention for their potential to disrupt biofilm formation. This study aimed to evaluate the anti-biofilm effects of postbiotic supernatants (cell-free supernatants; CFS) derived from various Lactobacillus strains on clinical isolates of P. aeruginosa obtained from burn wound infections.

Methods : forming potential using standard phenotypic assays. CFS were prepared from different Lactobacillus strains cultivated in MRS broth and centrifuged to remove bacterial cells. The anti-biofilm activity of each CFS was quantified using the microtiter plate crystal violet staining method.

Results : All tested CFS demonstrated measurable inhibitory effects on biofilm formation, though the degree varied by strain. Notably, CFS from Lactobacillus plantarum and Lactobacillus acidophilus showed the most significant biofilm inhibition (up to 43.3%) compared to controls ($p < 0.001$). While inhibition was substantial, complete suppression of biofilm biomass was not achieved. Importantly, no statistically significant differences were observed between different concentrations of CFS, suggesting a saturation effect.

Conclusion : Postbiotic compounds from specific Lactobacillus strains effectively reduced P. aeruginosa biofilm formation in vitro, highlighting their potential as complementary or alternative therapeutic agents in burn wound management. These findings support further investigation into postbiotic-based strategies to combat multidrug-resistant pathogens in clinical settings, especially where conventional antibiotics may fail.



Comparison of the Effects of Silver Nanoparticle Ointment, Mupirocin, and A. yukrohuma Extract Ointment on Histopathological Factors and Wound Size in Burn and Surgical Wounds in Rats

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Purpose : This experimental study aimed to evaluate the therapeutic effects of ointments containing silver nanoparticles and A. yukrohuma plant extract on the healing process of burn and surgical wounds in a rat model. A total of 72 male Wistar rats were randomly divided into 12 groups (7 burn wound groups and 5 surgical wound groups) and treated with various ointments for 21 days. Treatment groups included silver sulfadiazine (SSD), mupirocin, 2% and 5% silver nanoparticles (Nano 2% and Nano 5%), 2% and 5% A. yukrohuma extract (AE 2% and AE 5%), base ointment, and a no-treatment control group.

Methods : Wound size was measured on days 3, 7, 14, and 21 using ImageJ software. Histopathological samples from the wound edges were collected on days 7 and 21. On day 7, parameters such as epithelialization, granulation, vascularization, fibroblast proliferation, and



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inflammatory cell infiltration were assessed. On day 21, additional features including collagen density and thickness, collagen orientation, hair follicle presence, and nerve regeneration were examined.

Results : The results showed that 5% silver nanoparticles ointment (Nano 5%) significantly improved key histopathological features, especially in the structure, density and organization of collagen. Nano 2% also showed favorable healing effects compared to other treatments. Also, the wound size in the Nano 2% group was significantly different from the other groups but not significantly different from the SSD group.

Conclusion : In conclusion, silver nanoparticle-based ointments - especially at 5% concentration - showed effective wound healing properties, indicating their potential as promising agents for enhancing tissue regeneration in burn wound care. Nano 2% also competed closely with standard burn ointment.



Comparison of the effectiveness of disinfection of ICU environments for burn patients using fogging and UV radiation: An experimental study

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Purpose : Burn patients are susceptible to hospital-acquired infections, especially in the intensive care unit, due to extensive skin destruction and defects in the body's natural defense barrier. Infections caused by resistant microorganisms lead to increased mortality and length of stay. Environmental contamination control in the ICU of burn patients is of great importance, and various methods of environmental disinfection, including chemical fogging and ultraviolet radiation, are used. Despite their widespread use, the comparison of the effectiveness of these two methods in the ICU environment of burn patients has not yet been fully investigated.

Methods : This experimental-cross-sectional study was conducted on 36 critically ill patients admitted to the ICU of Zare Medical Center in Sari. The inclusion criteria were patients with a burn percentage of 20 to 40%, no inhalation burns, and ages between 18 and 65 years. The patients were divided into two equal groups. The first group received environmental disinfection using a fogger and the second group received a UV light device. The results of the culture and microbial load in the two groups were analyzed using statistical tests.

Results : In the fogging group, 14 samples were positive on the second day and this number decreased to 12 samples on the seventh day. Although this decrease indicates a partial effectiveness of the fogging, it was not statistically significant. In the UV radiation group, 10 samples were reported positive on the second day and a significant decrease was reached to 3 samples on the seventh day. (P:0.008) Also, the microbial load of positive samples in this group decreased significantly.

Conclusion : The use of UV radiation is recommended as a more effective method than fogging for disinfection of the ICU environment of burn patients. This method can reduce nosocomial infections and improve treatment outcomes. Future studies with larger sample sizes and longer follow-up periods are needed to investigate long-term effects.

A case of deep skin lesions resembling second-degree burns after a one-day trip in a forest environment with possible bites: A case report of a 67-year-old patient

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Purpose : Burn-like skin lesions can occur from arthropod bites or exposure to natural toxins. These lesions usually resolve with supportive care. A 67-year-old female patient presented with red, painful, non-blistering lesions on her left armpit, both shoulders, and upper back after a one-day trip to a forested area. The lesions appeared to be second-degree burns. Laser Doppler evaluation was performed to assess blood supply, and after two evaluations four days apart, the deeper affected areas underwent excision and skin grafting. Similar cases of forest insect bites with similar skin lesions have been reported in the medical literature. This report emphasizes the importance of a detailed environmental history and expert evaluation.

Methods : A 67-year-old female patient with no history of underlying disease presented with red, warm, and painful lesions on the left axilla, shoulders, and upper back after a one-day trip to a forested area. The lesions were non-vesicular but appeared to be deep second-degree burns. The patient had no history of exposure to heat or chemicals and reported no systemic symptoms such as fever or chills. Areas of deeper damage were excised of necrotic tissue and skin grafts were performed. Supportive care included moist dressings and pain control. Oral antibiotics were prescribed to prevent secondary infection.

Results : Accurate diagnosis and a complete environmental history are essential to differentiate these lesions from thermal or chemical burns, skin infections, and inflammatory diseases.

Conclusion : In elderly patients with unusual skin lesions after exposure to a forest environment, the possibility of arthropod bites or exposure to natural toxins should be considered. Expert evaluation and timely treatment, including the use of methods such as laser Doppler and excision and grafting if necessary, can help improve outcomes.



Effect of probiotic administration in Inflammatory Responses of thermal burns

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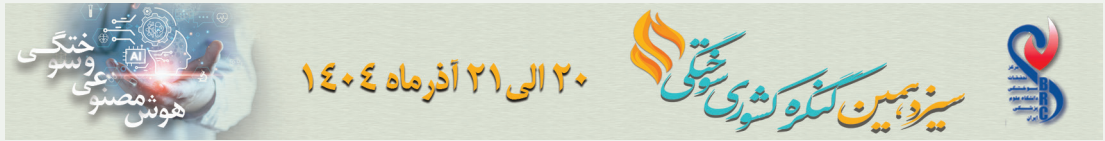
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Purpose : It is possible to damage the natural intestinal barrier following severe burn injuries. Positive effects of oral probiotics on either innate immune system or intestinal epithelial layer are proven. This research aimed to evaluate role of probiotics on plasma inflammatory changes and bacterial colonization in burned wound after high grade thermal trauma

Methods : This double-blinded randomized controlled trial was conducted on 80 patients with a burn percentage of 20-50%. Patients were allocated to two groups based on four blocks randomization model. Intervention and control groups received daily LactoCare and placebo capsules respectively for 14 consecutive days. Obtaining demographic data, burn and gastrointestinal symptoms were registered by filling out a questionnaire. Additionally, measuring plasma levels of highly sensitive C-reactive protein(hs-CRP), IgA, absolute neutrophilic and lymphocytic count were performed cumulatively four times prior to and after the intervention.

Results : Considering eligible data, following the study period analysis showed significant mitigation of inflammatory status in probiotic receivers. The hs-CRP reduced obviously following probiotic (21.38 ± 44.45) consumption compared with placebo (-36.36 ± 79.03) intake ($P < 0.001$). Also, the plasma level of IgA significantly decreased in the intervention group (0.88 ± 0.65) than in the control group (0.79 ± 0.18) ($P < 0.001$). Wound cultures showed no significant difference between groups although the incidence rate of bacterial colonization was slightly lower after using probiotic ($P = 0.159$). Regarding wound healing, data illustrated probiotics could accelerate the repair of the wound after 14 days of regular consumption ($P < 0.001$).

Conclusion : Probiotics have advantages for mitigation of inflammation and wound healing following severe thermal burn injuries



Prevention and treatment of scars with the help of artificial intelligence in burn patients

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Purpose : Burns are serious skin injuries that can significantly affect the quality of life of individuals. In the past, advanced burn treatment was limited to traditional methods such as dressings and surgery; however, with scientific and technological advances, burn treatment has undergone a dramatic transformation. In this study, we investigated the prevention and treatment of scars with the help of artificial intelligence in burn patients.

Methods : The present study aimed to review the performance of artificial intelligence in predicting survival in burn patients. The search for references for this review article was conducted in the databases PubMed, Scopus, Web of Science ISI, and Google Scholar. The search in these databases was conducted using the keywords: artificial intelligence, scar prevention, and burn. Among the studies published between 2010 and 2024, 40 articles were extracted, and after review, 20 articles were finally reviewed.

Results : The use of artificial intelligence and big data analytics in burn treatment is increasing. This technology can help diagnose and assess wounds and, by identifying wound patterns, help doctors predict possible complications. Traditional treatments such as skin grafts and various dressings only partially solved the problem of burn patients and often required a long time to heal. But new innovations, such as cell therapy, skin grafting and the use of robots, have enabled faster, more precise and effective skin regeneration. These technologies not only increase the speed of healing, but also reduce side effects and long-term risks and help patients return to normal life faster.

Conclusion : Throughout the course of human growth and evolution, technology has always come to her aid and provided many solutions to her problems.



Deep Learning for Burn Severity Assessment: A Comparative Study of EfficientNet and ResNet50

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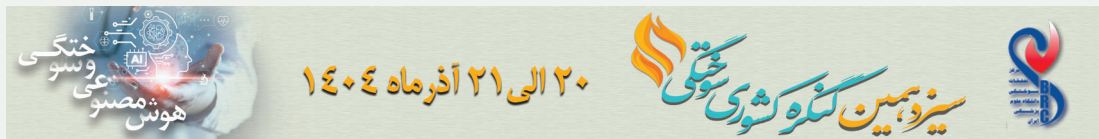
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Purpose : Accurate and timely classification of burn injury severity is crucial for effective medical intervention. Despite the growing adoption of convolutional neural networks (CNNs) in medical image analysis, their application to burn degree prediction is often hindered by limited open datasets and class imbalance. This study addresses these challenges by investigating the performance of two prominent deep learning architectures, ResNet50 and EfficientNet, on a newly curated and publicly available dataset of skin burn images. Notably, EfficientNet's efficacy in burn classification has not been previously explored in the literature.

Methods : We compiled and open-sourced a dataset comprising 1,333 skin burn images, meticulously labeled into three degrees: first-degree (532 images), second-degree (488 images), and third-degree (313 images). To mitigate the impact of class imbalance, balanced accuracy was employed as a primary evaluation metric. Both ResNet50 and EfficientNet models were trained and assessed using standard image preprocessing and augmentation techniques. Their performance was rigorously compared across several metrics: test accuracy, balanced accuracy, training time, inference time, and parameter count.

Results : ResNet50 demonstrated superior classification performance, achieving a test accuracy of 75.00% and a balanced accuracy of 74.14%, surpassing EfficientNet's respective scores of 68.00% and 66.87%. Conversely, EfficientNet exhibited notable computational efficiency, requiring significantly less training time (263.22 seconds versus 392.62 seconds for ResNet50) and possessing a substantially lower parameter count (11.62 million versus 24.62 million). ResNet50 showed a marginal advantage in inference time (1.28 seconds compared to 1.58 seconds for EfficientNet).

Conclusion : This research indicates that ResNet50 offers higher accuracy for burn degree classification, particularly on small, imbalanced datasets. In contrast, EfficientNet presents a compelling alternative for scenarios prioritizing faster training and reduced model complexity. The publicly available dataset and source code are intended to foster further research, promote reproducibility, and advance automated burn assessment capabilities.



Robustness of Machine Learning Models for Burn-Depth Classification Under Image Degradations

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Purpose : Burn-depth assessment is critical for effective treatment. Machine learning (ML) models, including Support Vector Machines (SVM), Random Forest, K-Nearest Neighbors (KNN), and Extreme Gradient Boosting (XGBoost), have shown promise in automating burn-depth classification, offering objective alternatives to subjective visual assessments.

Methods : We utilized the Skin Burn Dataset, comprising 1,221 high-quality images labeled as first-degree (532 images), second-degree (488 images), and third-degree (201 images) burns. Images were split into 70% training, 20% validation, and 10% test sets, resized to 224×224 pixels, and augmented with random flips, rotations, and contrast adjustments. We applied three noise models to simulate real-world degradations: Gaussian noise ($\sigma \in [5,30]$), Poisson noise (modeling low-light conditions), and speckle noise (Rayleigh distribution). Four ML models—SVM, Random Forest, KNN, and XGBoost—were trained on the dataset. Performance was evaluated using precision, recall, and accuracy on both clean and degraded test sets, implemented in Python with NumPy and Scikit-learn, ensuring reproducibility with fixed random seeds.

Results : On clean images, Random Forest achieved the highest performance among ML models, with a precision of 0.61, a recall of 0.60, and an accuracy of 0.60, followed by XGBoost (0.56, 0.57, 0.57), KNN (0.61, 0.53, 0.53), and SVM (0.49, 0.49, 0.49). Under Gaussian noise, Random Forest maintained moderate performance (precision: 0.55, recall: 0.48, accuracy: 0.48), while SVM, KNN, and XGBoost showed significant declines, with accuracies dropping to 0.45, 0.45, and 0.40, respectively. Poisson noise further degraded performance, with Random Forest at 0.50 accuracy and others below 0.50. Speckle noise yielded slightly better results, with Random Forest at 0.57 accuracy, while SVM, KNN, and XGBoost remained near 0.50–0.51.

Conclusion : This study demonstrates that traditional ML models, particularly Random Forest, offer moderate performance for burn-depth classification on clean images but struggle under simulated real-world degradations like Gaussian, Poisson, and speckle noise.



Prediction of Sepsis in Burn Patients Using Machine Learning Technique

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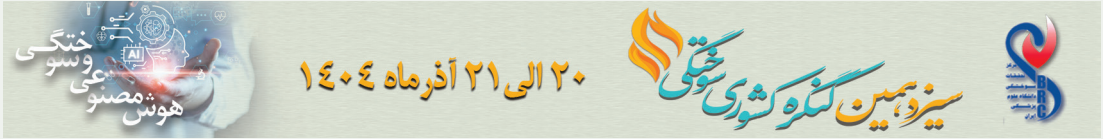
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Purpose : Sepsis is one of the most common and life-threatening complications among burn patients. Delayed diagnosis can lead to increased mortality, prolonged hospitalization, and elevated healthcare costs. Due to the complexity of clinical manifestations and the lack of definitive diagnostic criteria, early prediction of sepsis in burn patients holds critical importance. This study aimed to develop and evaluate machine learning models for predicting sepsis and to identify key contributing factors.

Methods : Clinical data were collected from burn patients admitted to Amir al-Momenin Burn Hospital in Shiraz, Iran. After data preprocessing and feature selection, six machine learning algorithms—including Decision Tree, Neural Network, Support Vector Machine, Random Forest, Naive Bayes, and Logistic Regression—were employed to build predictive models. Hyperparameter tuning was performed using iterative optimization techniques. Model performance was assessed using accuracy, sensitivity, specificity, F1-score, and the area under the ROC curve (AUC).

Results : The Random Forest algorithm demonstrated the highest performance, achieving an accuracy of 92.20%, precision of 93.32%, sensitivity of 86.89%, specificity of 95.67%, F1-score of 89.73%, and an AUC of 0.95. The optimal hyperparameters included 100 trees, a maximum depth of 10, and confidence-based voting. The most influential predictors for sepsis were identified as procalcitonin, burn percentage, hemoglobin, blood urea nitrogen, white blood cell count, platelet count, creatinine, prothrombin time, wound culture, cause of burn, inhalation injury, fever, chest physiotherapy, urine output, intubation, time to intubation, epinephrine administration, and antibiotic therapy.

Conclusion : The findings of this study suggest that machine learning models—particularly the Random Forest algorithm—can serve as effective tools for the early prediction of sepsis in burn patients.



Survival Prediction in Burn Patients Using Machine Learning Techniques

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Purpose : Burn injuries, resulting from exposure to heat, electricity, chemicals, friction, sunlight, or radiation, constitute significant trauma affecting the skin and underlying tissues. Early diagnosis and identification of survival-related risk factors are essential in the clinical management of burn patients. Developing predictive models can play a vital role in reducing mortality rates among these patients. This study aims to develop a machine learning-based predictive model for estimating the survival of burn patients, using a dataset comprising both survivors and non-survivors.

Methods : This retrospective cross-sectional study employed a descriptive-analytical design, following the CRISP-DM methodology. The dataset consisted of 550 patients admitted with third-degree burns to Amir-al-Momenin Burn Center between 2021 and 2022.

Results : Among the algorithms evaluated, the Artificial Neural Network exhibited the highest performance, achieving an accuracy of 98.38%, precision of 98.89%, recall of 98.08%, F1-score of 98.45%, sensitivity of 98.08%, specificity of 98.70%, and an AUC of 0.993. The optimal hyper parameters for the ANN included one hidden layer with three neurons, 200 training iterations, a learning rate of 0.01, and a momentum coefficient of 0.9. Out of the 69 features initially collected, 46 were identified as statistically significant using p-value analysis. The top ten influential features included chest physiotherapy, coagulation function test on day two (Ptt2), intubation time, liver enzyme test (SGPT3), gender, liver enzyme test (SGOT2), tissue damage marker (LDH3), blood culture, coagulation test on day three (Ptt3), and wound culture.

Conclusion : The findings of this study demonstrate that machine learning algorithms, particularly the Artificial Neural Network, can effectively predict survival outcomes in burn patients.



From Models to Automated Pumps: Computer-Aided Fluid Resuscitation in Burn patients

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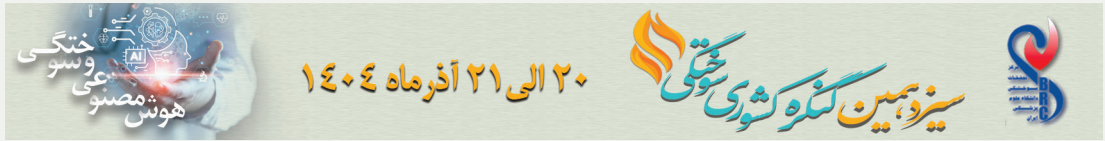
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Purpose : Fluid resuscitation is recognized as the most crucial therapeutic intervention following severe burns, particularly in acute phase. Studies have examined the efficacy of individualized fluid resuscitation, which consider not only the total body surface area (TBSA) affected but also patient-specific factors, including age and comorbidities. Given the extensive history of efforts to automate fluid resuscitation (reducing human errors) and recent advancements in clinical decision support systems, we aim to review existing studies, focusing on implications for future research.

Methods : We searched PubMed, Google Scholar, and IEEE databases for English papers using a computer-aided technique to develop models or decision support systems for burn resuscitation. The screening process was conducted by two independent reviewers. Forward and backward reference checking was employed to obtain all the relevant papers. Due to a lack of heterogeneity in methods and population, we qualitatively synthesized the methods and results of each paper.

Results : Our final screening process yielded seven studies evaluating computational approaches to fluid resuscitation in burn patients. Included studies encompassed simulated cases, retrospective human data (n=233), animal models (11 canines, 21 sheep), and small clinical cohorts (n=37). Techniques included fuzzy logic, physics-based volume modeling, dynamic infusion algorithms, and closed-loop control systems. Clinical decision support tools were also assessed using both real and synthetic data. Overall, computational methods demonstrated improved accuracy, reduced fluid volumes, decreased overload risk, and more consistent achievement of urine output targets.

Conclusion : These findings highlight the potential for intelligent fluid resuscitation to limit overresuscitation, and ultimately improve outcomes. Future research must enhance these systems to be user-friendly, adaptive, and clinically precise. Key areas include integrating patient data (e.g., hemodynamics, lab results), refining models for resuscitation phases, and validating them in clinical settings. These systems should support inexperienced staff and serve as research platforms for new protocols and diverse patient groups.



Quantifying Burn Wound Healing Using Gray-Level Co-Occurrence Matrix Analysis: An Exploratory Study

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Purpose : Given the critical need for automatic and objective methods to assess burn wound healing, this study focused on the radiomics extracted from successive burn wound images. By correlating alterations of these features with the wound status, we aimed to identify distinct features that can effectively differentiate between healing and non-healing burn wounds.

Methods : A total of 21 gray-level co-occurrence matrix (GLCM)-based texture features and six first-order statistics were extracted from 270 wound images of 33 patients with grade II and III burns. The images were captured at three time points using a smartphone camera. A physician manually labeled the wound images as either healing or non-healing at the third visit. The extracted radiomics from the successive images were compared intra and inter-groups to evaluate the statistical significance ($p < 0.05$). GLCM-based radiomics of contrast, cluster prominence, dissimilarity, energy, entropy, homogeneity, maximum probability, sum entropy, difference variance, difference entropy, information measure of correlation I, inverse difference, inverse difference normalized, and statistical features of kurtosis and skewness varied significantly between the healed and non-healed burned wounds groups.

Results : We found statistically significant differences between some of the extracted features, as follows: energy, homogeneity, maximum probability, inverse difference, inverse difference normalized, kurtosis, and skewness, significantly increased as the wound healing process progressed. Conversely, other texture features, including contrast, cluster prominence, dissimilarity, entropy, sum entropy, difference variance, difference entropy, information measure of correlation I, and entropy M, significantly decreased with the progress of wound healing. These trends were consistently observed in images of improving wounds, while the opposite patterns were evident in images of deteriorating wounds.

Conclusion : The findings highlighted the feasibility of quantitative approaches based on extracted radiomics from burn wound images in assessing burn wound healing. These features could aid clinicians in evaluating responses to treatment, optimizing treatment plans,



enhancing treatment quality, and elevating patient satisfaction.

Title:

Machine Learning Frameworks for Predicting Hospital Length of Stay and Secondary Complications in Burn Patients: A Systematic Review

Subject:

کاربرد هوش مصنوعی و کلان داده ها در پیشگیری، درمان و بازتوانی

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Abstract Original Research

Background and Objective: Burn injuries represent a significant clinical challenge, associated not only with high mortality but also with prolonged hospitalization and the risk of secondary complications (e.g., infection or organ failure). Accurate prediction of both length of stay and complication risk can inform optimal allocation of hospital resources, expedite clinical decision-making, and enhance patient safety. **Material and Methods:** This systematic review was conducted in accordance with PRISMA guidelines.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

یازدهمین کنفرانس علمی



We searched PubMed, Scopus, Google Scholar, and EMBASE using keywords related to artificial intelligence, machine learning, burn wounds, length of stay, and secondary complications. The models evaluated included Classification and Regression Trees (CART), Random Forest, Gradient Boosting (XGBoost, LightGBM), Logistic Regression, and Artificial Neural Networks (ANN). Performance metrics comprised accuracy, sensitivity, specificity, area under the ROC curve (AUC), root mean square error (RMSE), mean absolute error (MAE), and coefficient of determination (R^2). After deduplication and eligibility screening, nine key studies (including empirical research and systematic reviews) were selected for final analysis. Findings: Among the reviewed studies, Random Forest and XGBoost exhibited the best performance for predicting a length of stay exceeding 14 days, achieving AUC values of approximately 0.81 and 0.80, respectively. LightGBM demonstrated superior performance in forecasting overall complication risk, with an AUC of about 0.845. Feature-importance

analyses consistently identified total body surface area burned (TBSA), patient age, and white blood cell count as the most influential predictors for both prolonged hospitalization and secondary complications. Conclusion: Machine learning models—particularly Random Forest and Gradient Boosting—hold promise as decision-support tools for forecasting outcomes in burn patients. To bolster clinical trust and adoption, future prospective and comparative studies are warranted, alongside the development of interpretable methods that clearly elucidate the basis for each prediction to the treating team. Keywords: Burns; Machine Learning; Length of Hospital Stay; Prognosis; Secondary Complications; Predictive Modeling



Toward Next-Generation Burn Centers: AI- Driven Opportunities to Transform into the Smart Hospital Era

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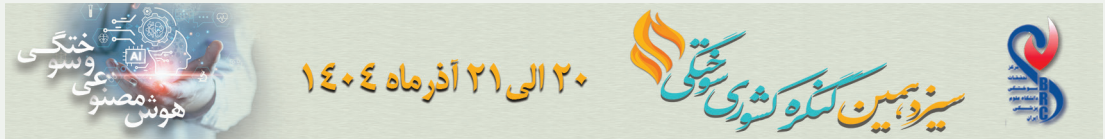
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Purpose : Burn care is a complex, resource-intensive field demanding rapid decision-making, multidisciplinary coordination, and long-term follow-up. As hospitals evolve into intelligent ecosystems, artificial intelligence (AI) presents an opportunity to modernize burn departments and redefine clinical workflows. This narrative review explores the current and emerging applications of AI across the burn centers, framed within the context of transforming burn care in the age of intelligent hospitals, with the goal of identifying technological advances, clinical benefits, and future pathways.

Methods : A comprehensive literature search was conducted using MEDLINE, Embase and PubMed databases to identify peer-reviewed studies published from 2015 to 2025. Relevant articles were reviewed in 10 different categories quantitatively and qualitatively for clinical applications, algorithms, outcomes and validation methods. AI innovations suitable for incorporating into hospital settings in remote triage, risk stratification, resource allocation, personalized care, real-time monitoring, proactive intervention, and hospital infrastructure in automating supply chain were included. Studies on machine learning, deep learning, computer vision, and decision-support systems relevant to burn medicine were critically analyzed.

Results : A total of 46 observational studies were included for review demonstrating AI showed clinical utility in early burn depth classification, mortality prediction, fluid resuscitation optimization, and infection surveillance. Computer vision enables automated wound assessment and healing prediction, while predictive models inform ICU triage and long-term outcomes. Integration with hospital systems enhances workflow, resource allocation, and smart monitoring. AI-driven rehabilitation, mental health prediction, and remote care models extend post-acute management. Despite these advances, ethical concerns: bias, transparency, and regulatory compliance remain critical barriers to large-scale implementation.

Conclusion : Artificial intelligence is poised to revolutionize burn medicine by enabling real-time, personalized, and efficient care within the framework of smart hospitals. Interdisciplinary collaboration will be essential to harness AI's full potential while safeguarding ethical integrity, data security, and accountability. The future of burn care is not only data-driven but intelligently human-centered.



Implementation of a Burn Injury Registry in Ahvaz: A Foundational Infrastructure for Health Big Data Generation and Analysis in Southwest Iran

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Purpose : Burn injuries represent a major public health challenge in southwest Iran. However, the absence of structured health data systems has hindered effective care processes, research, and policymaking. Health registries are vital infrastructures for generating standardized, large-scale data and support evidence-based care, clinical decision-making, and resource allocation. This study aimed to design and implement an electronic registry for burn patients in Ahvaz as a foundational system for generating and utilizing health big data.

Methods : This applied, descriptive–analytical study was conducted in three phases: (1) Development of a minimum data set through a paper-based checklist, creation of a software platform, and formulation of registration and case-finding protocols; (2) Pilot implementation at Taleghani Hospital, the only specialized burn center in southwest Iran; (3) Expansion through collaboration agreements with other burn centers affiliated with medical universities nationwide. Data quality was ensured through both preventive and retrospective control mechanisms.

Results : The registry system enabled accurate, real-time, and standardized data collection, supporting clinical monitoring, epidemiological analysis, and outcome tracking. It features integration with hospital information systems (HIS), longitudinal patient follow-up, and generation of managerial dashboards. The registry architecture demonstrates its capacity as a health big data source, aligned with the 5V model (Volume, Velocity, Variety, Veracity, and Value).

Conclusion : The establishment of the burn registry in Ahvaz marks a critical step toward developing health data infrastructure in Iran. It provides a foundation for enhancing care quality, supporting clinical and managerial decision-making, and serves as a scalable model for national implementation.



The Impact of Mobile Health Education on the Quality of Life of Burn Patients: A Study at Ali Ibn Abi Talib Hospital in Zahedan in 2025

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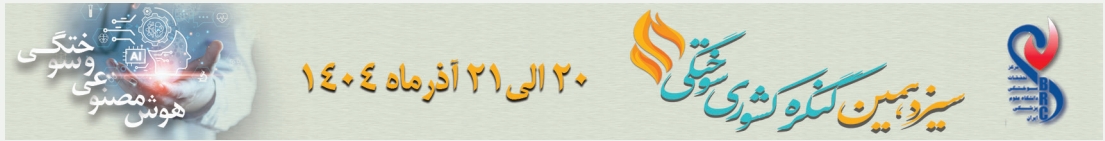
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Purpose : Burn injuries are among the leading causes of disability and mortality, significantly affecting the lives and quality of life of those affected. This study aimed to examine the impact of mobile health education on the quality of life of burn patients visiting Ali Ibn Abi Talib Hospital in Zahedan in 2025.

Methods : This research is a semi-experimental study conducted on 50 patients with second and third-degree burns who visited Ali Ibn Abi Talib Hospital in Zahedan during the years 2023-2024. Patients were randomly divided into two groups of 25 using block randomization: the intervention group and the control group. The intervention group received mobile health education in addition to routine education, focusing on three aspects of quality of life through a smartphone application designed and developed by the researcher for the Android operating system. The control group received only routine education. Data were collected using the Burn Specific Health Scale – Brief (BSHS-B) questionnaire before the intervention, and one month, three months, and six months after the intervention, and were analyzed using SPSS software version 26.

Results : The results of the study indicated that the mean quality of life score in the mobile health education group and the control group showed no statistically significant difference before the intervention ($p > 0.05$). However, after the intervention, there was a statistically significant difference in the increase of the mean quality of life score (in all domains) between the intervention group and the control group ($p < 0.05$).

Conclusion : Mobile health education enhances the quality of life of burn patients, and it is recommended for treatment teams to utilize multimedia programs to improve the quality of life for these patients.



Challenges in Implementing Artificial Intelligence in Surgical Procedures: A Qualitative Study

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Introduction: The integration of artificial intelligence (AI) systems into operating rooms represents a promising innovation with considerable potential to enhance surgical quality and patient safety. However, the effective implementation of these systems encounters multiple challenges that impede their optimal utilization. This study aimed to identify and comprehensively analyze the barriers to the adoption of AI systems in surgical practice.

Methods: This qualitative study was conducted with 15 surgical specialists from the teaching hospitals of Mashhad and Bojnourd Universities of Medical Sciences, recruited through purposive sampling. Data were collected via semi-structured interviews. All interviews were audio-recorded and transcribed verbatim immediately following each session. Data analysis was performed using thematic analysis, with coding conducted in three phases to extract the main and subthemes.

Results: The analysis revealed four primary challenges associated with the integration of AI into surgical procedures: lack of trust in AI technologies, insufficient training in artificial intelligence, ethical and data security concerns, and the need for standardization to ensure effective implementation. Subthemes included inadequate technical oversight and support, as well as the substantial financial burden associated with adopting advanced technologies.

Conclusion: This study underscores the existence of significant barriers to the acceptance and integration of AI systems in surgical care. Addressing these challenges is essential to foster trust and facilitate the widespread adoption of AI technologies within the surgical community. Structured training programs and the establishment of clear, evidence-based standards may substantially improve the trajectory of AI implementation in surgical practice.

Keywords: Artificial Intelligence, Surgical Procedures, Qualitative Research.

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Title Integrative Management of a Full-Thickness Diabetic Burn Wound Using Maggot Debridement and Mesenchymal Stem Cell-Based Amniotic Membrane Transplantation: A Clinical Case Report

Mohammad Javad Baradaran Kenari¹ *, Amirhossein Mirmohammadpour¹

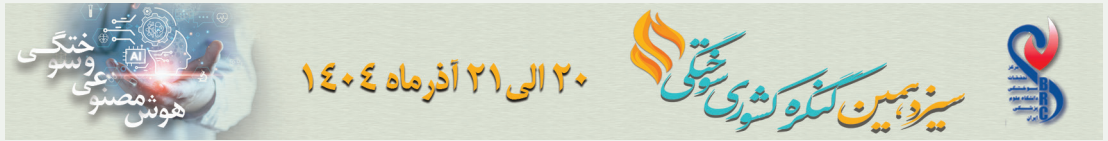
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Purpose : Diabetic neuropathy often delays recognition of burn injuries, leading to severe complications such as deep tissue necrosis and chronic wounds. This report presents a 65-year-old male with uncontrolled type 1 diabetes, chronic kidney disease, and peripheral neuropathy who developed bilateral full-thickness plantar burns due to prolonged exposure to an electric heater under a traditional “korsi.” He presented with necrosis, tendon exposure, purulent discharge, and systemic signs of infection. The aim was to evaluate a combined approach using sharp debridement, maggot debridement therapy (MDT), and mesenchymal stem cell-based amniotic membrane transplantation (MSC-AMT).

Methods : Initial management included three serial sharp debridement sessions. Due to high bleeding risk and low hemoglobin, two 48-hour MDT sessions were performed. Silver hydrofiber dressings (Exufiber Ag⁺) were used for exudate control and infection management. Once 70–80% granulation was achieved, weekly MSC-AMT using cryopreserved membranes was initiated. Dressing frequency was reduced from twice a week to once weekly. Antibiotic therapy was started early due to systemic infection.

Results : The wound showed substantial improvement, with reduced discharge, granulation tissue formation, and early epithelialization. MDT was well-tolerated, and MSC-AMT accelerated healing. However, complete offloading was not achieved. Despite favorable local response, the patient expired from a pulmonary embolism three months after initial presentation due to underlying cardiovascular disease.

Conclusion : This case highlights the effectiveness of combining MDT and MSC-based AMT in complex diabetic burn wounds. Regenerative therapy improved healing and reduced dressing frequency. While comorbidities influenced the final outcome, the wound care strategy proved clinically valuable and can inform future protocols in high-risk patients.



Does the Non-Cultured Autologous Keratinocytes Spray Improve the Speed of Epithelialization in Deep Burn Wounds Receiving Wide Meshed Skin Graft?

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Purpose : One innovative cell therapy involves the application of keratinocyte sprays, offering an alternative to traditional treatments. The use of autologous keratinocytes represents a novel medical strategy that accelerates epithelialization at the injury site.

Methods : Autologous skin grafts were harvested from the patient and after transplanted to the burn site as 1:3 meshed split-thickness skin graft. Post-transplantation, residual skin graft fragments were utilized for keratinocyte extraction. Skin fragments were treated with Dispase II solution. The epidermal layer was incubated in 0.05% trypsin and 0.02% EDTA, while the dermal layer was treated with collagenase.

Results : Of the 10 patients selected, 6 (60%) were male. The mean age of the patients was 37.6 ± 9.4 , and the mean percentage of burn was 36.7 ± 8.0 . The rate of wound epithelialization on the third day was $54.5 \pm 8.2\%$ on the case side, which was not significantly different from the control side of 49.5 ± 7.6 ($P > 0.05$). However, on the fifth day, the percentage of wound epithelialization on the intervention side (78.0 ± 7.5) was significantly higher than the control side (61.5 ± 7.4) ($P < 0.05$). On the seventh day, the rate of wound epithelialization on the intervention side (92.8 ± 5.3) was significantly higher than the control side (71.7 ± 6.2) ($P < 0.01$). In an in vitro study, an average of 1,020,000 cells were counted per cubic milliliter of keratinocyte solution prepared for spraying.

Conclusion : This study extracted approximately one million keratinocytes per square centimeter from intraoperative skin graft remnants. These cells were sprayed onto 1:3 meshed areas, which caused significant improvement in speed of epithelialization.



Single-Dose Estradiol Valerate in Severe Burns: Impact on Hospitalization and IL-6

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Purpose : Severe burns trigger intense inflammatory responses, often leading to prolonged hospitalization and complications. Estradiol valerate, a form of estrogen, has been suggested to modulate inflammation and improve outcomes in critical illnesses. This randomized clinical trial aimed to evaluate the effect of a single dose of estradiol valerate on hospitalization duration and inflammatory marker interleukin-6 (IL-6) levels in patients with severe burns.

Methods : Forty-one patients with severe burns were randomly assigned to receive either a single intramuscular dose of estradiol valerate (0.5 mg/kg, n=21) or standard treatment without estradiol (n=20). IL-6 levels were measured on days three and five post-injection. The primary outcome was length of hospital stay, and secondary outcomes included changes in IL-6 levels.

Results : Patients treated with estradiol valerate had a significantly shorter average hospitalization duration compared to the control group (7 vs. 10 days, $p \leq 0.001$). Additionally, IL-6 levels were significantly reduced on days three and five in the estradiol group, indicating a decreased inflammatory response.

Conclusion : A single dose of estradiol valerate may effectively reduce inflammation and shorten hospitalization in severe burn patients. These promising results warrant further investigation through larger, multi-center clinical trials to validate the therapeutic potential and safety of estradiol valerate in burn care.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

بیستمین کنفرانس علمی



Predicting Clinical Outcomes in Burn Patients Using Machine Learning Models: A Retrospective Analysis

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Purpose : Burn injuries remain a significant public health concern, with diverse outcomes ranging from complete recovery to death. Predicting these outcomes upon patient admission can assist clinicians in making timely and informed decisions. This study aimed to develop and evaluate machine learning models to predict clinical outcomes in burn patients using a comprehensive set of demographic, clinical, and injury-related features.

Methods : A dataset comprising 545 burn patients was retrospectively analyzed. Features included demographic information (e.g., age, sex, education), clinical parameters (e.g., respiratory rate, oxygen saturation, comorbidities), injury characteristics (e.g., burn degree and body surface area involved), and treatment-related variables. The primary outcome was the final clinical disposition, categorized into five classes: complete recovery, recovery with complications, discharge on request, referral to another hospital, and death. Random Forest, Support Vector Machine (SVM), and Logistic Regression classifiers were trained and evaluated. Model performance was assessed using accuracy, precision, recall, and F1-score.

Results : The Random Forest model achieved the highest overall accuracy (81.28%), outperforming SVM (78.90%) and Logistic Regression (77.06%). The Random Forest also demonstrated superior performance in detecting severe outcomes, particularly mortality and discharge on request. However, classification performance for rare outcome classes (e.g., referral, recovery with complications) was limited due to class imbalance.

Conclusion : Machine learning algorithms, particularly ensemble methods like Random Forest, show promise in predicting burn patient outcomes using routine clinical data. These models may support early risk stratification and optimize resource allocation in burn care centers. Further studies with larger, balanced datasets are recommended to improve generalizability and performance across all outcome categories.



Comparison of Fluid Therapy Outcomes by Adding 50% Dextrose to Lactated Ringer's Solution Versus Adding Maintenance Fluid to Calculated Volume in the Treatment of Burn Patients Under Five Years Old

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Purpose : Burns are among the leading causes of mortality and clinical interventions in children. Appropriate fluid management during the burn shock phase plays a key role in preventing metabolic complications and improving prognosis. This study aimed to compare two fluid therapy approaches—adding 50% dextrose to lactated Ringer's solution versus adding maintenance fluid to calculated volume—in children under five years old with burns $\geq 15\%$ total body surface area (BSA).

Methods : This randomized clinical trial was conducted in hospitals in Sanandaj in 2024. Sixty patients under five years of age were randomly assigned into two groups: Group A (dextrose + lactated Ringer's) and Group B (calculated fluid + maintenance solution). Variables including blood glucose levels, Inferior Vena Cava (IVC) diameter, burn severity, infection rate, and mortality were collected and analyzed using SPSS v25.

Results : Mean blood glucose levels were significantly higher in Group A (87.8 ± 8.9 mg/dL) compared to Group B (67.6 ± 8.2 mg/dL) ($P=0.02$). IVC diameter was better preserved in Group B ($P=0.03$). Additionally, infection rates and surgical intervention needs were significantly lower in Group A ($P<0.05$). The average ICU and hospital length of stay were shorter in Group A.

Conclusion : Adding 50% dextrose to lactated Ringer's solution was effective in improving glucose status and reducing metabolic complications, whereas the use of calculated fluid with maintenance solution was more effective in preserving intravascular volume. Therefore, the choice of appropriate fluid therapy should be based on the patient's clinical condition and available healthcare infrastructure.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

یازدهمین کنفرانس علمی



Evaluation of the Effect of Plasmapheresis on the Treatment of Patients with Severe Burns (>50% BSA) Admitted to the Intensive Care Unit

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Purpose : Severe burns (>50% BSA) are associated with systemic complications and high mortality. This study aimed to determine the impact of plasmapheresis as an adjunctive therapy on improving clinical outcomes in patients with extensive burns.

Methods : This randomized clinical trial was conducted at hospitals in Sanandaj in 2024. Twenty-four patients with burns exceeding 50% BSA were randomly assigned into two groups: the treatment group (plasmapheresis plus standard care) and the control group (standard care only). Data including ICU and hospital length of stay, ventilator dependence, infection rates, inflammatory changes, and mortality were collected and analyzed using SPSS v24.

Results : The mean duration of ventilator support was 2.57 ± 1.67 days in the treatment group and 2.87 ± 2.50 days in the control group ($P=0.159$). ICU length of stay was 5.11 ± 5.00 days in the treatment group and 4.88 ± 6.33 days in the control group ($P=0.183$). Total hospital stay was 14.78 ± 14.50 days in the treatment group and 16.63 ± 16.00 days in the control group ($P=0.784$). The treatment group showed significantly greater improvement in inflammatory markers and reduced infection rates ($P<0.05$). No significant difference was observed in mortality between the groups.

Conclusion : Plasmapheresis appears to be effective in reducing infections and improving inflammatory status in patients with severe burns, although it does not significantly affect ICU length of stay or mortality. Therefore, plasmapheresis can be considered as an adjunctive therapy in the management of severe burn patients.



Oropharyngeal Dysphagia and Odynophagia in Patients with Thermal Burn Injuries

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2. *Soheila Marefat-Rahimzadegan*

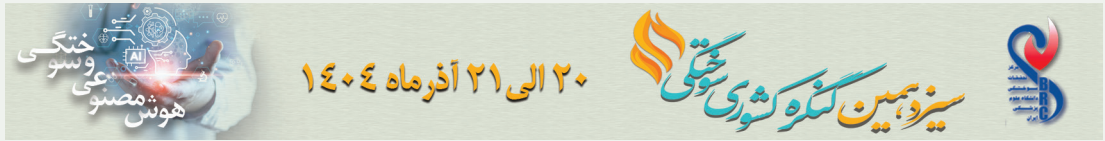
3. *Dr. Jalal Bakhtiyari*

Purpose : Dysphagia and odynophagia pose significant challenges to patients' overall well-being and recovery after thermal burn injuries. The aim of study is to document the clinical presentation of oropharyngeal dysphagia and odynophagia in dysphagic patients with thermal burns with/without inhalation injury.

Methods : Twenty-five patients with signs and symptoms of dysphagia who were admitted to the ICU and burn wards were included in this descriptive cross-sectional study based on swallowing screening. All participants underwent the swallowing assessment using the Mann Assessment of Swallowing Ability (MASA). The severity of dysphagia was determined by the Purpose-Built Rating Scale, and the Numerical Rating Scale (NRS) was used to measure odynophagia severity score by speech- language pathologists (SLPs).

Results : Evaluations confirmed that 16 (64%) patients had bolus escape in the oral preparation phase, 16 (64%) patients complained of solid food being stuck in the throat, and seven (28%) patients had attempted bovine when asking for a voluntary cough. In voice evaluation, seven (28%) patients also had mild impairment and slight huskiness, and five (20%) patients had hoarseness. The severity of dysphagia was ordered as 52% mild, 28% severe, and 20% moderate. A significant majority of patients (92%) experienced odynophagia, with a moderately high average pain level ($M= 6.2$, $SD= 2.56$).

Conclusion : Patients with thermal burn injuries struggled with a wide range of odynophagia and dysphagia. Detecting various characteristics of dysphagia caused by thermal burns helps researchers take proper steps toward developing swallowing assessment tools tailored to its unique impairment characteristics.



the effect of family-centered education on caregiver burden in caregivers of burn patients

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Purpose : Burn injuries change the normal course of life. Due to the stable relationships between the individual and the family, they face challenges and bear the burden of care. By educating caregivers about care information, their stress is reduced. The main feature of the family-centered approach is the participation of the family in care and communication between the family and the therapist, as well as sharing information related to care. This study aimed to determine the effect of family-centered education on the care burden of burn caregivers.

Methods : study was a two-group quasi-experimental study, and 40 people in each group were conducted based on the inclusion and exclusion criteria. The instruments included a demographic profile form and the Zarit Care Burden Questionnaire. Education for caregivers was provided in 4 sessions of 45 to 60 minutes using a lecture and question and answer method with educational content. The educational content was provided to the caregivers of the control group after the intervention.

Results : results of the independent t-test showed that before the intervention in the two groups, there was no statistically significant difference in the caregiving burden and its dimensions, but after the intervention, the difference in the two groups became significant, so that the average score obtained in the intervention group was significantly lower than the control group. The results of the paired t-test showed that in the intervention group, the caregiving burden and its dimensions had a statistically significant decrease compared to before the intervention, but this difference was not significant in the control group.

Conclusion : changes in the intervention group were negative, which means a decrease in the caregiving burden and its dimensions, and in the control group, the changes were very small and positive. The results of the independent t-test showed that this difference in the two groups was also statistically significant



Base Deficit, Serum Albumin, and CRP/Albumin Ratio as Prognostic Predictors in Severe Burn Patients

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Purpose : Early prediction of outcomes in severe burn patients is critical for guiding clinical management and improving survival rates. Identifying reliable prognostic biomarkers can facilitate timely interventions in burn intensive care units (ICUs). This study aimed to evaluate the prognostic value of base deficit, serum albumin, and C-reactive protein (CRP)/albumin ratio measured during the first week of ICU admission in patients with severe burns.

Methods : A retrospective analysis was conducted on 195 patients with 20-80% total body surface area (TBSA) burns admitted to a burn ICU. Base deficit, serum albumin, and CRP levels were recorded on days 1, 3, 5, and 7 of admission. Statistical comparisons were made between survivors and non-survivors, and multivariate regression analysis was used to identify independent predictors of mortality.

Results : Significant differences were found between survivor and non-survivor groups in serum albumin (3.05 ± 0.56 g/dL vs. 1.89 ± 0.69 g/dL), base deficit (3.36 ± 2.15 vs. 10.62 ± 1.71), and CRP levels (20.95 ± 29.33 g/dL vs. 54.62 ± 46.29 g/dL) ($p < 0.001$ for all). Multivariate regression demonstrated that decreased albumin and increased CRP/albumin ratio were significantly associated with higher mortality risk ($p < 0.05$).

Conclusion : Base deficit, serum albumin, and CRP/albumin ratio are valuable prognostic markers in severe burn patients. Their early measurement can aid in risk stratification and guide clinical decision-making to improve patient outcomes.



Development of a Decision-Support Algorithm for Prehospital Assessment and Triage of Burn Patients: An Expert Consensus Approach

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Purpose : Burn injuries are among the most critical medical emergencies, and inadequate early assessment can result in rapid clinical deterioration, secondary complications, and increased mortality. Despite their importance, there is a significant gap in the availability of practical, standardized guidelines for evaluating and triaging burn patients in prehospital settings. This study aimed to design a clinically applicable algorithm to assist emergency medical technicians (EMTs) in making timely and accurate decisions during the initial management of burn victims.

Methods : This two-phase developmental study began with a systematic review of international guidelines and peer-reviewed literature to extract key assessment parameters, including severity estimation, airway compromise, and referral indicators. In the second phase, a three-round Delphi process was conducted involving 12 experts (emergency physicians, burn specialists, and prehospital care providers) to refine and validate the algorithm. Content validity was assessed using the Content Validity Index (CVI), and usability testing was performed with 30 EMTs in simulated prehospital scenarios.

Results : The finalized algorithm comprises five operational steps: (1) rapid estimation of total body surface area (TBSA) burned, (2) assessment of airway involvement and potential need for early intubation, (3) identification of high-risk burn zones (e.g., face, hands, perineum), (4) initiation of fluid resuscitation when indicated, and (5) transport decision-making based on severity and facility capabilities. The CVI score was calculated at 0.91, and 86% of participants rated the algorithm as practical and easy to implement in field conditions.

Conclusion : The implementation of this algorithm has the potential to improve the accuracy and speed of prehospital burn assessment, reduce clinical errors, and optimize patient referral pathways. Integration into EMT training programs and emergency response protocols is strongly recommended.



Evaluation of the effect of Muscle Relaxation and Mental Visualization on Morphine intake in patients with second degree burn wounds

Fatemeh Delfani¹ *

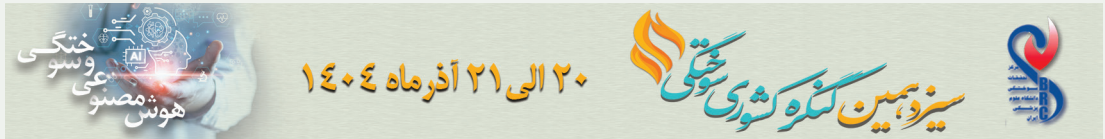
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Purpose : Burn pain management is of paramount importance at all stages of burn therapy due to posing physical and psychosocial threats to burn patients in case of uncontrolled pain. The narcotic analgesics (e.g., morphine) are one of the pharmacological treatments for burn pain control, which are usually inadequate to relieve the burn pain and are accompanied by complications. Non-pharmacological interventions in combination with pharmacological measures are thus required to attenuate pain in burn patients and reduce the amount of morphine intake. This study aimed to evaluate the effect of muscle relaxation and mental visualization on morphine intake in patients with second degree burn wounds.

Methods : This clinical trial was conducted on 135 burn patients who were assigned to either the experimental groups or the control group. Morphine levels were measured based on the control group patients' weight at the time of acute burn injury. The control group received no intervention. After discharge of the control group patients, the patients in the men ward 1 and men ward 2 were taught muscle relaxation and mental visualization, respectively, and the amount of morphine used by patients was measured. The mean consumption of morphine was compared in three groups. The data were analyzed with SPSS 16 software using ANOVA and Chi-square tests.

Results : According to the results of ANOVA, there was no significant difference in the mean morphine consumption on the first day of burn injury between the experimental and the control groups ($p=0.98$). Moreover, the test results showed a significant difference in the mean morphine consumption on the second day of burn injury between the control group and the relaxation group ($P=0.02$) and between the control group and the mental visualization group ($P=0.001$).

Conclusion : There was a significant difference in the mean morphine consumption between the control group and the relaxation group. Mental visualization was more effective than muscle relaxation.



incidence of delirium in burn-affected men with a history of opioid abuse and haven't history of addiction in Ali Ibn Abi Talib (AS) Hospital in Zahedan in 1404

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Purpose : Delirium is a common and serious psychiatric disorder in hospitalized patients, especially in special wards such as burn units, which is associated with sudden changes in the level of consciousness, attention, and cognitive function. The occurrence of delirium can severely affect the treatment process and prognosis of patients. There is evidence that the use of opioids such as opium and methadone may increase the risk of delirium in acute medical conditions. This study aimed to investigate the incidence of delirium in male burn survivors with and without a history of opioid addiction, conducted at AH in Zahedan in 1403..

Methods : This cross-sectional descriptive-comparative study was conducted in 1403 AH in the burn ward of Ali bin Abi Taleb (AS) Hospital in Zahedan. The sample included 49 men aged 20 to 50 years who were hospitalized due to burns. The percentage of patients' burns was between 15 and 50% and was of second and third degree. Among these patients, 11 had a history of opioid abuse and 38 had no history of addiction. The diagnosis of delirium was made by a psychiatrist and a clinical psychologist based on clinical criteria. The data were analyzed using descriptive indicators (frequency and percentage)..

Results : In the group of addicted men, 4 out of 11 (36.3%) developed delirium, while in the group of non-addicted men, only 1 out of 38 (2.6%) showed symptoms of delirium. This difference indicates a higher prevalence of delirium among patients with a history of addiction

Conclusion : The results of this study suggest that the use of opioids such as opium and methadone may be associated with increased rates of delirium in burn patients. These findings suggest more careful psychiatric screening and monitoring of this group during hospitalization and could provide guidance for designing psychiatric interventions and targeted support to reduce psychological harms resulting from burns and trauma

The Effect of Family-Centered Care on Anxiety Levels of Family Members of Hospitalized Burned Children in Velayat Hospital, Rasht



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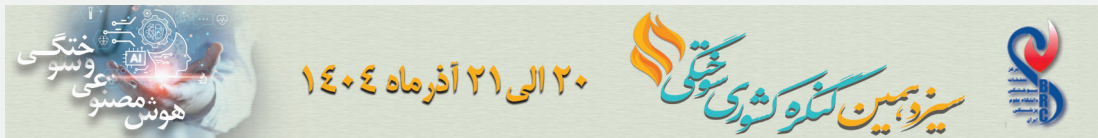
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Purpose : Burn injuries impose significant financial and psychological burdens on families and healthcare systems. Pediatric burns are a leading cause of traumatic death in children under five, with long-term physical and psychosocial consequences. Hospitalization exacerbates anxiety in both children and their families, potentially hindering caregiving and recovery. Family-centered care (FCC) interventions may mitigate this anxiety by empowering families through education and emotional support. This study evaluated FCC's impact on anxiety levels among family members of burned children in Rasht, Iran

Methods : A randomized controlled trial was conducted with 160 family members of burned children admitted to Velayat Hospital (2024). Participants were block-randomized into intervention (FCC) or control (routine care) groups. The FCC group received structured educational support, emotional counseling, and involvement in care planning, while the control group received standard care. Anxiety was measured using the STAI-State questionnaire at admission and post-transfer to the surgical ward.

Results : Post-intervention, the FCC group showed a significant reduction in anxiety scores (mean reduction: 18.7 ± 4.2 points) compared to the control group (mean reduction: 5.3 ± 3.8 points; $p < 0.001$). Baseline anxiety scores were comparable between groups (FCC: 56.2 ± 6.1 ; control: 55.8 ± 5.9 ; $p = 0.72$). Demographic factors (e.g., parental age, burn severity) had no confounding effect ($p > 0.05$).

Conclusion : FCC effectively reduces anxiety in family members of burned children, underscoring its value in pediatric burn care. Integration of FCC into clinical protocols is recommended to enhance family coping and improve patient outcomes.



Erosion of Prehospital Burn Care Standards: A Qualitative Study of Emergency Medical Service Providers' Experiences

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Introduction: Prehospital care for burn victims constitutes the first critical link in the continuum of burn management, with a pivotal role in reducing mortality, optimizing clinical outcomes, and preventing long-term disability. Despite established guidelines, field evidence suggests a gradual erosion of these standards, resulting in a gap between recommended practices and real-world performance. This study aimed to explore the dimensions and underlying causes of this erosion from the perspective of prehospital emergency care providers.

Methods: A qualitative study was conducted using a conventional content analysis approach. Twenty-four prehospital emergency medical service personnel from Iran were recruited through purposive sampling, with data collection continuing until saturation was achieved. Data were obtained through semi-structured interviews and field observations and analyzed using conventional content analysis.

Results: A total of 396 initial codes were generated, yielding five overarching categories: deficiencies in triage, inadequate execution of essential care, shortcomings in performance evaluation, shortage of specialized resources and equipment, and unclear role allocation. Key dimensions included insufficient use of standardized triage tools, suboptimal airway management, inadequate care for burn patients with concomitant trauma, ineffective circulatory monitoring, absence of burn shields, lack of portable mechanical ventilators, prioritization of rapid transport over clinical interventions, limited clinical skills in severe burn management, disregard for care quality, and failure to address concerns about technician performance.

Conclusion: The erosion of prehospital burn care standards is a multifaceted phenomenon arising from deficiencies in specialized training, the absence of explicit protocols, inadequate supportive infrastructure, and insufficient performance evaluation mechanisms. Targeted educational interventions, process revision, and the implementation of robust feedback systems are essential to restore the quality of prehospital burn care.

Keywords: Burns, Emergency Medical Services, Health Services Needs and Demand / standards.

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Legal and Ethical Challenges in Burn Injury Management: A Systematic Review

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Purpose : Burn injuries often result in long-term physical and psychological damage, accompanied by complex legal and ethical dilemmas. This systematic review aims to investigate current legal frameworks and ethical considerations in burn injury care, with a focus on liability, informed consent, and compensation systems in healthcare and occupational contexts.

Methods : This study follows PRISMA 2020 guidelines. A systematic search was conducted in PubMed, Scopus, and Google Scholar for English-language articles published between 2000 and 2024. Keywords included “burn injury,” “medical ethics,” “legal liability,” “informed consent,” “occupational injury,” and “compensation.” After screening 1,346 records, 53 articles met the eligibility criteria.

Results : Of the 53 included studies, 62.2% (n=33) focused on legal claims following thermal injuries in healthcare settings and the workplace. Approximately 41.5% (n=22) addressed gaps in informed consent, especially in emergency surgical burn procedures. Only 28.3% (n=15) discussed structured compensation systems, revealing major discrepancies between high-income and low-income countries. Several studies emphasized the ethical conflict between emergent treatment and legal documentation, especially in pediatric and incapacitated adult patients. Burn victims in developing countries had significantly reduced access to legal representation (reported in 63.6% of relevant studies).

Conclusion : The legal and ethical dimensions of burn care are often overlooked in clinical guidelines, despite their importance in ensuring justice and equity. A unified legal approach that integrates ethical principles such as autonomy and justice is essential, particularly in resource-limited settings. Policymakers should develop context-sensitive legal guidelines that support both patients’ rights and clinical efficiency.



Title: The Effectiveness of Novel Wound Cooling Techniques in Preventing Secondary Burn Complications: A Systematic Review and Meta-Analysis

Abstract ID: 153

subject: جراحی های حاد و ترمیمی

Mahya Azimi¹ (Corresponding Author, Presenter) Seyed Mohammad Reza Niktebar²

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Purpose : Burn injuries are among the most significant skin and tissue traumas, potentially leading to complications such as infection, necrosis, hypertrophic scarring, and delayed healing. Rapid cooling of the burned area is considered a key and effective early intervention. Recently, novel cooling techniques—including hydrogel dressings, silicone cooling dressings, evaporative sprays, and thermotherapy devices—have been developed to improve treatment outcomes. This study aimed to evaluate the effectiveness of these techniques in preventing secondary burn complications.

Methods : This systematic review and meta-analysis was conducted according to PRISMA guidelines. A comprehensive search was performed in PubMed, Scopus, and Web of Science databases for studies published between 2010 and 2024, using relevant keywords. Out of 542 retrieved articles, after excluding duplicates, animal studies, and irrelevant papers, 23 studies (17 randomized clinical trials and 6 non-randomized interventional studies) were included. Data were analyzed using RevMan 5.4 software with a random-effects model. The outcome measures included incidence of infection, tissue necrosis, wound healing time, and hypertrophic scar formation.

Results : Results demonstrated that novel cooling techniques significantly reduced infection incidence compared to traditional running water cooling (RR=0.68, p<0.01) and decreased tissue necrosis (RR=0.74, p=0.005). Wound healing time was shortened by an average of 3.5 days (Mean Difference=-3.5, p<0.001). The incidence of hypertrophic scars was lower, though not statistically significant (RR=0.85, p=0.08). In addition, patients reported a significant reduction in pain intensity. These findings confirm the clinical effectiveness of advanced wound cooling strategies in improving burn care outcomes.

Conclusion : Novel wound cooling techniques can reduce complications such as infection and necrosis and accelerate the wound healing process. Their implementation in clinical settings is recommended; however, further high-quality studies are required for stronger validation.



Title: Intelligent Decision-Making in Acute Repair Surgery: The Role of Artificial Intelligence in Robotic Surgery

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Purpose : Introduction Acute repair surgeries require rapid and precise decision-making. However, even the most advanced robotic systems face challenges in real-time adaptation, accurate intraoperative decision-making, and clinical judgment. The current knowledge gap revolves around the integration of artificial intelligence (AI) for decision support in these procedures, given the frequent occurrence of unpredictable anatomical and patient condition changes. Although recent advancements demonstrate that AI can enhance robotic surgery through image analysis, surgical phase recognition, and complication prediction, comprehensive evidence in acute repair surgery remains limited (1,2,4). Objectives This study was designed as a systematic review to evaluate existing evidence on the role of AI in supporting decision-making during robotic acute repair surgery. The primary focus was on three key areas: - Improving clinical outcomes - Reducing surgical errors - Optimizing procedural efficiency

Methods : Methods A structured literature search (2018–2024) identified 42 initial studies. Following title, abstract, and full-text screening, 7 high-quality articles directly relevant to AI applications in acute repair robotic surgery were selected (1-5).

Results : Results - 30% increase in anatomical recognition accuracy with AI-based image processing - 18% reduction in intraoperative errors - 20% improvement in postoperative recovery metrics - 40% decrease in conversion rates to open surgery for complex cases (2,4)

Conclusion : Conclusion The integration of AI into robotic surgical systems has transformed intraoperative decision-making, reduced errors, and improved patient outcomes. While these findings support broader clinical adoption of this technology, further validation is essential to ensure its safety and efficacy in acute surgical settings (1,2,4).



Artificial intelligence in acute and reconstructive surgeries for burn patients

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Purpose : Deep burn wounds are one of the types of wounds that have a high probability of becoming chronic wounds. Burn scars are formed after deep burn wounds that cannot heal spontaneously within three weeks. In modern surgery, in order to repair the burn site and prevent the complication of tissue deformation, 5 to 7 days after the burn, all the burned tissue formed from the site is removed and primary repair is performed. The aim of this study is to investigate the effect of artificial intelligence in acute and reconstructive surgeries of burn patients.

Methods : The present study is a review study. Sources were extracted from ISI, PubMed, Scopus, and Google Scholar databases. The search in these databases was performed using the keywords: artificial intelligence, acute surgeries, and burn patients. Among the studies published between 2010 and 2024, 30 articles were extracted, and after review, 15 articles were finally reviewed.

Results : Artificial intelligence (AI) is changing the surgical landscape, especially in burn patients. This technology provides surgeons with advanced tools that enable more accurate planning, predict outcomes, and improve patient satisfaction. The three main benefits of AI include: reducing anxiety and stress, improving post-surgical satisfaction, and accelerating the healing process. AI can model the healing process after burns and help surgeons understand the impact of different surgical techniques. This information can lead to improved surgical procedures and increased patient satisfaction.

Conclusion : The use of AI in acute burn surgery is associated with improved patient outcomes, reduced costs, and increased overall quality of care. Robots equipped with AI can assist surgeons with minimally invasive procedures and reduce wound healing time.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

نیزه بین کشور شوی سنجی



Skin graft follow-up results in diabetic and non-diabetic patients with second-degree burns

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Purpose : Diabetes, as one of the most common metabolic disorders causes delays in the healing process of burn wounds. Skin grafting is one of several therapy techniques that have drawn the interest of several researchers and medical professionals in recent decades.

Methods : This was a cohort study conducted at Shahid Motahari Hospital on 56 patients with second-degree burns, including 28 diabetic patients and 28 non-diabetic patients. Following surgery, the patient was monitored for three sessions at five-day, one-, and three-month intervals, and the surgical healing process was assessed. SPSS software was used for analysis after the patient's data was gathered.

Results : According to the study's findings, both diabetic and non-diabetic patients had positive surgical outcomes.

Conclusion : Although diabetic patients have a slower rate of wound healing, skin grafting may be a viable treatment option for burns and wounds in these patients.



Advances in Acute and Reconstructive Burn Surgery: Current Practices, Emerging Techniques, and Future Directions

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Purpose : Burn injuries often need surgical treatment both immediately and during later reconstruction to restore function and appearance. Early surgery, like excision and grafting, helps close wounds, reduce infection, and lower complications. Later reconstructive procedures address functional problems, scars, and cosmetic issues. This review summarizes current surgical methods, innovations, and challenges in acute and reconstructive burn care.

Methods : A structured review of the literature was performed utilizing PubMed, Scopus, and Web of Science databases, focusing on articles published from 2008 to 2024. The selection included randomized controlled trials, cohort studies, systematic reviews, meta-analyses, and expert guidelines pertaining to surgical interventions in burn management. Keywords applied in the search strategy included “acute burn surgery,” “early excision and grafting,” “burn reconstruction,” “scar contracture release,” “skin substitutes,” and “reconstructive techniques in burns.” Data from the selected studies were analyzed and synthesized descriptively to outline surgical procedures, optimal timing, techniques, and patient outcomes.

Results : Early excision and grafting within 24 to 72 hours remains the standard for severe burns, reducing infections, hospital stays, and mortality. Split-thickness skin grafts are commonly used, while dermal substitutes and bioengineered scaffolds offer alternatives for complex wounds. Reconstructive surgeries address functional and aesthetic issues through contracture release, flaps, lasers, and cosmetic procedures. Emerging options like tissue engineering, 3D bioprinting, and regenerative therapies show promise but need further clinical validation.

Conclusion : Acute and reconstructive burn surgery represents a dynamic and advancing area of burn care that demands a multidisciplinary and patient-specific approach. Early surgical intervention paired with carefully planned reconstructive strategies is key to achieving optimal functional and cosmetic outcomes. Continued innovation and research into novel surgical techniques, skin replacements, and regenerative solutions are essential to further enhance the quality of burn care and patient recovery.



Comparison of the clinical course of diabetic and non-diabetic patients with acute burns admitted to Shahid Motahari Burn Hospital: A retrospective study

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Purpose : Acute burns are one of the most common soft tissue injuries in the body, which can lead to infections and sepsis, and diabetes can be one of the high-risk underlying diseases.

Methods : This cross-sectional study was conducted on 4506 acute burn patients hospitalized at Motahari Hospital between 2019 and 2020 in two groups: diabetic (439 patients) and non-diabetic (4043 patients).

Results : Although the number of surgeries performed on patients in the non-diabetic group during the hospitalization period was higher, the difference was not statistically significant and the average length of hospitalization of patients in the two groups did not differ significantly. The mortality rate of patients was significantly higher in the diabetic group (25.4% vs. 6.03%).

Although the number of Operation on patients and the average length of hospitalization were not statistically significantly different, the mortality rate of patients was significantly higher in the diabetic group (25.4% versus 6.03%).

Conclusion : No significant difference was observed between the duration of hospitalization, the number of Operation during treatment, and ultimately the mortality rate of diabetic and non-diabetic patients studied.



Evaluation of xenograft decellularization methods for use in skin tissue engineering for the purpose of burn treatment

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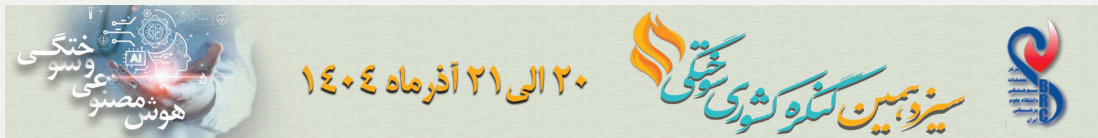
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Purpose : Burn-related trauma and scarring are among the most painful conditions in the world. When damage extends deep into the dermis layer, using dermal tissue substitutes can play a significant role in improving healing quality and speed, in addition to reducing the number of surgeries required. The use of ECM of animal origin, due to its mechanical strength, biocompatibility, and biomimetic properties, can play a major role in tissue regeneration. One of the most important challenges in using xenografts is the quality of decellularization, which aims to reduce inflammation in biological interactions with this type of scaffold.

Methods : In this study, three decellularization methods were evaluated. Bovine skin was obtained under sterile conditions from a slaughterhouse. After mechanical separation of the dermis, it was placed in 0.25% trypsin. Following immersion in 70% ethanol, the tissue was sterilized using hydrogen peroxide. For purification, a Triton washing solution containing Tris and EDTA was used. In the first non-enzymatic method, the enzyme was omitted. In the second non-enzymatic method, a 1% SDS solution was used.

Results : Three freeze-dried tissues, compared to natural control tissue, were evaluated using DAPI and H&E staining. Based on the images from these two tests, the Triton-based non-enzymatic method was not effective alone, as cellular fragments were observed. In contrast, the use of an enzymatic solution along with Triton washing, as well as the non-enzymatic SDS method, demonstrated successful performance, with over 95% of the tissue being cell-free.

Conclusion : Masson's trichrome staining showed that the optimized decellularization method adequately preserved the collagen structure in the ECM. Therefore, the ECM was effectively decellularized, without severe damage caused by washing solutions, and can be utilized for skin tissue engineering scaffolds.



Extraction and characterization of hyaluronic acid from human umbilical cord and fabrication of skin scaffold from hyaluronic acid/gelatin/alginate by a biological 3D printer

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Purpose : Hyaluronic acid (HA), a glycosaminoglycan found in the extracellular matrix, plays a vital role in tissue protection, elasticity, cell migration, angiogenesis, and wound healing. Despite advances in tissue engineering, the development of effective treatments for second- and third-degree burns remains a significant clinical challenge. This study aims to develop bioengineered skin scaffolds with optimal viscoelastic, mechanical, and biological properties using HA as a core component by 3D printer.

Methods : In this study, a novel method was employed to extract and purify HA from human umbilical cord tissue. The process included defatting and decellularization, enzymatic digestion using Wharton's jelly, precipitation with organic solvents, and separation via chromatography. Elemental analysis using Energy Dispersive X-ray Spectroscopy (EDS) confirmed the presence of elements indicative of hyaluronic acid formation. A 3D-printed scaffold was then fabricated using a blend of biodegradable polymers: hyaluronic acid, gelatin, and cross-linked alginate.

Results : This composition provided enhanced mechanical stability. Scanning Electron Microscopy (SEM) revealed a porous microstructure favorable for cellular infiltration. Fourier-Transform Infrared Spectroscopy (FTIR) verified the successful integration and compatibility of the hydrogel components. Hydrophilicity was assessed using water contact angle measurements, which demonstrated that the scaffold surfaces were hydrophilic, with HA significantly enhancing wettability. Additionally, water absorption tests indicated the scaffold's strong capacity for retaining moisture, highlighting its suitability for extracellular matrix formation and application in skin tissue engineering.

Conclusion : In conclusion, this study successfully produced a highly purified hyaluronic acid-based scaffold with promising properties for medical use, particularly in the field of skin regeneration and tissue engineering.



Multipurpose hydrogel containing exosome and gentamicin to accelerate skin tissue regeneration

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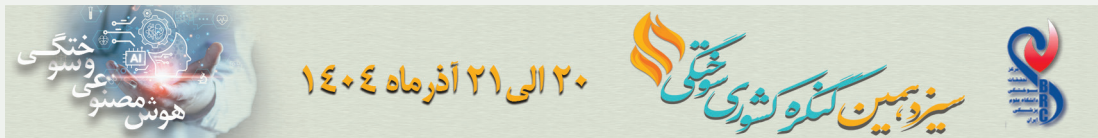
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Purpose : Full-thickness skin wounds are one of the major challenges in regenerative medicine. Exosomes, as extracellular vesicles (EVs), have anti-inflammatory, antioxidant, and regenerative properties. Hydrogels as carriers can provide gradual release of exosomes and enhance the efficacy of treatment.

Methods : In this study, a hydrogel containing gelatin, carboxymethylcellulose, and gentamicin was prepared and loaded with orange-derived exosomes (ODEVs). The physicochemical properties of the exosomes were investigated by DLS, and field emission electron microscopy (FE-SEM). The hydrogels were analyzed by FTIR and SEM methods. Antibacterial activity against susceptible and resistant strains of *E. coli*, *P. aeruginosa*, and *S. aureus* was investigated. For in vivo testing, a full-thickness skin wound model was created in rats. The wound healing process was evaluated over 14 days by imaging, and levels of VEGF and IL-1 β .

Results : Exosomes with a size of about 70–100 nm were characterized. Hydrogel had a porous and uniform structure and was biocompatible. The hydrogel containing gentamicin showed high antibacterial activity against resistant and sensitive bacteria. In in vivo tests, the group receiving the hydrogel containing exosome showed the highest wound healing rate with 99% wound closure on the 14th day. Also, a significant increase in VEGF levels and a decrease in IL-1 β levels were observed in this group compared to the other groups.

Conclusion : The hydrogel loaded with orange exosomes not only accelerates wound healing but also improves biological processes such as epithelialization, collagen formation, reduced inflammation, and increased angiogenesis.



Biological 3D Scaffold Enriched with Vitamin A: A Promising Platform for Skin Tissue Engineering

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Purpose : Skin tissue regeneration has seen significant advancements in recent years through innovative therapeutic approaches. Among these, tissue engineering using scaffolds has emerged as a rapid and versatile strategy. The extracellular matrix (ECM), with its natural three-dimensional (3D) architecture, plays a vital role in mimicking tissue microenvironments and promoting tissue repair. Vitamin A, in its active forms such as retinol, retinal, and retinoic acid, is essential for wound healing and tissue remodeling.

Methods : In this study, decellularized sheep kidney capsule tissue was used as a 3D ECM-based scaffold for skin tissue engineering. Decellularization was performed using sodium dodecyl sulfate (SDS), and the scaffold was enriched with various concentrations of vitamin A. The modified scaffolds were evaluated for biocompatibility, mechanical properties, hydrophilicity, ATR-FTIR spectra, antibacterial activity, and cell adhesion. Furthermore, the most promising scaffold (with 15,000 U/ml vitamin A) was tested in a full thickness wound model in rats.

Results : The vitamin A-enriched decellularized scaffold demonstrated enhanced hydrophilicity, good cell adhesion, and favorable antibacterial properties. Among the tested doses, 15,000 U/ml vitamin A showed optimal performance. In vivo evaluation revealed accelerated wound contraction, increased expression of vascular endothelial growth factor (VEGF), and reduced levels of interleukin-1 β (IL-1 β), indicating reduced inflammation and improved healing.

Conclusion : The combination of decellularized kidney capsule ECM with therapeutic doses of vitamin A offers a promising scaffold for skin wound healing applications. These findings support further pre-clinical investigations into ECM-based scaffolds functionalized with bioactive compounds for regenerative medicine.



Incorporation of Polymeric Composite with drug-loaded microparticle as a progressive step to inhibit bacterial contamination in burn injury

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Purpose : For centuries, the primary challenge of burn injuries has been bacterial infection, prompting researchers to develop solutions to address this issue. Among these remedies, several drugs are utilized in free particle form, necessitating the continuous application of the targeted drug. Thus, drug-loaded microparticles incorporated within a polymeric matrix are appealing, as they contribute to the sustained release of the target drug and eliminate the need for continuous application.

Methods : In this study, we used mafenide as the drug of interest and fabricated polymeric microparticles using a double emulsion approach, followed by freeze-drying. Finally, a hydrophilic polymeric matrix was applied to incorporate the drug-loaded microparticles, providing a substrate for sustained release. Subsequently, associated investigation tests, including SEM, antibacterial, and release studies, were conducted.

Results : Results revealed that the morphological analysis of microparticles was spherical. Furthermore, the antibacterial effect of this construct against the bacterial strain with sustained release was demonstrated.

Conclusion : It is concluded that this construct has potential applications for in vivo and clinical investigations as an antibacterial wound dressing.

Decellularized Human Amniotic Membrane: From Animal Models to Clinical Trials

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Purpose : Decellularized products' efficacy for healing acute and chronic wounds mostly relies on physical and chemical properties, processing methods, and host response. Human Amniotic Membrane (HAM) is considered an effective and highly used wound dressing in the clinic.

Methods : According to the proposed decellularization protocols for developing HAM, we have compared different protocols to introduce the most efficient methods, which can be used as a functional dermal matrix. In this study, different methods of HAM decellularization were used to achieve an optimal process. After achieving the appropriate decellularized method in vitro, the amniotic membrane was examined in terms of animal in vivo study and human clinical trial.

Results : The results of the in vitro and in vivo assays indicate that the HAMs, which were prepared with peracetic acid (2M) had a significantly different effect in terms of GAGs quantification, DNA isolation and quantification, histological assessment, collagen analysis, Cell-Tissue Interaction Study and cytotoxicity ($P < 0/05$). Tissue samples treated with peracetic acid (2M) were more acceptable than that of samples prepared with other protocols in terms of preserving natural components, structure, and removal of cell fragments.

Conclusion : The peracetic acid-processed HAM was further functionally evaluated through in vivo assessments that can further lead to tissue reconstruction within the human host. It is expected that with the development of similar procedures, the use of HAM-based scaffolds will play a critical role in the future of tissue engineering and reconstructive surgery.



AI-Optimized Hydrogels for Advanced Burn Wound Care

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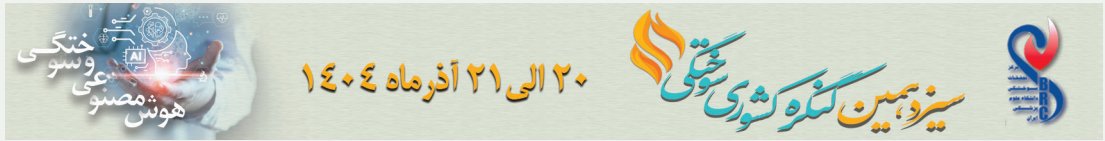
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Purpose : Burn wounds require specialized dressings that maintain moisture, prevent infection, and promote healing. Hydrogels, with their high water content (70-90%) and drug delivery capabilities, are ideal candidates due to their similarity to the extracellular matrix. However, traditional hydrogel development relies on inefficient trial-and-error methods. Artificial intelligence (AI) offers a transformative solution by accelerating biomaterial optimization. This study offers an AI-driven framework to engineer hydrogels for burn care, focusing on antimicrobial release, moisture balance, and mechanical durability.

Methods : A dataset of hydrogel compositions was compiled from literature and experimental data. Two machine learning models were implemented: an artificial neural network (ANN) for performance prediction and a random forest (RF) model for feature analysis. The dataset was split into training (80%) and validation (20%) sets, with 10-fold cross-validation. Bayesian optimization fine-tuned hyperparameters to enhance accuracy and prevent overfitting.

Results : The AI models identified critical composition-performance relationships. Crosslinking density controlled antimicrobial release, while alginate content optimized moisture retention. The AI-designed hydrogels exhibited an 89% improvement in moisture retention, effective antimicrobial activity, and a 40% increase in cell migration. Mechanical properties closely matched natural skin, confirming the model's accuracy. These findings highlight AI's potential to streamline hydrogel development while improving burn wound treatment outcomes.

Conclusion : AI-driven optimization significantly enhances hydrogel development for burn care, reducing time and improving performance. This study establishes a framework for future biomaterial design, with potential applications in personalized wound care. Further research should focus on clinical translation and integration with smart monitoring systems to advance wound dressing technology.



Modern Wound Dressings and Tissue Engineering in Burn Management: A Review of Materials and Clinical Efficacy

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Purpose : Burn injuries remain a significant clinical challenge worldwide due to complications such as infections, prolonged healing times, and scarring. Recent advances in wound dressings and tissue engineering have provided promising solutions to improve burn management outcomes. Modern dressings now incorporate bioactive materials, smart release of therapeutic agents, and nanotechnology-based enhancements. Concurrently, tissue engineering approaches aim to recreate the dermal microenvironment and accelerate regeneration. Despite these advances, clinical translation is still evolving, and clear comparisons of material properties and efficacy are needed. This review investigates the evolution of modern wound dressings and tissue-engineered constructs in burn management. It examines the spectrum of materials (from synthetic polymers to natural biomaterials), their mechanisms of action, and clinical efficacy data related to healing time, infection control, and scar prevention.

Methods : A systematic literature search was conducted from 2010 onward using databases such as PubMed, IEEE Xplore, ScienceDirect, and MDPI. Studies were screened according to predefined inclusion criteria, focusing on original research and clinical trials involving advanced wound dressings or tissue-engineered therapies for burn treatment. Data were extracted with attention to material properties, design rationale, quantitative clinical outcomes, and challenges influencing translation.

Results : The review reveals that novel materials, including hydrogels, electrospun nanofibers, and composite dressings, demonstrate superior biocompatibility, moisture retention, and antimicrobial properties. In parallel, tissue engineering platforms—comprising scaffolds seeded with cells or loaded with growth factors—have shown encouraging early clinical outcomes. Comparative analyses indicate that reduced healing times and lower infection rates are achieved when using these advanced wound care modalities.

Conclusion : Modern wound dressings and engineered constructs are revolutionizing burn care. However, standardization, large-scale clinical trials, and integration into routine practice remain critical issues. Future research should focus on translational pathways, cost-effectiveness analyses, and regulatory aspects to fully leverage these innovations in clinical settings.



Nanomedicine in Wound Healing: Emerging Strategies and Future Prospects

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Purpose : The development of novel and effective wound healing products is a critical aspect of modern wound care, particularly in the management of chronic wounds. Proper wound treatment remains a significant global health challenge, and recent advances have led to the discovery of high-quality agents that enhance the wound repair process. Among these, nanomedicine has emerged as a promising field, offering considerable progress in the treatment of various diseases, especially in wound healing and tissue regeneration.

Methods : This review aims to explore the extensive role of nanomedicine in accelerating wound recovery, focusing on how nanoparticles (NPs) interact with damaged tissues to initiate and support the healing process. Nanotechnology-based strategies—including the use of nanomaterials, nanofibers, nanoscale scaffolds, and biomaterials—offer innovative approaches to treating both acute and chronic wounds. Over the past decade, the application of nanomaterials in pharmaceutical and biomedical contexts has gained substantial attention. Many of these materials are now incorporated into products such as drug delivery systems, skin substitutes, and advanced wound dressings.

Results : This review aims to explore the extensive role of nanomedicine in accelerating wound recovery, focusing on how nanoparticles (NPs) interact with damaged tissues to initiate and support the healing process. Nanotechnology-based strategies—including the use of nanomaterials, nanofibers, nanoscale scaffolds, and biomaterials—offer innovative approaches to treating both acute and chronic wounds. Over the past decade, the application of nanomaterials in pharmaceutical and biomedical contexts has gained substantial attention. Many of these materials are now incorporated into products such as drug delivery systems, skin substitutes, and advanced wound dressings.

Conclusion : Despite promising laboratory results, the industrial-scale production and clinical application of nanostructured wound treatments remain limited. Continued research is essential to develop new, safe, and efficient nanomaterials that can advance the treatment of complex and severe wounds.

A Biocompatible Hydrogel Scaffold with Yarrow Extract and Curcumin Nanoparticles as a Novel Wound Dressing

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Purpose : As the body's largest organ, the skin serves a critical role in protecting against external threats and maintaining physiological homeostasis. However, chronic wounds and severe skin injuries—such as burns and diabetic ulcers—can impair the natural healing process and demand innovative therapeutic strategies. Hydrogels, with their three-dimensional polymeric network and high-water retention capacity, are emerging as promising wound dressings due to their extracellular matrix (ECM)-like structure, biocompatibility, and moisture-retaining ability. In this study, a novel hydrogel was developed incorporating yarrow extract and curcumin nanoparticles—two agents known for their antioxidant and regenerative properties. These components aim to reduce oxidative stress and stimulate the proliferation of human skin fibroblast cells, thereby enhancing wound healing.

Methods : The hydrogel was synthesized using polyvinyl alcohol (PVA) and alginate blended with curcumin nanoparticles and yarrow extract. Following synthesis, the hydrogel underwent comprehensive physical and chemical characterization, as well as *in vitro* evaluations to assess cytotoxicity, cell viability, and fibroblast migration.

Results : Results demonstrated that the hydrogel possessed suitable porosity and exhibited high biocompatibility. The inclusion of curcumin and yarrow extract significantly enhanced its biological activity, promoting fibroblast growth without inducing cytotoxic effects. These hydrogel systems can also serve as carriers for the controlled release of bioactive compounds, including plant extracts and nanoparticles.

Conclusion : This study highlights the potential of the developed hydrogel as a smart wound dressing, capable of accelerating healing and minimizing side effects. The findings pave the way for the advancement of next-generation wound care products tailored for complex and chronic wound management.



The effect of platelet rich plasma dressing on healing if burn ulcers

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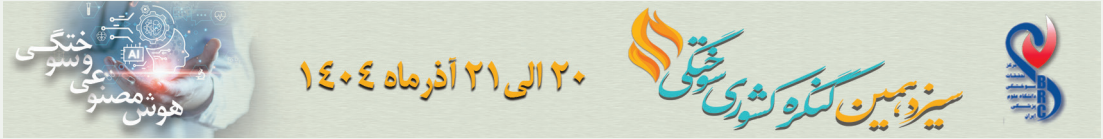
2. *tehran hospital 7 ter*

Purpose : some of the studies confirmed the effectiveness of platelet rich plasma (PRP) in the treatment of burn ulcer. However, these studies had small sample size and used different methods such as PRP gel or PRP injections. The results are also controversial.

Methods : study aimed to investigate the effect of PRP dressing on healing of burn ulcer. Patient and methods: A randomized, controlled trial was conducted on 50 patients with burn ulcers referred to Kashan's Behshti Hospital. Patients were randomly allocated to either the control (n=25) or the experimental (n=25) groups. After surgical debridement, the ulcer depth and surface area were measured. Then, the ulcer of the control group were irrigated and dressed with sterile gauzes. However, in the intervention group, the ulcer were dressed with sterile gauze impregnated with burn ulcers. The ulcers depth and surface area of all ulcers were measured on the days 0, 7, 14, and 21 after the debridement. Independent-samples T tests, Mann-Whitney U and ANOVA were used to analyze the data.

Results : At baseline, the mean ulcer depth was 15.08 ± 10.43 and 19.08 ± 14.01 mm in the control and the intervention groups respectively ($p=0.26$) which decreased to 13.03 ± 14.1 and 4.560 ± 5.076 after three weeks ($p=0.04$). Moreover, the mean ulcer surface area was 14.17 ± 8.52 and 12.791 ± 14.86 mm in the control and the intervention group respectively ($p=0.69$) which decreased to 11.88 ± 13.65 and 2.68 ± 5.94 after three weeks ($p=0/03$).

Conclusion : the effectiveness of platelet rich plasma (PRP) in the treatment of burn ulcer



Artificial Intelligence in Tissue Engineering and Burn Wound Management: A Review

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Purpose : Burn wounds demand advanced therapies to restore skin and prevent complications. Tissue engineering, using 3D-printed scaffolds, regenerates damaged tissues, while burn wound management requires precise diagnosis and monitoring. Artificial intelligence (AI) enhances scaffold design and enables in situ 3D printing onto burn-affected skin. This review assesses AI's role in tissue engineering and burn care, emphasizing AI-driven 3D printing for personalized scaffold-based treatments.

Methods : A systematic literature review was performed using PubMed, Scopus, and Web of Science, covering articles published from 2021 to 2025. Search terms included artificial intelligence, tissue engineering, 3D printing, burn wounds and wound management. Studies focusing on AI applications in burn diagnosis, treatment or scaffold design were selected. articles, including systematic reviews, experimental studies and a review on in situ 3D printing; were analyzed for this study.

Results : AI optimizes 3D-printed scaffolds for skin regeneration by predicting material properties and cellular behavior. AI-guided in situ 3D printing adapts to burn-affected skin, using biological inks to create personalized scaffolds. Convolutional neural networks (e.g., SenseBurn) classify burn depth with 96.7% accuracy. U-Net models measure wound area with 94% precision, identifying tissue types. AI-driven smart sensors monitor pH and detect infections (94.5% accuracy), supporting tailored bio-printed hydrogels for burn healing.

Conclusion : AI transforms burn care through precise scaffold design, in situ 3D printing, and real-time monitoring. Challenges like data quality and model interpretability demand standardized datasets and explainable AI. Integrating AI with bioprinting and surgical robotics offers customized skin grafts for burns. Interdisciplinary collaboration is essential to address ethical concerns and standardize protocols, unlocking AI's potential to revolutionize burn treatment and tissue regeneration.



The creation, physical and biological characteristics, and in vivo tests of a novel therapeutic hydrogel of amniotic membrane extract/oxidase carboxymethyl cellulose in wound healing

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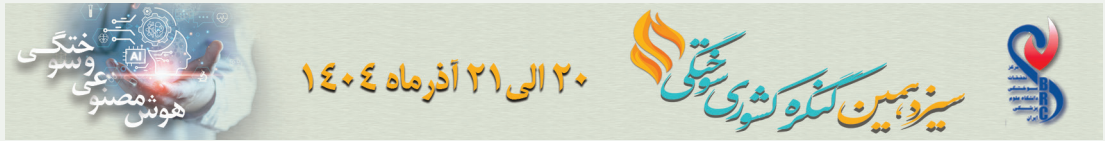
Purpose : One novel biomaterial that has been extensively studied is hydrogel wound dressing, which has a high absorbency capacity. It has been shown that using a human amnion membrane to treat wounds is both safe and efficient. However, living cellularized tissue is costly, thin membrane sheets are challenging to handle and install, and amniotic membrane wound healing products are inconvenient to use and have poor mechanical characters. A new hydrogel made from amnion membranes is described in our study.

Methods : By employing hydrogel as a wound dressing with ideal quantities of amniotic membrane extract (AME) and oxidized carboxymethyl cellulose (OCMC) through Schiff-Base interaction, we hoped to enhance wound healing in the rat model.

Results : The construct's mechanical characters, cell adhesion, swelling rate, and biodegradation all improve with higher AME concentrations. Our data suggest that OCMC10%-AME150% hydrogel supports deep wound repair well in vivo. Fully designed both in vitro and in vivo are the hydrogels biomechanical, morphological, and biocompatibility features.

Conclusion : The effectiveness of amnion membrane extracts as wound therapies and dressings is confirmed by this scaffold, which get around the limitations of employing fresh, dehydrated, or cryopreserved tissues. The OCMC10%-AME150% hydrogel is strongly recommended by this study as a superior full-thickness wound dressing that greatly enhances wound healing.

Epidermolysis bullosa (EB) and Tissue engineering



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Purpose : Epidermolysis Bullosa (EB) is a rare genetic disorder that lea

ds to the formation of blisters on the skin, affecting individuals from infancy to adulthood. Despite extensive research aimed at addressing these issues, the problem has not been fully resolved, and patients are still born with this condition worldwide. Although various dressings have been developed for individuals with EB, access to these solutions remains difficult. Therefore, we have designed a program to develop a dressing that not only protects the skin but also aids in its healing and maintenance.

Methods : The amniotic membrane was obtained from mothers who were giving birth and had passed all serological tests, ensuring the health of the fetal membrane. The membrane was then transferred to the laboratory. After the preparation process, the amniotic membrane was used as a scaffold. Stem cells derived from fetal umbilical cord were loaded onto this scaffold. These dressings were then sterilized and stored under sterile condition

Results : we observed that when the dressing was applied to an area of skin after seven days, we had epidermal layer regeneration. Furthermore, after that, blisters typically formed in the lesions of patients were no longer observed. With follow-up of the patients for up to thirty days, we found that the area did not develop new wounds.

Conclusion : In this study, we observed that when the dressing was applied to an area of skin that was damaged, after seven days, we had epidermal layer regeneration. Furthermore, after that, blisters typically formed in the lesions of patients were no longer observed. With follow-up of the patients for up to thirty days, we found that the area did not develop new wounds, and patient satisfaction was achieved.



Novel Approaches in Burn Wound Healing: The Central Role of Mesenchymal Stem Cells and Paracrine Mechanisms

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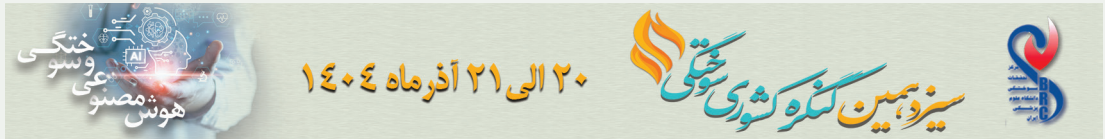
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Purpose : Burns are serious skin injuries that cause extensive tissue damage, infection, and functional impairment. Traditional treatments, though effective, often lead to severe scarring and require skin grafts. Advances in biotechnology have highlighted stem cells as a promising method for regenerating damaged tissues. Stem cells' ability to differentiate and repair has opened new possibilities for improved burn therapy.

Methods : This narrative review analyzes selected scientific literature on burn injury pathophysiology and novel treatments. The focus is on the therapeutic role of mesenchymal stem cells (MSCs) in burn wound healing. Key topics include burn epidemiology, immune and metabolic responses to trauma, and cellular and molecular mechanisms of MSCs in tissue repair and scar modulation.

Results : Evidence shows that mesenchymal stem cells have significant potential in managing burn wounds. Their effects are mainly through paracrine signaling, involving multiple mechanisms.

Conclusion : Using mesenchymal stem cells marks a shift from replacement therapies toward regenerative strategies for burn wounds. These cells offer a comprehensive approach by targeting inflammation, apoptosis, and scar formation simultaneously, improving on traditional treatments. Since MSCs mainly act via paracrine secretions, future research should isolate key components like exosomes for cell-free therapy. MSC-derived exosome treatments could offer greater safety, easier standardization, and scalable production. Combined with advanced technologies such as skin organoids, these innovations could transform burn patient care.



Evaluation of Efflux Pump Activity and Prevalence of MexAB and oprD Genes in Multidrug-Resistant *Pseudomonas aeruginosa* Isolates from Burn Patients During 2022-2021

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Purpose : *Pseudomonas* spp. due to their metabolic adaptability are found almost everywhere. Although carbapenems are the most effective antibiotics for treating multidrug-resistant (MDR) *Pseudomonas aeruginosa* infections, there has been a global rise in carbapenem-resistant isolates. Resistance often involves overexpression of efflux systems (MexAB-OprM, MexXY(-OprA)), inactivation or suppression of the OprD porin, and increased production of chromosomal AmpC β -lactamase.

Methods : This cross-sectional study included all burn patients admitted to Amir-Al-Mo'menin Hospital in Shiraz during 2021-2022. Samples such as wound tissue, blood, sputum, and urine were collected. *P. aeruginosa* isolates were identified phenotypically, and antimicrobial susceptibility testing was performed. MDR and carbapenem-resistant isolates were confirmed using the Combined disc and Modified Hodge tests. Efflux pump activity was assessed, and PCR was used to detect mexAB and oprD genes from genomic DNA. Statistical analysis was conducted using SPSS version 25.

Results : *Pseudomonas* isolates exhibited the highest resistance to piperacillin (79.6%), meropenem and amikacin (77.8%), cotrimoxazole and imipenem (75.9%), gentamicin (74.1%), ceftazidime (72.2%), and carbapenems (69.4%). Resistance to colistin was minimal at 1.9%. The mexAB gene was present in 72.2%, oprD in 41.7%, and efflux pump activity was observed in 74.1% of isolates

Conclusion : Colistin remains the most effective antibiotic against MDR *P. aeruginosa* in burn patients. Additionally, antimicrobial resistance correlates positively with increased efflux pump activity and MexAB gene prevalence, while decreasing oprD gene expression

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Antibacterial Effect of Hydroxypropyl Methylcellulose Gel Containing Bacteriophages Against *Pseudomonas aeruginosa* Isolated from Burn Patients

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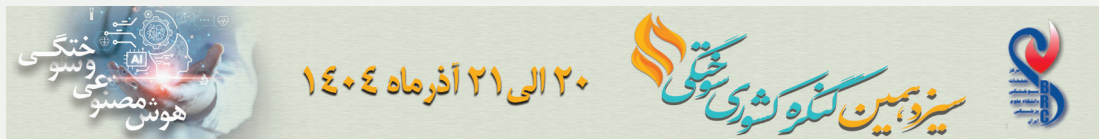
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Purpose : Burn wounds are highly susceptible to bacterial infections, especially by multidrug-resistant *Pseudomonas aeruginosa*. The increasing antibiotic resistance emphasizes the need for alternative therapeutic approaches, such as bacteriophage therapy, which uses viruses that target specific bacteria. Phages can be formulated into topical gels to treat infections effectively.

Methods : In this study, bacteriophages targeting *Pseudomonas aeruginosa* were isolated from sewage samples collected at Amir-al-Momenin Hospital. The process involved mixing samples with bacteria, incubation, filtration, and activity testing via spot and plaque assays. Phages were purified, amplified, and concentrated using PEG precipitation. The purified phages were incorporated into a hydroxypropyl methylcellulose gel. A hydroxypropyl methylcellulose (HPMC) gel containing the isolated phages was prepared and evaluated for antibacterial efficacy *in vitro*. The assays included measuring zones of inhibition and bacterial reductions against multiple MDR *P. aeruginosa* strains.

Results : The phages demonstrated broad host range activity and produced clear zones of inhibition averaging 15-20 mm. When incorporated into the HPMC gel, the phages retained their stability and activity. The gel significantly reduced bacterial populations, achieving over 6 log bacterial clearance compared to controls.

Conclusion : The findings suggest that a topical HPMC gel containing bacteriophages is a promising alternative treatment for burn wound infections caused by resistant *P. aeruginosa*. This strategy could reduce reliance on antibiotics and help combat the rise of resistant infections. Further *in vivo* and clinical studies are recommended.



Evaluation the frequency of ExoA, ExoS, ExoU, ExoY and type 3 secretion system genes in drug-resistant *Pseudomonas aeruginosa* isolated from burn patients during 2021-2022

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Purpose : This study aims to determine the prevalence of ExoA, ExoS, ExoU, ExoY and type 3 secretion system genes in drug-resistant *P. aeruginosa* isolates from burn patients in southern Iran (2021-2022), Thereby addressing a research gap due to a scarcity of prior local studies on this specific topic.

Methods : This cross-sectional study was conducted at Amir-Al-Momenin Hospital between March 2021 and March 2022. Samples were collected and cultured to identify *P. aeruginosa*. Confirmed isolates were tested for antibiotic susceptibility using disc diffusion method and CLSI 2022 guidelines. MIC assay was performed on colistin and imipenem . Bacterial DNA was extracted using a commercial kit and stored for molecular experiments. PCR was conducted using specific primers for exotoxin and type 3 secretion system genes and results were analyzed using gel doc system and SPSS software.

Results : The *exoA* gene (81.5%) and *exoT* gene (77.8%) had the highest frequencies, while the *exoS* gene (36.1%) and *exoU* gene (46.3%) had the lowest frequencies, respectively. The T3SS gene had a prevalence of 66.7%. Statistical analysis showed that presence of T3SS gene was significantly associated with increased antibiotic resistance for all antibiotics ($P < 0.001$) except for clindamycin ($P = 0.109$).

Conclusion : Most *P. aeruginosa* isolates harbor *exoA* and *exoT* genes. A significant association exists between T3SS gene possession and antibiotic resistance, emphasizing its relevance in infection management. Additional investigations are necessary to comprehend the complete impact and inform appropriate treatments.



Artificial Intelligence and the Application of Antimicrobial Peptides in the Control of Burn-Related Microbial Infections: A Scoping Review

Elnaz Vafapoor¹ *

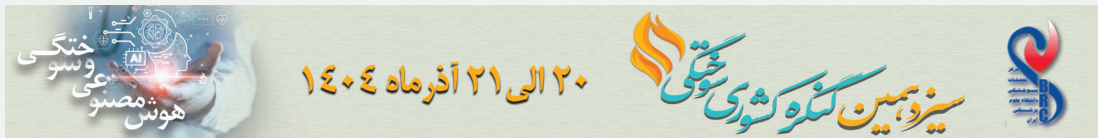
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Purpose : The discovery of peptides, due to their high chemical diversity and biological complexity, is often time-consuming and costly. Artificial intelligence (AI), utilizing advanced algorithms such as deep learning, can accelerate this process and facilitate the design of peptides with desirable properties. This review study examines the role of AI in the discovery and application of antimicrobial peptides (AMPs) for the control of burn wound infections.

Methods : This scoping review was conducted based on the framework proposed by Arksey and O'Malley. Database searches were performed in Web of Science, PubMed, ScienceDirect, Scopus, and the Google Scholar search engine using keywords such as “artificial intelligence,” “antimicrobial peptides,” “burn wounds,” and “infections.” The review covered studies published between 2010 and 2025. Inclusion criteria comprised studies that directly or indirectly addressed the application of AI in the discovery or design of AMPs for burn infections or similar wounds. Studies focusing solely on traditional antibiotics or non-AI-based methods were excluded. To organize the studies, a table was created containing information on the type of study, AI methodology, peptide type, target microorganism, and key findings. Narrative synthesis was used for data extraction and analysis. The consultation stage was omitted due to time constraints. All steps of this review were conducted in accordance with the PRISMA diagram.

Results : Ultimately, 10 studies were included for analysis. The main findings encompassed the identification of peptides through deep learning, the use of AMPs for burn treatment, the role of AI in AMP discovery and wound healing, as well as the challenges and limitations encountered.

Conclusion : Artificial intelligence, with its capacity to analyze extensive datasets and design novel molecules, holds significant potential for the discovery of antimicrobial peptides for the treatment of burn-related infections.



Assessment of Awareness, Attitude, and Performance of Nurses in Preventing Hospital-Acquired Infections in the Burn Unit of Golestan University of Medical Sciences Educational Treatment Center in Gorgan in the Year 2025

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Purpose : Infectious diseases continue to be a leading cause of global mortality. Rapidly evolving infectious pathogens and the emergence of antibiotic-resistant strains pose complex challenges for health systems. Among these, healthcare-associated infections (HAIs), especially in sensitive environments like burn units, are key contributors to mortality due to patients' vulnerability from skin barrier loss and immune weakness. Studies indicate that microorganisms can quickly spread through the hands of healthcare workers and contaminated surfaces, leading to rapid colonization of burn wounds within 24 hours. However, inadequate training of nurses in infection epidemiology, a shortage of infection control specialists, and challenges following the COVID-19 pandemic have limited the effectiveness of prevention programs. This study aims to assess the awareness, attitude, and performance of nurses in preventing hospital-acquired infections in the burn unit

Methods : This descriptive study was conducted in 1404 at the burn unit of Golestan University of Medical Sciences Educational Treatment Center. The research sample consisted of 40 nurses from the burn unit who were selected through convenience sampling. The data collection tool was a questionnaire assessing nurses' awareness, attitude, and performance regarding infection control. Data were analyzed using descriptive and inferential statistical tests

Results : The findings of this study indicated that the awareness scores of nurses regarding the prevention of hospital-acquired infections in the burn unit ranged from 47 to 80, with a mean of 67.85 ± 9.45 , indicating an acceptable level of awareness among them. Additionally, the nurses' attitude had a mean score of 36.95 ± 6.87 within a range of 18 to 47, reflecting a positive attitude among most of them. On the other hand, the performance of nurses showed a mean score of 74.30 ± 9.19 within a range of 58 to 94, indicating a relatively acceptable level of performance in preventing hospital-acquired infections.

Conclusion : results were adequate.



Comparative Effects of Mupirocin and Silver Nanoparticle Ointment versus Arnebia Euchroma Ointment on Inflammatory Markers (IL-1 β , IL-10) and Wound Healing Outcomes in Surgical and Burn Wounds in Rats.

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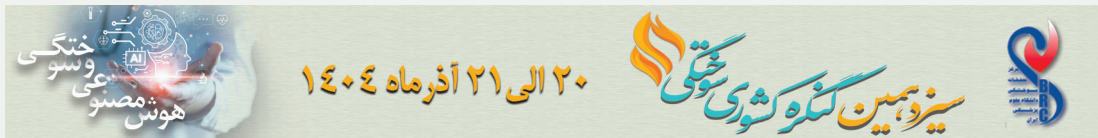
Purpose : This study aimed to compare the effects of mupirocin and silver nanoparticles ointment with Arnebia Euchroma ointment on inflammatory markers (IL-1 β and IL-10) in surgical and burn wounds in rats and to evaluate their effectiveness in reducing wound complications such as infection, scab formation, inflammation, and discharge. A controlled in vivo experimental study using a rat model to compare the effects of different ointments on inflammatory markers and wound healing.

Methods : Twelve groups of six male rats were used to create deep second-degree burn wounds and surgical wounds. Ointments containing mupirocin and silver nanoparticles (Nano) and Arnebia Euchroma (AE) extract (2% and 5%) were applied. Dressings were changed daily, and inflammation, infection, discharge, and scab formation were assessed on days 3, 7, 14, and 21. Blood samples collected on days 7 and 21 were analyzed for interleukin-1 β and interleukin-10 levels.

Results : Results: The Nano 5% ointment significantly reduced wound discharge and infection in burn wounds compared with the other groups. In surgical wounds, the Nano 2% ointment showed lower levels of discharge, infection, inflammation, and scabbing than AE 5%. Additionally, interleukin-1 β levels decreased, and interleukin-10 levels increased in the Nano 2% and AE 5% groups, indicating effective anti-inflammatory responses.

Conclusion : Conclusion: The Nano 2% is more effective than AE 5% in reducing exudation, infection, inflammation, and scabbing in surgical wounds, with minor differences. It also significantly reduced wound discharge and infection in burn wounds, indicating strong therapeutic potential.

In Vitro Antifungal Activity of Aqueous and Ethanolic Extracts of Calendula officinalis



Against Fungal Pathogens Isolated from Burn Wound Infections

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Purpose : Drug-resistant fungal infections in burn wounds are a growing clinical challenge, highlighting the need for new antifungal agents, especially those derived from natural sources. This study investigated the in vitro antifungal activity of aqueous and ethanolic extracts of *Calendula officinalis* (marigold) against fungal pathogens isolated from burn wound infections.

Methods : Using the maceration technique, aqueous and ethanolic extracts of *C. officinalis* were prepared. Antifungal activity was assessed by determining the minimum inhibitory concentration (MIC) and minimum fungicidal concentration (MFC) against various fungal isolates using the microdilution method according to CLSI standards. Tested organisms included yeast-like fungi (*Candida albicans*, *C. tropicalis*, *C. parapsilosis*, *C. krusei*, *C. glabrata*, *Trichosporon asahii*, *Rhodotorula mucilaginosa*, *R. dairenensis*) and filamentous fungi (*Aspergillus flavus*, *A. fumigatus*, *A. niger*, *Rhizopus oryzae*, *Alternaria alternata*, *Fusarium oxysporum*, *Cladosporium cladosporioides*).

Results : Yeast isolates were resistant to the aqueous extract, but all except *C. tropicalis* were sensitive to the ethanolic extract. MIC/MFC values ranged from $1/256 \times 10^3$ to $1/8 \times 10^3$ $\mu\text{g/mL}$. For filamentous fungi, only *Aspergillus* species responded to the aqueous extract, while the ethanolic extract inhibited several species, including *A. flavus*, *A. fumigatus*, *A. niger*, *R. oryzae*, and *F. oxysporum*, with MIC/MFC values ranging from $1/128 \times 10^3$ to $1/4 \times 10^3$ $\mu\text{g/mL}$. *A. alternata* and *C. cladosporioides* were resistant to both extracts.

Conclusion : The ethanolic extract of *Calendula officinalis* demonstrated notable antifungal activity against both yeast-like and filamentous fungi isolated from burn wounds. These findings support further investigation into its use as a natural alternative to conventional antifungal therapies.



Patterns of Hospital-Acquired Infections and Environmental Bacterial Contamination in a Burn Referral Center in Northern Iran: A Five-Year Surveillance Study

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Purpose : Hospital-acquired infections (HAIs) remain a major challenge in burn units due to patients' compromised immunity and prolonged hospital stays. Understanding environmental contamination and infection patterns is crucial for infection control. To evaluate the trends and bacterial profiles of HAIs and environmental contamination in Velayat Burn and Plastic Surgery Center, Rasht, Iran, over five years (2018–2022).

Methods : This cross-sectional descriptive study analyzed all positive bacterial cultures (n = 673) from hospitalized burn patients and environmental samples (n = 212) collected from various hospital units. Data on patient demographics, burn percentage, duration of hospitalization, infection onset, and outcomes were extracted from medical records. Bacterial isolates were identified and analyzed using SPSS v22.

Results : Of 212 environmental samples, the most common contaminant was fungi (41.5%), followed by *Staphylococcus* spp. (20.3%). Among the 673 patient isolates, the predominant pathogens were *Pseudomonas aeruginosa* (34.9%) and *Klebsiella* spp. (12.3%). A strong overlap was observed between environmental and patient isolates, particularly for *Staphylococcus aureus* and *Klebsiella pneumoniae*. Most infections occurred in ICU and burn units, and patients with higher burn percentages had significantly longer hospital stays and higher infection rates. The overall in-hospital mortality rate was notable among patients with multidrug-resistant infections.

Conclusion : The predominance of multidrug-resistant *P. aeruginosa* and *Klebsiella* spp. in both patient and environmental samples underscores the urgent need for enhanced infection control strategies, particularly in high-risk units. Regular environmental surveillance and stricter hygiene protocols are essential to mitigate the burden of HAIs in burn centers.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

بیرومبین کنفرانس علمی



Prevalence of Fungal Infections in Burn ICU Patients in Mashhad in 1403

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Purpose : Fungal infections are serious and life-threatening complications among burn patients admitted to intensive care units (ICUs). Due to the loss of the skin's protective barrier, compromised immunity, and frequent use of antibiotics, these patients are at high risk for opportunistic fungal infections. This study aims to investigate the prevalence and types of fungal infections in burn ICU patients in Mashhad 1403.

Methods : This cross-sectional descriptive study was conducted on patients admitted to the burn ICU in Mashhad in 1403. Clinical samples including blood, urine, wound, catheter, and respiratory secretions were collected and subjected to fungal culture. Demographic data, burn type, total body surface area (TBSA) affected, and results of microbiological tests were extracted and analyzed from patient records.

Results : Out of 227 hospitalized patients, cultures were sent for 173 individuals, among which 31.8% had at least one positive fungal culture. All positive cultures were identified as *Candida* species. Fungal growth was reported in 6.9% of blood cultures, 25.8% of urine cultures, 4.7% of wound cultures, 31% of catheter cultures, and 20.5% of tracheal aspirates. The correlation between fungal infection and variables such as age, TBSA, ICU stay duration, mortality, antibiotic therapy, and inhalation injury was assessed.

Conclusion : Fungal infections are relatively prevalent in burn ICU patients and are associated with serious complications. Continuous screening, early diagnosis, and timely initiation of antifungal therapy can play a significant role in improving clinical outcomes in these patients.



Bacterial Infection Patterns in Burn ICU Patients in Mashhad in 1403

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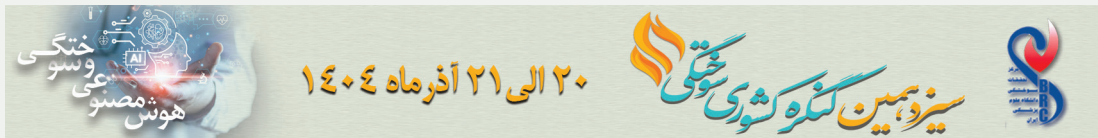
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Purpose : Bacterial infections are among the most significant causes of morbidity and mortality in patients admitted to burn intensive care units (ICUs). Due to extensive skin damage, prolonged use of catheters, mechanical ventilation, and broad-spectrum antibiotics, these patients are highly susceptible to nosocomial bacterial infections. This study aims to investigate the microbial patterns and antibiotic resistance in burn ICU patients in the year 2024.

Methods : This descriptive cross-sectional study was conducted on patients admitted to the Burn ICU of Imam Reza Hospital in Mashhad in 1403. Clinical samples including blood, urine, wound, catheter, and respiratory secretions were collected for bacterial culture and antibiogram testing. Demographic data, burn percentage, infection types, and antibiotic susceptibility were recorded and analyzed.

Results : A total of 227 patients were included in the study. Blood cultures were sent for 153 patients, with the most common organisms being *Acinetobacter baumannii* (16%), *Pseudomonas aeruginosa* (5.2%), and *Klebsiella pneumoniae* (1.9%). From 151 urine cultures, *Acinetobacter baumannii* was the most commonly isolated bacterium (4.6%). Among 147 wound cultures, *Acinetobacter baumannii* was dominant (68%). In 34 tracheal aspirates, *Acinetobacter baumannii* was again the most frequent organism (55.8%). Of the 32 catheter cultures, *Pseudomonas aeruginosa* was most prevalent (40.6%). Antibiotic resistance was analyzed, revealing *Acinetobacter baumannii* as the most resistant pathogen overall.

Conclusion : Bacterial infections are highly prevalent in burn ICU patients and the isolated pathogens show considerable antibiotic resistance, posing a major clinical challenge. Rational use of antibiotics, continuous monitoring of resistance patterns, and stringent infection control measures are essential for improving patient management and outcomes.



Antibacterial, anti-biofilm and anti-efflux pump activity of Green Synthesized capparid spinosa Silver Nanoparticles (Gcs-AgNPs) against Pseudomonas aeruginosa and Acinetobacter baumannii

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Purpose : Acinetobacter baumannii and Pseudomonas aeruginosa have emerged as superbugs due to their high levels of antibiotic resistance, including resistance to colistin, a last-resort antibiotic. Efflux pumps and biofilm formation are critical mechanisms contributing to this resistance. The urgent need for new therapeutic strategies prompted us to investigate the antibacterial effects of green-synthesized silver nanoparticles (Gcs-AgNPs) against these resistant pathogens.

Methods : Green silver nanoparticles were synthesized using environmentally friendly methods and characterized via UV-vis spectrophotometry, TEM, SEM, FTIR, and XRD. Clinical isolates of A. baumannii and P. aeruginosa were obtained, and their efflux pump activity and biofilm-forming ability were assessed. The antibacterial activity of Gcs-AgNPs against MDR and standard strains was evaluated through agar well diffusion, MIC, and MBC assays. Effects on efflux pump activity and biofilm formation were also measured.

Results : The Gcs-AgNPs exhibited polymorphic shapes, mostly spherical, with an average diameter of 50 ± 5 nm. The nanoparticles demonstrated strong antibacterial activity against both MDR and standard strains, significantly inhibiting bacterial growth. Additionally, Gcs-AgNPs markedly reduced efflux pump activity and biofilm formation, indicating their potential to interfere with key resistance mechanisms.

Conclusion : Green synthesized silver nanoparticles effectively inhibit A. baumannii and P. aeruginosa, including multidrug-resistant strains. They can suppress biofilm formation and efflux pump activity, suggesting that Gcs-AgNPs hold promise as alternative therapeutic options against these challenging bacterial infections.



Comparison of graft edge scar scores and related indicators in the use of simple continuous suture and stapler in the burn surgery area

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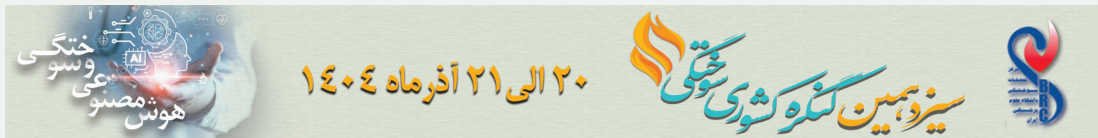
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10. *MSc Student in Operating Room, Student Research Committee,*

Purpose : The improvement of graft edges can play an important role in improving performance and beauty

Methods : on a randomized trial study that was performed in Sari 60 patients who were subjected to closing the edge of the wound with suture and stapler. The studied variables are completed at 10 cm from the edges of the wound. Scar Vancouver Questionnaire in one and three postoperative months of surgery

Results : the mean age of patients under this study was $18.67 \pm 44.63 \pm$. In terms of age, weight, height, and body mass index, location pruritus, local infection, graft loss between the two groups did not differ significantly ($P\text{-value} > 0.05$). Independent t-test at the end of the first and third months showed a difference in the score of the scores of the mean There was a higher stapler group score. The results of the paired t-test showed that changes in the scores of the scores inside each of the groups are also significant. Closing the edge of the graft in the stapler group in all groups of associated groups compared to the suture is lower ($P\text{-value} < 0.05$).

Conclusion : the variables of the group (stapler / suture) of the graft location, the time measurement of the scores had a significant relationship with the scores of the scar. The scores of the scar in the nylon stitch group is less than the Stapler group. It was not significant at the end of the third month. The patients who had graft in the area had a lower scores (1.45) of the patients with graft and varying variables were not significant.



Investigation of the Frequency and Related Factors on the Amount of Transfusion in Patients with Severe Burns: A Retrospective Cross-Sectional Study

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Purpose : Severe burn injuries often require complex interventions, including blood transfusions. Understanding the frequency and associated factors of transfusion volume is crucial for optimizing blood management and reducing complications. This study investigated these aspects in severe burn patients admitted to a burn center in Northern Iran in 2023--2024.

Methods : This retrospective cross-sectional study included 112 hospitalized severe burn patients. We extracted demographic and clinical data from patient records, including age, gender, BMI, TBSA, burn depth, inhalation injury, infection, number of surgeries, ICU stay length, and volume of blood transfused. Data analysis used statistical tests and multivariate logistic regression.

Results : Blood transfusions were administered to 46.4% of patient with a median of 2 units transfused. RBCs were most common (96.2%), followed by FFP (32.7%). Mean transfused units were higher in patients with comorbidities, flame/fire burns, head/neck burns, inhalation injuries, third-degree burns, infections, ICU admissions, and deceased patients. Multivariate logistic regression showed third-degree burn severity, number of surgical procedures, and length of ICU stay significantly associated with increased transfusion likelihood. Third-degree burn patients were ~6 times more likely to need transfusions. Each additional day in ICU increased transfusion probability by 55%; each extra surgery increased it by 80%.

Conclusion : Our findings show a substantial need for blood transfusions in severe burn patients, with volume significantly influenced by burn extent/depth, ICU stay duration, and number of surgeries. These results highlight the importance of tailored protocols, precise transfusion criteria, and optimized blood resource management to improve outcomes and minimize complications for this vulnerable population.



Prevention and Treatment of Burn Scars Using the First Iran-Approved PRP Gel-Based Kit: A Clinical Evaluation

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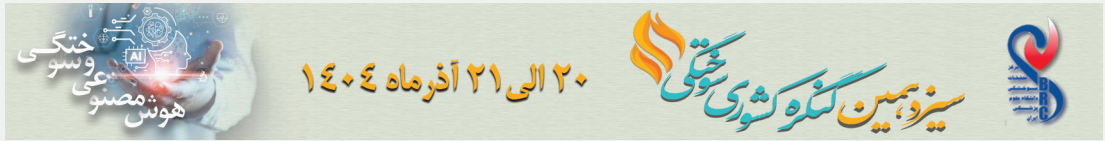
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Purpose : Scar formation is a common complication following burn injuries, often resulting in functional limitations and aesthetic concerns. Effective strategies for both prevention and treatment of scars remain a key focus in burn care. Platelet-Rich Plasma (PRP), rich in growth factors, has shown regenerative and anti-inflammatory properties. PRP is a promising adjunct in scar management practice, offering both preventive and therapeutic benefits in burn care. This study evaluates the clinical performance of a novel PRP gel-based kit—developed and ISO 10993-certified in Iran by Raman Teb spadan—for both prevention and treatment of burn-related scars.

Methods : In this prospective study, 40 patients (aged 18–60) with recent or established second- and third-degree burns were enrolled. PRP gel was prepared using the newly approved Iranian kit, which has passed all required ISO 10993 biocompatibility tests. For prevention, the gel was applied immediately after wound closure. For treatment, it was used on mature hypertrophic and atrophic scars. Applications were performed every two weeks for six sessions. Scar quality was assessed using the Vancouver Scar Scale (VSS), patient satisfaction scores, and ultrasound-based evaluation of dermal thickness over a 3-month period.

Results : Significant improvements were observed in both groups. Preventive use of PRP gel led to reduced incidence and severity of hypertrophic scarring, while therapeutic use showed a 42% reduction in VSS scores ($p < 0.001$). Over 85% of patients expressed satisfaction with the outcomes. Ultrasound imaging confirmed enhanced dermal structure in treated areas. No adverse effects were reported, supporting the product's safety.

Conclusion : The PRP gel treatment using Iran's first ISO-approved kit by Raman Teb Spadan offers a promising, biocompatible, and cost-effective approach for both preventing and treating burn scars. Its ease of use, safety profile, and clinical efficacy support its integration into standard burn care protocols.



A Review of the Nurse's Role in the Prevention and Management of Post-Burn Scars: From Theory to Practice

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Purpose : Burn injuries are among the most common health-related traumas and, if not managed properly, can lead to permanent scarring as well as functional and psychological impairments in patients. Nurses, due to their continuous presence in the care setting of burn patients, can play a significant role in the prevention, early detection, and management of burn-related scars. The aim of this review article is to examine the role of nurses in the prevention and management of burn scars and to outline practical, evidence-based strategies.

Methods : This study was conducted as a Narrative Review. To collect data, reputable databases including PubMed, Scopus, ScienceDirect, CINAHL, and Google Scholar were searched. The search was performed using Persian keywords and their English equivalents, including: "nursing," "burn," "scar," "post-burn nursing care," "scar prevention," "rehabilitation," "hypertrophic scar," and "wound healing." The search period covered articles published from 2010 to 2024. After removing duplicates and irrelevant articles, a total of 42 eligible studies that met the inclusion criteria in terms of subject relevance and scientific quality were included for content analysis.

Results : The review of the articles showed that preventive nursing interventions include proper positioning, early mobilization, use of pressure dressings, and moisturizers. Continuous assessment of the wound healing process, timely referral, and follow-up of pharmacological or surgical treatments are also key nursing responsibilities. Active participation in rehabilitation and collaboration with the physiotherapy team are effective in preserving motor function. Moreover, psychological support and patient education alongside physical care improve quality of life and reduce anxiety caused by scarring.

Conclusion : By leveraging their specialized knowledge and interdisciplinary collaboration, nurses can play a critical role in reducing complications associated with burn scars. Strengthening nursing education in the areas of wound healing and post-burn care is an effective step toward improving care quality and enhancing patient outcomes.

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Evaluating the Evidence on Post-Burn Scar Prevention and Treatment: A Critical Review of Strengths, Gaps, and Future Directions

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Purpose : Scar formation is a serious complication following burn injuries, leading to long-term functional consequences. However, there is currently a lack of widely accepted guidelines for the prevention and management of post-burn scars. Therefore, this study aimed to analyze the current literature and guidelines related to post-burn scars, emphasizing their key strengths and limitations.

Methods : This review study follows the PRISMA review guideline and is defined in five stages, including: identifying the research question and relevant studies, study selection, data extraction, summarizing and synthesizing the results. Databases (PubMed, CINAHL, Scopus, ERIC, SID, Irandoc and PsycINFO) searched systematically using (MESH) keyword, including burn scars, hypertrophic scars, keloid, cicatrix, burn hypertrophic scars, burns keloid, and nursing. Articles published in both English or Persian language retrieved without time limitation.

Results : Initially, a total of 4826 records identified. Duplicated records removed and 257 records screened by title and abstract. 55 full text evaluated and finally 18 eligible articles included in the final review. According to the results, there has been limited research conducted on both descriptive and interventional studies related to scar formation. The first category of these studies, which is limited in number, investigates the prevalence of post-burn scars. Most of these studies are retrospective, relying on electronic health records, which often pose limitations concerning the accuracy and integrity of the information. They frequently report lower prevalence rates than previously anticipated across various groups. The second category, are studies exploring various intervention methods to prevent or treat scars. Nevertheless, due to differences in healthcare systems, the absence of validated measurement tools, and notable discrepancies in results, the findings remain inconsistent.

Conclusion : Consequently, it is recommended to conduct both descriptive and clinical trial studies involving maximum diversity of patients' gender, age, ethnicity to identify the best



Smart Wound Monitoring Sensors for Early Detection of Infection in Burn Patients: A Systematic Review

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Purpose : Burn wound infections are a major cause of morbidity and mortality, necessitating early detection to prevent complications such as sepsis and delayed healing. Traditional diagnostic methods often lack real-time monitoring capabilities, highlighting the need for advanced technologies like smart sensor systems. This systematic review aims to evaluate the efficacy of smart sensor technologies in detecting early signs of infection in burn wounds, focusing on their accuracy, clinical applicability, and potential challenges.

Methods : Following PRISMA guidelines, a comprehensive literature search was conducted in PubMed, Scopus, and Web of Science (2010–2024) using keywords such as “smart wound sensors,” “burn infection,” and “early detection.” Out of 1,245 initially identified records, 312 duplicates were removed. After title/abstract screening, 145 articles underwent full-text review, with 87 excluded due to irrelevant outcomes or insufficient clinical data. A final set of 58 studies was included for qualitative synthesis.

Results : Smart sensors (e.g., biosensors, IoT-enabled dressings) demonstrated high diagnostic accuracy (>85%) in detecting infection markers (pH, temperature, inflammatory cytokines). Clinical trials (n=12) reported significantly reduced time-to-diagnosis (24–48 hours faster than conventional methods) and improved antibiotic use. Key limitations included sensor biocompatibility and cost barriers in resource-limited settings.

Conclusion : Smart sensor technologies offer a promising, non-invasive approach for real-time infection monitoring in burn care. Further large-scale clinical validation is needed to optimize their integration into standard practice.



Application of Big Data and Artificial Intelligence: A New Paradigm in Comprehensive Burn Care

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Purpose : Burn injuries require multidisciplinary management spanning prevention, acute care, and long-term rehabilitation. Despite advances, challenges persist in predicting outcomes, personalizing treatments, and optimizing resource use. This review examines how big data analytics and artificial intelligence (AI) are reshaping burn care by integrating diverse data sources to improve decision-making, reduce complications, and enhance patient recovery.

Methods : A systematic review was conducted using PubMed, Scopus, and Web of Science (2018–2023). Search terms included “burn care,” “AI,” “machine learning,” “big data,” “rehabilitation,” and “predictive modeling.” Inclusion criteria prioritized peer-reviewed studies, clinical trials, and meta-analyses addressing AI or big data applications in burn management. Out of 450 initial results, 68 studies met eligibility criteria. Data were analyzed thematically to identify innovations, clinical impacts, and implementation barriers.

Results : 1. Prevention: AI models analyzing socioeconomic and environmental data (e.g., household hazards) reduced burn incidence by 15–20% in high-risk populations. 2. Acute Care: Deep learning algorithms improved burn depth assessment accuracy (92% vs. 78% for human clinicians) and predicted sepsis risk 48 hours earlier than traditional methods. 3. Rehabilitation: Wearable sensors combined with AI enabled real-time adjustments to physiotherapy, shortening recovery time by 25% in severe cases. Key challenges included data fragmentation, algorithmic bias, and limited interoperability of health systems.

Conclusion : Big data and AI hold transformative potential for unifying fragmented burn care practices into a cohesive, patient-centric framework. Successful implementation requires addressing ethical concerns, improving data standardization, and fostering collaboration between clinicians and data scientists. Future research should prioritize real-world validation and equity-focused AI tools.



Artificial Intelligence in Advanced Burn Care: Infection Prediction and Personalized Pain Management

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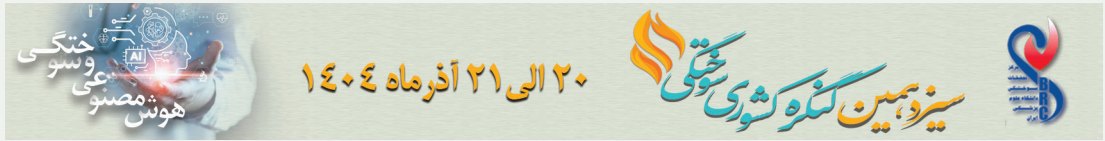
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Purpose : Infection and pain are major challenges in the care of burn patients, leading to prolonged hospitalization, secondary complications, and reduced quality of life. In recent years, artificial intelligence (AI) has emerged as an effective tool for predicting wound infection and designing personalized pain management protocols. This study aims to systematically review and meta-analyze the effectiveness of AI models in this field.

Methods : A systematic review and meta-analysis were conducted following PRISMA guidelines. Searches were performed in PubMed, Scopus, Web of Science, and IEEE Xplore from 2012 to 2024 using relevant keywords. Out of 634 retrieved articles, after screening and removing duplicates and low-quality studies, 19 studies were included: 12 based on machine learning and 7 on deep learning. Data were analyzed using RevMan 5.4 with a random-effects model, and heterogeneity was assessed using the I² index.

Results : AI models, including Random Forest, Support Vector Machine, XGBoost, and deep neural networks (CNN, RNN), using clinical and demographic data, predicted wound infection with a sensitivity of 89% and specificity of 85%. Some models detected infection before the onset of clinical signs. Additionally, in pain management, models accurately predicted pain intensity and proposed personalized pharmacological protocols, resulting in an average reduction of 1.8 points in pain scores and decreased opioid consumption. Application of these models reduced the mean hospital stay by 2.5 days and decreased complications such as sepsis. Heterogeneity among studies for infection and pain prediction was 47% and 58%, respectively.

Conclusion : AI algorithms are effective for early prediction of infection and personalized pain management, potentially improving the quality of care and outcomes in burn patients. Further large-scale studies and development of localized models are recommended for better generalizability.



The Post-Antibiotic Era in Burn Medicine: Innovations in Infection Control and Therapeutic Alternatives

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Purpose : Burn wound infections remain a leading cause of morbidity and mortality. The emergence of multidrug-resistant (MDR) and extensively drug-resistant (XDR) organisms such as *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, and *Klebsiella pneumoniae* has severely limited antibiotic effectiveness, demanding novel approaches to infection control. To highlight recent advances in burn infection management, with a focus on non-antibiotic therapies and modern antiseptics.

Methods : A systematic review of studies published between 2019 and 2024 was conducted via PubMed, Scopus, and Web of Science, covering antimicrobial resistance, phage therapy, nanomedicine, antimicrobial peptides (AMPs), and modern topical antiseptics.

Results : Resistance to last-line antibiotics is rising, particularly in burn ICUs. In response, new strategies are emerging. Bacteriophage therapy shows promise against biofilm-forming pathogens. AMPs like LL-37 and melittin analogs provide broad-spectrum activity with low resistance risk. Nanoparticles enhance drug delivery and penetration. Photodynamic therapy and AI-based infection monitoring are also advancing. Topical antiseptic use is evolving. Traditional agents such as silver sulfadiazine and povidone-iodine are being replaced due to cytotoxicity and limited efficacy. Modern alternatives—like Octenidine dihydrochloride (OCT) and hypochlorous acid—offer potent antimicrobial action with excellent tissue compatibility. OCT is fast-acting and effective against MDR pathogens with minimal toxicity. Hypochlorous acid, a naturally derived agent, is safe and effective for wound cleansing. Nanocrystalline silver further improves antimicrobial coverage and wound healing.

Conclusion : In the face of rising resistance, combining modern antiseptics with innovative therapeutics such as phages, AMPs, and nanotechnology offers a robust, sustainable strategy for infection control in burn care.



Title:

Utilizing Explainable Artificial Intelligence (XAI) for Early Detection of Infection in Burn Wounds: A Systematic Review

Subject:

کاربرد هوش مصنوعی و کلان داده ها در پیشگیری، درمان و بازتوانی

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Abstract Original Research

Background and Objective:

Infection of burn wounds can lead to serious complications. Traditional clinical methods and microbial cultures are time-consuming and sometimes inconclusive. The emergence of Explainable Artificial Intelligence (XAI) offers promise in elucidating complex models; however, its application for early detection of burn wound infections has not been systematically investigated.

Material and Methods:

This study was conducted systematically in accordance with PRISMA guidelines. We searched PubMed, Scopus, Google Scholar, and EMBASE without any temporal restrictions using keywords related to artificial intelligence and burn wound infection.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

پژوهش‌های علمی و تحقیقاتی



Studies that employed XAI techniques such as SHAP, LIME, and Grad-CAM for predicting or diagnosing infection in burn wounds—whether interventional trials, clinical trials, quasi-experimental designs, or systematic reviews performed in prehospital or hospital settings—were included. Ultimately, five articles met the inclusion criteria and were analyzed.

Findings:

Evidence regarding the use of XAI for detecting burn wound infections is limited; however, related studies demonstrate considerable potential—for instance, an XGBoost model was utilized to predict post-burn sepsis, identifying fibrinogen level, neutrophil-to-lymphocyte ratio, body mass index, and age as the most important predictors, while another model based on hospital big data and analyzed with SHAP revealed burn extent, white blood cell count, and patient age as the most influential factors, and, in the imaging domain, a hybrid XAI-based framework for burn depth classification achieved over 80% accuracy—suggesting potential for generalization toward infection detection.

Conclusion:

Although XAI shows promise in interpreting predictive models for burn-related complications, there is no systematic review of its application for early detection of burn wound infections. Future research should focus on integrating clinical and imaging data using transparent AI methods to enhance diagnostic accuracy and trust.

Keywords:

Explainable Artificial Intelligence, Burn Wound Infection, SHAP, Sepsis Prediction, Machine Learning



Emerging Technologies in Burn Rehabilitation: Applications of Virtual Reality, Robotics, and 3D Printing

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Purpose : Burn rehabilitation is a complex phase of treatment often associated with chronic pain, limited mobility, and psychological challenges. Recently, advanced technologies such as Virtual Reality (VR), wearable robotics, and 3D printing have been introduced as adjuncts to traditional rehabilitation. These tools aim to enhance patient engagement and deliver personalized care to improve therapeutic outcomes.

Methods : This systematic review followed PRISMA guidelines. Databases including PubMed, Scopus, Google Scholar, and EMBASE were searched using keywords like “Virtual Reality,” “Robotics,” “3D Printing,” and “Burn Rehabilitation.” Ten studies—including randomized trials, case reports, systematic reviews, and observational studies—were selected. Outcome measures included range of motion, hand function, pain and anxiety reduction, and patient satisfaction.

Results : VR was the most frequently applied technology, showing significant improvements in motor function (SMD up to 0.72), pain reduction (SMD up to -1.26), and anxiety (SMD -0.73). 3D-printed robotic devices improved object manipulation in patients with severe motor impairments. Combined with telemedicine, 3D printing proved cost-effective (under \50) and achieved over 90% patient satisfaction in resource-limited settings. Augmented reality interventions also improved quality of life and motor outcomes in the short term. In some cases, VR-assisted gait training reduced pain and enhanced cerebral blood flow. Patients also reported higher adherence and enjoyment during therapy.

Conclusion : Innovative technologies—especially VR, 3D-printed robotics, and telemedicine—are promising complements to conventional burn rehabilitation. By enhancing physical and psychological recovery while reducing costs, these tools have the potential to redefine standard care. However, further long-term, prospective studies are needed to support broader adoption.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

نیزه‌مین کنفرانس علمی



From Image Analysis to Prognosis: How AI is Transforming Burn Wound Assessment – A Narrative Review

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Purpose : Burn injuries represent a major global health challenge, requiring accurate and timely assessments for effective treatment. Traditional clinical evaluations are subjective and prone to inaccuracies, while advanced technologies like Laser Doppler Imaging are often costly and inaccessible. This review explores recent research highlighting the potential of Artificial Intelligence (AI) and Machine Learning (ML) to transform burn wound assessment and healing prediction, addressing these limitations.

Methods : A comprehensive search was performed in PubMed (n=22), Google Scholar (n=41), and web of science (n=16) using the keywords “Artificial Intelligence,” “Machine Learning,” “Deep Learning,” “burn wound,” “healing,” and “assessment” limited to original articles published from 2021 to 2025. Studies on AI’s application in burn wound assessment and healing prediction were included. The search concluded on June 5, 2025, and 13 studies were selected after removing duplicates and screening.

Results : AI tools show impressive accuracy: Convolutional Neural Networks with Boundary Attention Mappers achieve 91.6% accuracy in burn delineation and 67% agreement with Laser Doppler Imaging for depth. Terahertz Time-Domain Spectroscopy with neural networks predicts wound healing outcomes with 94.7% accuracy, one hour after the burn. Gradient-Boosted Decision Trees show high accuracy (AUC ~0.85) in predicting chronic wound healing times. The Skin Abnormality Tracking Algorithm enables effective remote wound monitoring. Additionally, large language models show potential for providing comparable assessments and management plans to clinicians, assisting in rapid triage.

Conclusion : AI-driven solutions can enhance clinical decision-making by offering objective, accessible, and precise tools for burn care. Although challenges related to data diversity, ground truth definition, clinical integration, and ethical issues remain, ongoing research demonstrates AI’s significant potential to improve burn wound assessment, resource allocation, and patient recovery.



Machine Learning-Based Personalized Rehabilitation Programs for Burn Patients

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Purpose : Burn injuries often require extensive rehabilitation to restore physical function and quality of life. Traditional one-size-fits-all approaches may not address individual patient needs effectively, creating demand for personalized solutions powered by machine learning (ML) technologies. This systematic review evaluates the efficacy, implementation, and outcomes of ML-driven personalized rehabilitation programs for burn survivors.

Methods : Following PRISMA guidelines, we searched PubMed, IEEE Xplore, and Cochrane Library (2015-2023) using terms including “burn rehabilitation,” “machine learning,” and “personalized medicine.” From 872 initial records, 214 duplicates were removed. After screening titles/abstracts, 143 articles underwent full-text review. We excluded 89 studies for irrelevance or insufficient ML focus, retaining 54 studies meeting inclusion criteria (32 technical developments, 18 clinical trials, 4 reviews).

Results : ML algorithms demonstrated 82-91% accuracy in predicting optimal rehabilitation pathways by analyzing burn severity (23 studies), motion patterns (17 studies), and recovery biomarkers (14 studies). Wearable-integrated systems (19 studies) reduced rehabilitation duration by 18-27% compared to conventional methods. Three randomized trials showed significantly better functional outcomes ($p < 0.05$) in ML-guided groups. Major challenges included data standardization (31 studies) and clinical adoption barriers (22 studies).

Conclusion : ML-enabled personalization shows strong potential to optimize burn rehabilitation but requires more multicenter validation. Future research should address interoperability and ethical considerations in AI-assisted care.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

نیرزمین کنکور شورای سنجشی



Evaluating the Effectiveness of Modern Machine Learning and Artificial Intelligence Technologies in Enhancing Rehabilitation Efficiency for Children with Acute Burns: A Systematic Review

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Purpose : Burn injuries in children often result in long-term physical and psychological complications. Modern technologies such as machine learning (ML) and artificial intelligence (AI) have emerged as innovative tools in medical rehabilitation. These technologies can potentially enhance therapeutic interventions, personalize care, and improve overall recovery outcomes. This systematic review aims to assess the effectiveness of ML and AI-based interventions in improving rehabilitation efficiency in pediatric burn patients.

Methods : A systematic search was conducted in databases including PubMed, Scopus, and Google Scholar using keywords such as “Machine Learning”, “Artificial Intelligence”, “Burn Rehabilitation”, and “Pediatric Burn Injuries”. The search focused on studies published within the past five years. Inclusion criteria included original studies in English involving children with acute burns and the application of AI or ML in their rehabilitation process. Articles were screened and appraised using PRISMA guidelines and quality assessment tools. Gray literature was also reviewed to ensure comprehensiveness.

Results : Out of 63 identified articles, 22 met the inclusion criteria. Studies demonstrated that AI and ML applications significantly improved rehabilitation outcomes such as motor function recovery, pain management, psychological support, and treatment personalization. Notable improvements were observed in adherence to therapy, early detection of complications, and caregiver engagement. However, some studies highlighted limitations such as ethical concerns, data privacy issues, and unequal access to technology.

Conclusion : The findings suggest that ML and AI have promising roles in enhancing pediatric burn rehabilitation. Integration of these technologies can lead to more effective, individualized, and accessible care. Future research should address current limitations and focus on the ethical application of these tools in clinical settings.



Application of Deep Learning in Predicting Severe Burn Complications: A Systematic Review

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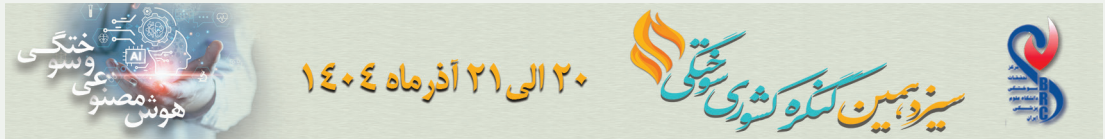
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Purpose : Predicting complications of severe burns (e.g., sepsis, organ failure, mortality) is critical for improving clinical outcomes. Advances in artificial intelligence, particularly deep learning (DL), offer new opportunities to analyze complex clinical data for accurate prediction. This systematic review evaluates the efficacy of DL models in forecasting burn-related complications.

Methods : We searched PubMed, Scopus, Web of Science, and Google Scholar (2018–2024) for English/Persian articles using keywords: Deep Learning, Burn Complications, and Prediction Models. Inclusion criteria required full-text availability and a focus on DL applications in burns. Two independent researchers conducted the search, resolving discrepancies via consensus. Study quality was assessed using PRISMA guidelines.

Results : Of 312 identified articles, 18 met inclusion criteria. DL models (e.g., CNN, LSTM) achieved 87–94% accuracy in predicting sepsis and acute kidney injury, leveraging clinical parameters (burn severity, lab tests) and imaging data. Integration of DL with electronic health records (EHR) reduced prediction errors compared to conventional tools (e.g., SOFA Score).

Conclusion : DL shows promise for early prediction of burn complications. However, further clinical validation and addressing challenges like model interpretability (Explainable AI) are needed. We recommend embedding these tools in clinical decision-support systems.



Integrating Artificial Intelligence to Empower Nursing Students in Burn Wound Management and Clinical Practice

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Purpose : Burn trauma and managing the survivals became as a major challenge in the Iran healthcare sector. It is essential for nursing students to acquire the required knowledge and skills to manage such cases. Artificial intelligence (AI) supported technologies can provide effective platforms. As there is limited understanding of existing studies in this area, this review aimed to analyze current literature, emphasizing their key strengths and limitations.

Methods : This review study adheres to the PRISMA review guideline and was conducted in five stages, including identifying the research question and relevant studies, study selection, data extraction, summarizing, and synthesizing the results. Databases (PubMed, CINAHL, and Scopus) were searched systematically using MESH keywords, including artificial intelligence, nursing education, burn wound management, and clinical simulation. Articles published in both Persian and English over the past ten years were searched.

Results : A total of 1875 articles were retrieved. 957 titles and abstracts screened according to inclusion criteria. 45 full-text articles evaluated, and finally 21 eligible articles included in the final review. Findings indicate that AI-supported technologies, like deep learning and machine learning, significantly assists nursing students in simulating clinical environments, thereby enhancing their clinical reasoning and decision-making skills before entering real practice settings. Therefore, numerous educational modules employing AI-supported technologies have been developed to train students in various fields. However, the current literature on burn wounds and AI is mostly focused on development of caring algorithms, with limited focus on educational tools and their effectiveness in training students.

Conclusion : It is recommended to explore AI-based educational modules, including interactive simulations, assessments of AI-supported learning on clinical skills, ethical and legal considerations, and promoting interdisciplinary collaboration in AI.



AI enhances burn care by improving diagnosis, treatment, and rehabilitation, yielding better physical, psychological, and social outcomes, though limited in scope, requiring further research and ethical frameworks.

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Purpose : Burn injuries remain a major global health challenge, with 11 million cases annually and 90% occurring in low- and middle-income countries. In Iran, burn incidence is eight times the global average, resulting in significant physical, psychological, and social burdens. Despite improved survival rates, many survivors experience motor limitations, PTSD, and social isolation. This review explores how artificial intelligence (AI) and big data technologies transform burn care—enhancing diagnosis, treatment, prevention, and especially rehabilitation across motor, mental, and social domains.

Methods : A comprehensive search was conducted in PubMed, SID, Civilica, Google Scholar, and PMC, using Persian and English keywords such as “artificial intelligence,” “burns,” “rehabilitation,” and “PTSD.” No time restrictions were applied. Studies included clinical and observational research reporting quantitative outcomes (e.g., accuracy, range of motion improvement). Forty-two relevant articles were selected for analysis.

Results : Motor rehabilitation: AI-powered virtual reality significantly improved range of motion (SMD = 0.72; 95% CI: 0.37–1.08; $p < 0.01$), and wearables enabled real-time progress tracking. Psychological support: AI models analyzing speech and text predicted PTSD with up to 90% accuracy. Chatbots helped monitor mental health and deliver timely interventions. Social reintegration: VR environments and AI-driven avatars supported social skill rebuilding, especially where access to therapists is limited. Prevention: Big data identified high-risk groups, and AI-integrated mobile tools supported early burn assessment and triage.

Conclusion : AI offers transformative potential in burn care by improving diagnostic precision, personalizing rehabilitation, and reducing long-term complications. However, current models face limitations in generalizability and ethical oversight. Future research should validate AI tools clinically, expand applications like smart dressings and AI therapists, and establish ethical frameworks to ensure safe integration into burn care systems.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

نیزه بین کشور شوی سنجی



Innovative Applications of Artificial Intelligence in Burn Care: A Comprehensive Systematic Review and Meta-Analysis

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Purpose : The expanding influence of artificial intelligence (AI) necessitates that healthcare professionals develop a working knowledge of machine learning (ML) principles for clinical application. In burn care, AI technologies are increasingly utilized to improve diagnostic accuracy and patient management. This systematic review and meta-analysis comprehensively assess the current state of AI-supported approaches in the evaluation of burn injuries.

Methods : A total of 47 studies published between 1990 and 2025 were systematically identified, with 12 studies included in the diagnostic test meta-analyses.

Results : The findings reveal that AI models, predominantly neural networks, demonstrate high accuracy rates ranging from approximately p to 95.4% for depth and 99.4% for segmentation. Mortality predictions also showed high potential (above 90%). Sensitivity and specificity metrics also indicate robust performance in detecting burn severity and predicting outcomes. Despite promising results, significant heterogeneity in study designs and methodologies was observed, limiting the generalizability of findings

Conclusion : The review highlights the potential of AI as a valuable adjunct in clinical decision-making for burn patients. However, it underscores the necessity for standardized research protocols and further validation to establish clinical utility.



Application of Artificial Intelligence in the Rehabilitation of Burn Patients: A Systematic Review

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Purpose : Rehabilitation in burn patients is vital for restoring motor function, enhancing quality of life, and minimizing long-term disabilities. Artificial intelligence (AI), with its capacity to analyze complex datasets and tailor individualized treatments, offers substantial potential to advance burn rehabilitation. Despite numerous studies exploring AI's role in this domain, its applications remain inadequately systematically categorized. This review aims to synthesize existing AI applications in burn patient rehabilitation and assess their impact on physical and psychological recovery outcomes.

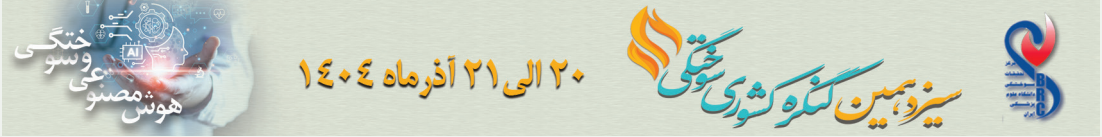
Methods : Following PRISMA guidelines, a comprehensive literature search was conducted across PubMed, Scopus, Google Scholar, and EMBASE, with no date restrictions up to 2025. Keywords included AI, rehabilitation, physiotherapy, limb mobility, wound management, machine learning, robotics, decision support systems, and burn care. A total of 10 English-language studies—intervention, quasi-experimental, and clinical trials—meeting inclusion criteria were selected. Study quality was evaluated using the Cochrane Risk of Bias tool.

Results : AI algorithms support burn rehabilitation through continuous monitoring of patient progress, pain management, and psychological support. Digital platforms and mobile applications enable patients to self-report physical and mental states, triggering alerts for abnormal changes. Virtual reality (VR) environments serve as effective tools for pain and stress reduction during recovery phases. Machine learning models analyze patient data to generate tailored physiotherapy protocols, while robotic and smart devices improve movement precision and facilitate faster functional recovery. Integrating patient-reported outcomes with AI algorithms allows the design of personalized, adaptive rehabilitation programs that shorten recovery times and enhance life quality. These systems assist clinicians in refining treatment plans and empower patients to actively participate in their rehabilitation process.

Conclusion : AI introduces innovative, adaptable tools capable of significantly improving burn rehabilitation care. Nonetheless, extensive research is needed to evaluate long-term benefits and promote user-friendly technological solutions. Advancing AI integration—coupled with clinical expertise—can substantially improve therapeutic outcomes and support patients' reintegration into daily life.

Review Article: The Application of Artificial Intelligence in Burn Prevention

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Purpose : Burn injuries are a significant global health concern, leading to severe morbidity and mortality. Artificial intelligence (AI) has emerged as a promising tool for improving burn prevention strategies. This review explores the role of AI in predicting, assessing, and preventing burn incidents, aiming to highlight its potential in reducing burn-related risks.

Methods : A systematic literature search was conducted using databases such as PubMed, Scopus, and IEEE Xplore. Keywords included “artificial intelligence,” “burn prevention,” “machine learning,” and “predictive modeling.” Studies published between 2015 and 2023 were analyzed to evaluate AI applications in burn risk assessment, early detection, and prevention.

Results : AI technologies, including machine learning and computer vision, have been utilized to: Predict high-risk scenarios – AI models analyze environmental and behavioral data to identify burn-prone situations. Early diagnosis – Image-based AI systems classify burn severity, aiding in timely intervention. Public awareness – AI-driven chatbots and apps educate users on burn safety measures. Smart home integration – AI-powered sensors detect hazards like gas leaks or overheating appliances.

Conclusion : AI offers transformative potential in burn prevention through predictive analytics, early detection, and public education. Further research and implementation can enhance its effectiveness in reducing burn incidents globally.



AI-Based Early Warning Systems for Burn Incidents: A Systematic Review of Applications in Industrial and Residential Settings

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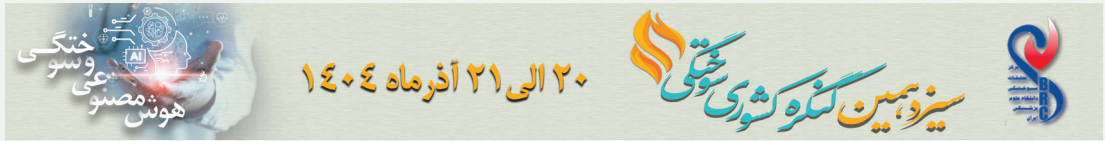
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Purpose : Burn incidents in industrial and residential settings pose significant risks to safety and property. Traditional fire detection systems often suffer from delayed responses and high false alarm rates. Artificial intelligence (AI) has emerged as a promising technology to improve early warning systems by enabling faster and more accurate detection of fire and smoke hazards. This systematic review evaluates AI-driven early warning systems for burn incidents, focusing on their methodologies, effectiveness, and practical applications.

Methods : Following PRISMA guidelines, a systematic search across PubMed, Scopus, and Embase identified 1,245 records. After removing duplicates, 1,000 records were screened, leading to 150 full-text reviews. Forty-five studies met inclusion criteria related to AI-based early warning systems for burn incidents in industrial or residential contexts and were included in the qualitative synthesis. Data extraction emphasized AI techniques, sensor integration, detection performance, and deployment scenarios, with study quality assessed by a standardized checklist.

Results : The studies revealed diverse AI approaches, mainly deep learning models such as convolutional neural networks (CNNs) like YOLO and Faster R-CNN, used for real-time flame and smoke detection via video analysis. Sensor combinations of visual cameras, thermal imaging, and gas sensors improved accuracy and reduced false alarms. Detection accuracies ranged from 85% to 98%, with some systems issuing alerts in under one second. Edge computing was often used to reduce latency and improve reliability. Applications included high-risk industrial zones and smart homes. Challenges involved environmental variability, the need for extensive training data, and balancing sensitivity with false alarms.

Conclusion : AI-based early warning systems enhance burn incident detection by providing improved accuracy, faster responses, and fewer false alarms compared to traditional methods. Integrating deep learning, multi-sensor data, and edge computing enables real-time monitoring and rapid alerts essential for hazard mitigation. Addressing current challenges will optimize performance and support broader adoption, improving fire safety and reducing risks.



Digital Transformation in Burn Management: From Prediction to Follow-up Using Artificial Intelligence and Big Data Analytics

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Purpose : Digital transformation, through the integration of technologies such as Artificial Intelligence (AI), Machine Learning (ML), and Big Data Analytics, has opened new horizons in the management of burn patients. From accurate diagnosis and outcome prediction to personalized care and long-term follow-up, these technologies can enhance care quality, improve clinical decision-making, and increase healthcare system efficiency. This narrative review aims to examine the role of emerging digital technologies—particularly AI and big data analytics—in optimizing burn management from initial assessment through rehabilitation and follow-up

Methods : This targeted narrative review was conducted using a systematic search across international databases, including PubMed, Scopus, Web of Science, IEEE Xplore, and Google Scholar. Keywords used in the search included: artificial intelligence, big data, burns, machine learning, decision support systems, prognosis, and treatment follow-up. The search covered publications from 2013 to 2024. Out of 180 initially identified articles, 42 studies were selected for final review following screening and quality assessment.

Results : The results indicated that AI algorithms such as Random Forest, Support Vector Machines (SVM), and Artificial Neural Networks (ANNs) performed effectively in predicting patient survival, infection risk, scar severity, and length of hospital stay. Big data derived from electronic health records, medical imaging, and wearable sensors contributed to improved diagnostic accuracy and informed care decisions. AI-powered digital platforms were also developed for home-based patient monitoring, wound quality assessment, and personalized care recommendations. However, challenges such as data privacy, technology acceptance among healthcare providers, and user training remain critical issues requiring targeted solutions.

Conclusion : The integration of AI and big data analytics is revolutionizing the multidimensional management of burn patients. These technologies enable more precise, cost-effective, and individualized care. Successful implementation in clinical settings requires the development of ethical frameworks, enhancement of data infrastructure, and comprehensive training for healthcare teams.



The Application of Artificial Intelligence and Big Data in the Critical-Phase Management of Burn Patients: A Narrative Review

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Purpose : In the early hours and days following extensive burns, patients often face life-threatening complications such as hemodynamic instability, fluid-electrolyte imbalances, and metabolic disturbances. Timely and accurate treatment decisions during these critical phases are vital. In recent years, artificial intelligence (AI) and big data analytics have shown potential in supporting clinical decision-making through real-time monitoring, predictive modeling, and personalized care. This narrative review aims to examine current evidence and approaches regarding the use of AI and big data in the acute management of burn injuries.

Methods : A comprehensive literature search was conducted across major databases including PubMed, Scopus, Web of Science, IEEE Xplore, and ScienceDirect, without time restrictions. The search strategy incorporated a combination of keywords based on the MeSH (Medical Subject Headings) vocabulary: “Burns”, “Artificial Intelligence”, “Machine Learning”, “Big Data”, “Critical Care”, “Emergency Medical Services”, and “Clinical Decision Support Systems”. Studies eligible for inclusion were experimental research, case reports, systematic reviews, and technological evaluations that explored AI applications in the emergency and intensive care management of burn patients. Data were synthesized thematically to extract key applications, challenges, and future directions.

Results : Machine learning models have demonstrated value in predicting fluid resuscitation needs, triage prioritization, and early detection of critical complications. AI-driven tools have been used to reduce delays in treatment decisions, optimize intensive care bed allocation, and enhance early warning systems. The integration of historical and real-time patient data has improved personalized treatment pathways in emergency settings.

Conclusion : The integration of artificial intelligence and big data into critical-phase burn care holds significant promise for enhancing clinical accuracy, efficiency, and responsiveness.



Successful implementation, however, requires robust digital infrastructure, ethical frameworks, and targeted training of clinical staff.

A review of the use of intelligent psychological chatbots in anxiety and depression caused by burns

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Purpose : Severe burns can cause significant psychological and social problems, especially anxiety and depression. These problems can slow the patient's recovery process and reduce their quality of life. The present article aims to review the use of intelligent psychological chatbots in anxiety and depression caused by burns.

Methods : This article is a review of scientific articles from PubMed and Google Scholar, selected using the keywords mentioned between 2015 and 2025.

Results : A review of various studies showed that psychological chatbots are able to provide psychological advice and support at any time and place, and provide psychological support to these patients during non-office hours or when they are unable to meet with therapists in person. Patients can express their feelings without feeling ashamed or afraid of being judged. This can help reduce their feelings of isolation and loneliness. Teach patients techniques to reduce anxiety and depression, such as cognitive behavioral therapy (CBT), and relaxation methods such as deep breathing. Chatbots can collect data and assess the mental state of patients and help the treatment team track the status and progress of treatment.

Conclusion : Psychological chatbots can be an effective tool in reducing anxiety and depression in burn patients by providing ongoing psychological support, teaching psychological techniques, reducing feelings of isolation, and improving mental health. However, chatbots cannot replace specialized treatments and human interactions, but should be considered as an auxiliary tool alongside human treatments. Using this technology in the treatment of psychological problems in burn patients can help improve their quality of life and accelerate the recovery process.



Application of artificial intelligence in the rehabilitation of burn patients and identification of related opportunities and challenges

Seyedeh Somayeh Hoseini molkabadi¹ *, Mahboobeh Moafi¹ , Parvin Najafian¹

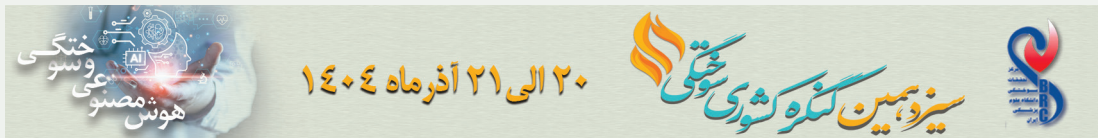
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Purpose : Burns are one of the severe physical and psychological injuries whose treatment and rehabilitation process requires specialized, long-term, and multidisciplinary care. In recent years, significant advances in the field of artificial intelligence (AI) have provided new opportunities to improve the rehabilitation process of patients. The aim of this study is to analyze the applications of artificial intelligence in the rehabilitation process of burn patients and identify the opportunities and challenges associated with it.

Methods : The present study was a review-analytical study and was conducted by systematically reviewing scientific sources. Sources were extracted from PubMed, Scopus, IEEE Xplore and Google Scholar databases. The search in these databases was performed using the keywords: artificial intelligence, rehabilitation, burn patients, challenges. Among the studies published between 2010 and 2024, 30 articles were extracted, and after review, 15 articles were finally reviewed.

Results : The findings show that machine learning-based technologies and recommender systems play an important role in three key phases of rehabilitation: assessing burn severity, predicting treatment progress, and providing personalized rehabilitation programs. Smart rehabilitation tools designed based on artificial intelligence have enabled the delivery of adaptive exercises, remote monitoring, and real-time feedback to patients. However, challenges such as ethical and privacy concerns, the lack of standard frameworks, and resistance from healthcare professionals to emerging technologies pose serious obstacles to the implementation of these achievements.

Conclusion : Artificial intelligence can play a complementary and empowering role in the rehabilitation of burn patients. To realize this potential, the development of data infrastructures, specialized training of treatment teams, and the design of localized and ethically-driven algorithms are essential. Future research should evaluate the operational effectiveness of these technologies in real-world settings and support interdisciplinary collaboration to pave the way for the use of AI in the clinic.



Application of Artificial Intelligence in Burn Diagnosis and Treatment: A Systematic Review

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Purpose : According to the World Health Organization, approximately 300,000 deaths annually are caused by burn injuries worldwide. Misdiagnosis or delayed assessment during initial management can result in severe complications or mortality. Often, the first healthcare professionals evaluating burn patients are not specialized burn clinicians. Artificial intelligence (AI), with advanced data analysis capabilities, has significant potential to improve diagnostic accuracy and treatment outcomes in burn care. This review aims to comprehensively examine the role and efficacy of AI in enhancing burn depth and extent assessment, alongside improving overall treatment quality, based on current research.

Methods : In this systematic review, studies published up to 2025 in English were retrieved from PubMed, Scopus, Google Scholar, and EMBASE. Keywords included “artificial intelligence,” “burn diagnosis,” “machine learning,” “medical image analysis,” and “decision support systems.” Seven relevant articles were selected after screening, with their quality assessed using the Cochrane Risk of Bias tool for validity.

Results : AI algorithms analyzing medical images and clinical data facilitate rapid, accurate assessment of burn depth and classification, aiding surgical planning, treatment guidance, and complication prediction. Studies show AI models can distinguish superficial from deep burns with accuracies between 68.9% and 95.4%, while image segmentation techniques improve precision up to 99.4%. AI also predicts surgical needs by analyzing parameters such as burn surface area relative to body weight and offers evidence-based recommendations for fluid resuscitation and medication dosing. Additionally, AI-driven predictive models estimate risks of complications like infections, shock, and organ failure, enabling proactive management.

Conclusion : AI is increasingly recognized as a powerful tool for improving diagnosis and treatment in burn care. Nonetheless, wider clinical deployment demands larger datasets, standardized methodologies, and extensive validation. Ethical considerations related to data privacy and security are paramount. Continued development of AI models holds promise for substantially improving outcomes, reducing treatment burdens, and advancing personalized burn care.



Application of Artificial Intelligence in Clinical Burn Education: A Narrative Review

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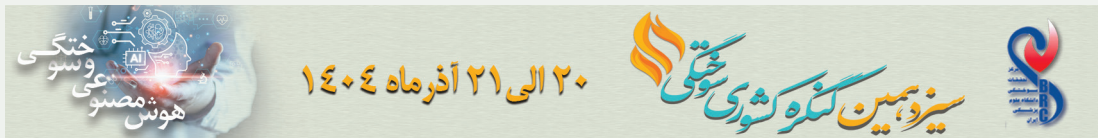
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Purpose : Burns are a global challenge, accounting for approximately 180,000 deaths annually, numerous non-fatal cases annually, resulting in prolonged hospitalization and disability. The inherent potential for error in human assessment of burns has created a pressing need for more advanced training approaches. This challenge has led researchers to increasingly turn to artificial intelligence (AI) and machine learning models to help estimate total body surface area (TBSA) and burn severity. This study aims to evaluate the Application of Artificial Intelligence in Burn Clinical Education.

Methods : This study is a narrative review. A literature search was conducted in PubMed, Web of Science, and Google Scholar for articles published between 2014 and 2024. Keywords included “Artificial Intelligence,” “Burn,” “Machine Learning”. After screening the results, 8 studies most relevant to the topic were selected for comprehensive analysis.

Results : The challenges of burn injuries require technical knowledge and non-technical skills such as communication and leadership. Artificial intelligence technologies, such as augmented reality and adaptive learning platforms, support real-time training. AI provides an effective assessment tool for clinicians unfamiliar with burn systems. AI in burn care improves the accuracy of traditional assessment approaches by helping to calculate TBSA, estimating fluid requirements, assessing surgical needs, and predicting scarring using a variety of data points. Tools such as Chat GPT have demonstrated high accuracy on standardized tests such as ABLIS. These technologies allow students to receive timely guidance in clinical settings using the adaptive learning capabilities of AI.

Conclusion : The integration of AI into burn care education has led to the development of innovative educational systems which these AI tools should complement rather than replace human expertise, requiring appropriate oversight and integration into existing clinical education frameworks. Machine learning improve patient care outcomes by providing objective approaches. Although AI offers significant benefits for clinical burn education, limitations and challenges must be addressed for its effective implementation.



A Mathematical Model for Predicting the change of Direction in Z-plasty with Trigonometric Relativities

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Purpose : Z-Plasty is a common method for repairing contractures due to burns and restricting organ movement. An equation was established using trigonometric relationships that allow the surgeon to accurately estimate the angle size and rotation as a function of the counter holder's length.

Methods : Let us consider a triangle with three sides a, b, and c, and the angles A, B, C, $c^2 = a^2 + b^2 - 2ab \cos C$ $\cos(A) = (b^2 + c^2 - a^2) / 2bc$ the common limb rotation angle (R) can also be calculated using the simple formula: $R = \arccos[(0.5 - \cos C) / (1.25 - \cos C)]$

Results : A mathematical study of the degree of rotation for different angled Z-plasty was performed and tabulated. Angle of z-plasty : Angle of rotation| 30 : 126.2| 35 : 119.1| 40 : 112.5| 45 : 106.3| 50 : 101| 55 : 95.1| 60 : 90| 65 : 85.1| 70 : 80.5| 75 : 76| 80 : 71.7| 85 : 67.5| 90 : 63.5| this study is that there is a clearly defined mathematical relationship between the angle Z and the rotation of the common limbs.

Conclusion : In this paper, we have proposed a new model based on trigonometric relationships to determine the size of the angle and Z-rotation. The primary advantage of the proposed model is that it simplifies the management of increased length of contraction, ensuring that equations always provide a unique solution. The concept behind this new model holds potential for future use. We used MATLAB to implement this model.



Factors affecting the survival of burn patients with an artificial intelligence approach

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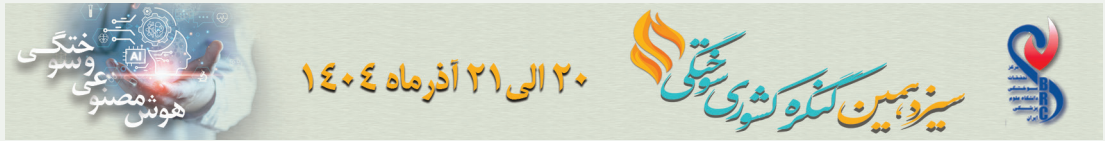
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Purpose : Burns are one of the most common injuries worldwide. The challenges related to the survival rate of burn patients as well as the mortality rate due to it have led to progress in identifying risk factors. Early diagnosis and recognition of risk factors are essential and providing predictive models can be useful. This study aimed to review the performance of artificial intelligence in predicting survival in burn patients.

Methods : The present study aimed to review the performance of artificial intelligence in predicting survival in burn patients. The search for sources for this review article was conducted in PubMed, Scopus, Web of Science ISI, and Google Scholar databases. The search in these databases was conducted using the keywords: artificial intelligence, survival rate, and burn. Among the studies published between 2010 and 2024, 30 articles were extracted, and after review, 15 articles were finally reviewed.

Results : Survival analysis is an advanced statistical method used to predict the time of occurrence of a specific event (such as death, disease recurrence, or treatment success). Combining survival analysis with artificial intelligence allows for the identification of complex relationships between medical data and provides more accurate and reliable predictions. Combining this method with artificial intelligence allows for the creation of more accurate and reliable models. The use of data mining methods on large volumes of data with the aim of producing predictive models and patterns has become widespread in many medical fields.

Conclusion : Artificial intelligence optimizes survival analysis using machine learning and deep learning and has the ability to work with large and complex data. . The use of machine learning algorithms in predicting the survival of burn patients and determining the influencing factors is promising and useful.



Harnessing Stromal Vascular Fraction in the Management of Post-Burn Musculoskeletal Dysfunction

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Purpose : Severe burn injuries cause debilitating musculoskeletal complications like joint contractures, sarcopenia, and Heterotopic Ossification (HO). Current treatments, including physical therapy and surgery, have limited efficacy, significant complications, and high recurrence rates, creating an unmet clinical need. This review examines the pathophysiology of post-burn complications and elucidates the scientific rationale for using adipose-derived Stromal Vascular Fraction (SVF) as a novel therapy to improve outcomes for burn survivors.

Methods : This review analyzes existing literature on the pathophysiology of post-burn musculoskeletal dysfunction, the cellular composition and mechanisms of action of SVF, and its potential in tissue regeneration. Key challenges to clinical translation, including the lack of standardization, donor variability, and regulatory hurdles, are also systematically reviewed.

Results : SVF is a heterogeneous cell population from adipose tissue containing Adipose-Derived Stem Cells (ASCs), Endothelial Progenitor Cells (EPCs), pericytes, and M2 macrophages that function as a synergistic therapeutic ecosystem. Its therapeutic potential stems from multiple mechanisms, including: • Potent immunomodulatory and anti-inflammatory effects. • Anti-fibrotic activity to mitigate scarring. • Enhanced angiogenesis to restore tissue perfusion. • Direct regenerative capacity via multilineage stem cell differentiation. However, its widespread clinical use is limited by a lack of standardization, donor-dependent variability, and regulatory hurdles.

Conclusion : SVF offers transformative potential by targeting the underlying pathophysiology of post-burn musculoskeletal complications. Realizing this potential requires establishing standardized protocols, developing reliable potency assays, and conducting large-scale randomized controlled trials (RCTs) to confirm long-term safety and efficacy. Addressing these challenges is critical to improving the quality of life and functional independence for



burn survivors.

the Effect of Mesenchymal Stem Cell Therapy on The Treatment of Burn Wounds: A Review Article

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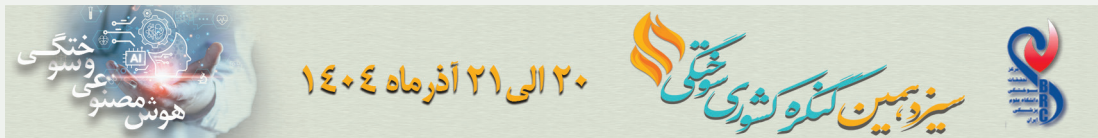
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Purpose : Burn injuries pose significant clinical challenges due to high morbidity and delayed healing. Mesenchymal stem cells (MSCs), derived from bone marrow, adipose tissue, or other sources, offer promise in burn management. Their regenerative potential arises from paracrine signaling, secretion of growth factors, anti-inflammatory cytokines and exosomes that modulate tissue repair, angiogenesis, and scar formation.

Methods : This review was conducted by searching for articles published from 2019 to 2024 in online databases such as Google Scholar, PubMed and Scopus. Keywords used for search were (“Cell Therapy” OR “Stem Cell Therapy”) AND (“Burn Treatment” OR “Burn Wound Healing”).

Results : In a clinical trial of 10 patients with deep second-degree burns, allogeneic bone marrow-derived Mesenchymal Stem Cells (BM-MSCs) accelerated wound closure with 100% healing and no rejection with the improvement in scar quality. Another clinical trial stated that MSC therapy significantly enhanced wound closure rate, increased vascular density and reduced eschar. thickness. No major adverse events were reported. A case report suggested that MSC injection completely healed a large unhealing burn wound on a patient with 18 months of conventional treatment failure, with no keloids formation during a 6-year follow-up period.

Conclusion : MSC therapy demonstrates significant potential in enhancing burn wound healing and minimizing scarring. Although clinical evidence is limited by small cohorts and protocol heterogeneity, current findings suggest that future studies with standardized delivery methods, larger controlled trials, and exploration of combined approaches could bring a new gold standard to optimize regenerative outcomes.



Limbal stem Cell Therapy for Ocular Burns;Advances,Challenges,and Clinical Implications:A Comprehensive Review

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Purpose : Abstract Chemical and thermal injuries to the ocular surface are among the most severe causes of limbal stem cell deficiency (LSCD), leading to impaired corneal healing and vision loss. Among regenerative strategies, cell-based therapies—particularly limbal stem cell transplantation—have shown strong potential in restoring ocular surface integrity and function.

Methods : Objective To review current therapeutic approaches using limbal stem cells in the management of corneal burns, with emphasis on clinical outcomes and future prospects. Methods A literature search was conducted using PubMed, ScienceDirect, SpringerLink, and Ovid databases for relevant clinical studies published between 2015 and 2024. A total of 15 studies were included, focusing on Simple Limbal Epithelial Transplantation (SLET), Cultivated Limbal Epithelial Transplantation (CLET), and Cultivated Autologous Limbal Epithelial Cells (CALEC). Data were assessed based on epithelial healing, visual improvement, and safety profiles.

Results : Results Limbal stem cell transplantation shows consistent efficacy in ocular surface reconstruction. SLET offers a cost-effective and straightforward option with minimal infrastructure needs, while CLET and CALEC provide personalized, lab-intensive therapies with high success rates. Autologous techniques reduce the risk of immune rejection. Major challenges include limited access to cell culture facilities and the need for long-term follow-up data. These therapies are especially valuable in managing severe corneal burns that are unresponsive to conventional treatment.

Conclusion : Conclusion Limbal stem cell therapy represents a promising and evolving strategy for treating LSCD following ocular burns. Advances in cell culture, gene editing, and biomaterials are likely to enhance outcomes and accessibility. Incorporating these therapies into national care frameworks, particularly in developing countries such as Iran, may significantly improve patient prognosis.



Standardized Checklists for Primary Prehospital Emergency Care in Severe Burn Injuries: A Systematic Review of Design and Validation Studies

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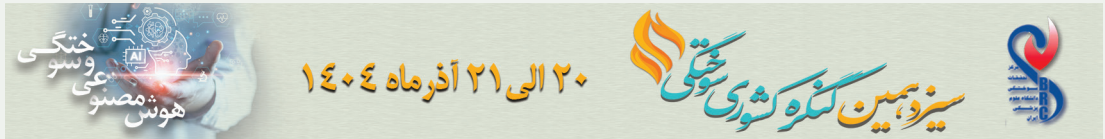
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Purpose : Severe burn injuries require immediate, systematic, and high-quality prehospital care to prevent early complications and improve outcomes. Standardized checklists have been proposed to enhance the consistency and accuracy of emergency interventions. However, the design quality, validation status, and clinical utility of such checklists remain unclear. This systematic review aimed to assess the literature on the development and validation of standardized checklists for primary prehospital care in patients with severe burns.

Methods : Following PRISMA 2020 guidelines, a comprehensive search was conducted in PubMed, Scopus, Web of Science, Embase, and CINAHL for studies published from January 2000 to February 2025. Search terms included combinations of “burn injury,” “severe burn,” “prehospital treatment,” “checklist,” “emergency medical services,” “validation,” and “tool development.” Inclusion criteria were original studies describing the creation, validation, or implementation of checklists for prehospital burn management. Reviews, case reports, simulation tools without validation, and in-hospital-only checklists were excluded. Methodological quality and risk of bias were assessed using the COSMIN checklist and Joanna Briggs Institute tools. A narrative synthesis was applied.

Results : 12 studies from 9 countries met the inclusion criteria, involving 1,435 EMS professionals and burn specialists. Seven studies detailed the development of new checklists using literature reviews, Delphi methods, or expert panels. Only five studies conducted psychometric validation (e.g., content validity, inter-rater reliability), with varying methodological rigor. Validated checklists generally addressed airway management, burn area estimation, initiation of fluid resuscitation, pain control, and decisions regarding rapid transfer. Reported inter-rater reliability ranged from moderate to excellent (ICC 0.65–0.91). Few studies examined real-world implementation or integration into EMS protocols.

Conclusion : Despite the recognized need for standardized burn care, there is limited evidence on the structured development and validation of prehospital burn checklists. Existing tools vary in design and validation rigor. Future research should prioritize multi-center validation, real-world usability testing, and evaluation of the impact on clinical outcomes and EMS decision-making accuracy.



Investigation of the causes of limb amputations and their relationship with the type of burn in Shahid Motahari Educational and Medical Center, Tehran, in 2023-2024

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Purpose : Objective: Severe burns, particularly those of electrical and thermal origin, can lead to irreversible tissue damage that may ultimately necessitate limb amputation. This condition can result in diminished quality of life, functional disability, and impose significant psychological and economic burdens on affected patients. The objective of this study is to investigate the causes of limb amputation and its relationship with the type of burn in patients admitted to Shahid Motahari Educational-Therapeutic Center in Tehran during the years 2023–2024.

Methods : Methods: This is a descriptive, cross-sectional, retrospective study. The study population includes all adult patients with a history of burn injury and limb amputation who were hospitalized at the mentioned center during the specified time period. Sampling will be conducted using a convenience method, and data will be extracted from patients' medical records and recorded in a structured data collection form. Collected variables include age, gender, type and degree of burn, affected limb, underlying diseases, and the level of amputation.

Results : Findings: It is anticipated that a significant proportion of limb amputation cases among burn patients will be associated with deep electrical and thermal burns. It is also expected that the prevalence of amputation will be higher in males, particularly in the upper limbs, and that there will be a significant correlation between burn severity and the occurrence of amputation. Factors such as delayed treatment, infection, and underlying medical conditions may play a key role in increasing the risk of amputation. These findings may underscore the importance of preventive measures and early therapeutic interventions.

Conclusion : Conclusion: Identifying the factors contributing to the occurrence of limb amputation can aid in prevention, facilitate more rapid clinical decision-making, reduce complications, and improve the quality of care for burn patients.



Investigating the Relationship Between Gender and Burn Outcomes in Adult Patients Admitted to a Burn Center in Northern Iran

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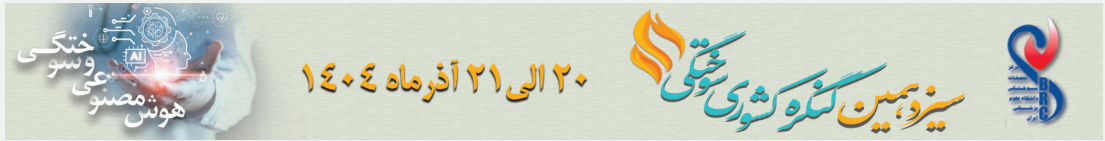
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Purpose : Despite significant progress in burn management, burns remain a major cause of morbidity and mortality worldwide. While various factors influence burn outcomes, the specific role of gender remains debated. This study aimed to investigate gender-related differences in burn exposure, characteristics, and clinical outcomes among adult patients admitted to a regional burn center.

Methods : A retrospective study was conducted at a specialized burn treatment and training center in Rasht, Iran, covering all admissions due to burns from September 2014 to September 2019. Adult patients aged 18–55 years with second- or third-degree burns involving 20% to 60% of total body surface area (TBSA) were included. Patients with severe underlying conditions (ASA class > III) or morbid obesity (BMI > 35 kg/m²) were excluded. Data were extracted from hospital records via the Health Information System (HIS) and entered into a structured checklist developed by the researchers.

Results : The leading cause of burns among women was contact with hot liquids and food, largely associated with domestic cooking activities. These burns were often more extensive but shallower compared to those in men. A higher mortality rate among women was observed, potentially linked to immunological differences. Additionally, self-immolation was notably more prevalent among single women, highlighting the need for targeted psychological support. Preventive education focused on household safety and mental health interventions could play a key role in reducing the incidence and severity of burns in this population.

Conclusion : Gender significantly influences burn patterns and outcomes. Incorporating gender-specific risk factors into prevention strategies and clinical management may improve prognosis and reduce burn-related mortality.



Study of demographic, clinical and outcome characteristics of burn patients referred to Choromi Burn Hospital, Genaveh, Bushehr

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4. Nursing student at Shiraz University of Medical Sciences

Purpose : Background: Burn injuries constitute a significant public health concern worldwide, accounting for over 180,000 deaths annually. These injuries can result in physical disabilities, disfigurement, and psychological complications. The present study aimed to investigate the demographic and clinical characteristics, as well as the outcomes, of burn patients referred to the Cheromi Burn Trauma Hospital in Genaveh, Bushehr

Methods : Methods: This retrospective study was conducted based on a review of the patient records from the Emergency Department of Choromi Burn Hospital between 2011 and 2021. Demographic characteristics (age, gender, marital status), cause of burns, location and setting of the incident, severity and percentage of burns, and the time elapsed before hospital referral were collected and analyzed using SPSS version 26.

Results : Results: The findings showed that males (63.7%) were more frequently affected by burns than females (36.3%). Most burn incidents occurred in residential settings (75.8%) and urban areas (79.1%). In terms of the most common locations where the patients suffered from burns, included 3,108 people (46%) in Genaveh and Deilam, and 1,346 people (19.9%) in Dashtestan. Out of the patients, 4,465 people (75.8%) had burns at home, 516 people (8.8%) in the streets, 465 people (7.9%) in the workplace, 170 people (2.9%) in sports venues, 119 people (2%) on roads and highways, and 21 people (0.4%) in schools and educational facilities. The leading cause of burns was scald burn (52.5%), followed by flame burn (29.1%).

Conclusion : Conclusion: About three-quarters of burn accidents occur at home and the study highlights that delays in hospital referral can adversely impact the clinical outcomes of burn injuries. These findings can contribute to the development of improved therapeutic strategies and preventive programs for burn management.



The Impact of a Workshop-Based Burn Wound Care Education Program for Children Utilizing the Kirkpatrick Model on Nurses' Knowledge and Performance: A Randomized Clinical Trial

Fateme Mohammadian¹ *

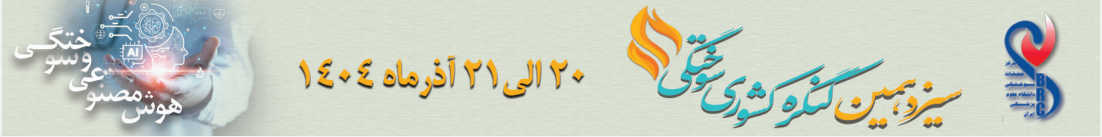
1. department of burn hospital, rasht

Purpose : Purpose: Burn injuries in children are a significant public health concern, requiring specialized and evidence-based wound care to reduce complications and enhance recovery. As frontline healthcare providers, nurses need advanced knowledge and skills to deliver effective burn care; however, gaps in training often impede optimal outcomes. This study examines the effectiveness of a structured workshop-based educational intervention on pediatric burn wound care, using the Kirkpatrick model to assess its impact on nurses' knowledge and performance.

Methods : Methods: This educational trial involved 60 pediatric nurses. Participants were selected through census sampling and were randomly assigned to either the control or intervention group. The control group received online webinar-based training, while the intervention group participated in a workshop-based educational program developed according to the Kirkpatrick evaluation model for wound care. Data collection tools included demographic information, a researcher-designed questionnaire assessing nurses' knowledge and performance in pediatric wound care, and a nurse satisfaction checklist. Data were analyzed using SPSS version 26.

Results : Results: the workshop-based educational intervention demonstrated a statistically significant improvement in nurses' knowledge (10.9 ± 1.9), performance (39.6 ± 1.9), and Satisfaction levels ($P < 0.05$). Nurses' knowledge was significantly influenced by their work experience and prior participation in training programs. Furthermore, multivariate analysis identified several predictors of post-intervention performance scores, including a lack of involvement in pediatric burn wound care training programs ($P = 0.046$, $B = -1.39$), work experience ($P = 0.024$, $B = +0.139$), and employment type ($P = 0.05$, $B = +1.5$).

Conclusion : Conclusion: Findings emphasize the effectiveness of workshop-based training in improving nurses' competencies and highlight the importance of targeted educational interventions to enhance clinical outcomes in pediatric wound care. The interactive and adaptive nature of workshop learning, combined with e-learning's flexibility and lack of time and place restrictions, suggests that both can be used as complementary methods in modern training.



Factors Influencing Hospitalization Duration and Mortality in Burn Patients: A 2-Year Analysis of Causes, Age, and Total Body Surface Area

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Purpose : Burn injuries are a significant global issue, they can result from various sources. Research shows that patients with severe burns typically require longer hospital stays, which lead to higher medical costs. Given these complexities, this study aims to examine the relationship between hospital length of stay and causes of the burn, patient age, and TBSA, among individuals admitted to Amir al-Momenin Burn Hospital in Shiraz from January 27, 2021, to July 23, 2023.

Methods : The current research was a descriptive and analytical investigation conducted using data from the Burn Data Registry. population comprises all burn patients who were admitted to the hospital. We categorized the patients into six groups according to the underlying cause of their burns, and then measured length of stay, patients' age, and TBSA and compared them with each other.

Results : We found that Explosion and fire were the main causes for burns hospitalization. The leading cause of death was fire and explosion was the second important cause of death. Hot solids with 9.1 days and electricity with 19.91 days are considered as the shortest and longest length of stay in hospital. Burns with fire and explosion had the highest TBSA with 36.59% and 35.74%. We discovered that burns with hot liquids and vapor occurred at an average age of 19.73 years.

Conclusion : The findings indicated that burns from explosions and flames are the primary causes of injury, highlighting the need for prevention strategies. Patients with electrical burns experienced longer hospital stays due to specific complications. The severity of burn injuries is closely related to hospitalization duration. Those burned by hot liquids and vapor tend to be younger than those injured by other causes. This risk can be reduced by establishing a designated play area for children away from the kitchen.



Burns Due to Traditional Medicine Interventions: The Deadly Chain of Blistering, Infection, and Sepsis in a Diabetic Patient from Underserved Areas

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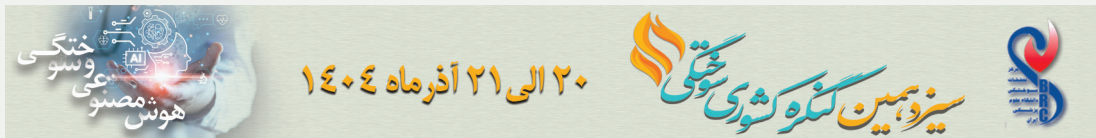
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Purpose : The use of traditional medicine and alternative treatment methods in rural communities, especially in areas with limited access to modern medical services, is a common phenomenon. Although these methods may provide temporary relief in some cases, their misalignment with scientific principles and delays in seeking medical care can lead to irreparable complications. Burn injuries result in significant physiological and pathological changes that can cause severe complications such as infection, disability, and death. The aim of this study is to present a case report of a patient who died due to burns caused by traditional medicine treatment.

Methods : case report

Results : A 74-year-old illiterate Turkmen woman living in a village in Gonbad, with a history of diabetes and hypertension, experienced swelling and stiffness in her left hand. Due to the lack of access to medical facilities, her family consulted a “local healer” who treated her with hot water, salt washing, and opium smoke. This treatment resulted in blistering, infection, and deterioration of the patient’s condition. Subsequently, the patient was hospitalized. Despite receiving modern care during hospitalization, she ultimately succumbed to septicemia and worsening health

Conclusion : This report illustrates that burns resulting from unscientific treatments in rural areas and delays in referral to medical facilities can lead to severe infections, septicemia, and patient death. Health education, raising awareness among families, and improving access to primary and specialized healthcare services for high-risk patients (such as diabetics) are essential. Providing practical solutions that include integrating traditional medicine with modern medicine to reduce cultural resistance may be beneficial.



Effect of silk protein spray in emergency management of acute burn wounds: A review study

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Purpose : Proper wound care is a key indicator of the quality of nursing services, as it is crucial for preventing infection, alleviating pain, and minimizing scarring. Sprayable wound care products are recognized for their ease of use and effectiveness in creating a hygienic and protective barrier, particularly in emergency situations and for irregularly shaped wounds. Therefore, this study aimed to evaluate the effectiveness of a spray containing silk protein in managing acute burn wounds.

Methods : This study utilized a review method by searching databases such as PubMed, Embase, Scopus, Science Direct, Irandoc, SID, and Magiran. Articles were selected using the keywords “burn injury,” “immune response,” “inflammation,” “tissue regeneration,” and their English equivalents. The review focused on publications from 2015 to 2025.

Results : This review included 14 studies, which were analyzed based on several factors. The studies were categorized by the type of dressing used (silk protein spray and silk protein dressings), the characteristics of the wounds (including wound type, location, and stage), and the age of the patients (children or adults). Each category was analyzed separately to draw clearer conclusions.

Conclusion : Research has shown that a coating made from silk protein spray, especially when paired with antibiotics, can significantly improve the healing process of deep partial thickness burns compared to standard treatments. This method is particularly advantageous in emergency wound care because of its quick effects. However, the studies conducted on this topic have been limited to a small number of countries and patients, which underscores the need for further research.



A Narrative Review on the Effect of Virtual Reality on Pain Management in Pediatric Burn Patients

Zahra Yousefi¹ *, Shadi Ghataran¹

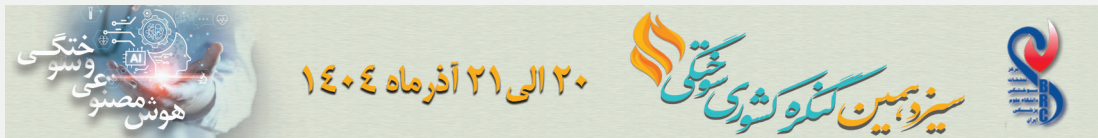
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Purpose : Introduction: Pain management during burn care in children remains a clinical challenge, especially during dressing changes, due to the limitations and side effects of pharmacologic analgesics. In recent years, virtual reality (VR) has emerged as a promising non-pharmacological, interactive tool for procedural pain relief. VR engages multiple senses and distracts patients from pain, offering an immersive experience that can improve both physical and psychological outcomes in pediatric burn patients.

Methods : Methods: This narrative review included a comprehensive search of English-language articles published between 2015 and 2025 in PubMed, Scopus, Web of Science, and Google Scholar. Keywords used were “Virtual Reality,” “Pain,” and “Burns.” After screening titles, abstracts, and full texts, twelve relevant studies were selected based on inclusion criteria. These included systematic reviews, meta-analyses, and randomized controlled trials focusing on pediatric burn patients undergoing painful procedures.

Results : Results: Findings from the selected studies indicate that various VR modalities—including immersive, desktop-based, projector-based, and smartphone-based systems—effectively reduce pain, anxiety, and fear in children during burn care. Two recent studies also explored the acceptability and usability of VR systems like Smileyscope, reporting high satisfaction among patients, caregivers, and clinicians. VR was shown to be particularly effective during dressing changes, even in cases of extensive burns. Meta-analyses further support its efficacy across multiple trials.

Conclusion : Conclusion: Virtual reality is recognized as a safe, effective, and well-accepted adjunct in pediatric burn pain management. Larger, high-quality studies are recommended to refine VR technologies and integrate them into standardized treatment protocols aimed at improving patient outcomes.



Impact of Acute In-Hospital Post-Burn Pruritus on Quality of Life: A Cross-Sectional Study

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Purpose : Background: Post-burn itching is a common and distressing complication after thermal injury that can severely diminish patients' well-being. Despite its prevalence, the acute effects of itch during hospitalization and how it relates to specific burn characteristics remain insufficiently explored, particularly in non-Western populations.

Methods : Methods: We conducted a cross-sectional study in 2021 at Velayat Hospital in Rasht, Iran, enrolling 268 adults who had been admitted for at least 48 hours following a burn injury. Through patient interviews and medical-record review, we gathered information on demographics; burn severity—measured by the percentage of total body surface area affected, depth of tissue damage, and anatomical location of burns; and itch parameters—measured by patient-rated intensity on a 0–10 scale, duration in days, and areas of the body affected. To assess long-term well-being, we used the ItchyQoL questionnaire, which quantifies the impact of itching on physical, emotional, and functional aspects of quality of life. We applied parametric, non-parametric comparisons and multivariable regression models to examine how itch characteristics and burn severity influenced immediate recovery and subsequent quality of life

Results : Results: Patients who experienced itching had larger areas of skin damage, deeper tissue injuries, and longer hospital stays than those without itching. Higher itch intensity and longer itch duration both correlated with poorer scores on the ItchyQoL, indicating a greater negative impact on quality of life. In multivariable analysis, itch intensity emerged as the strongest predictor of reduced well-being, followed by duration of itching, depth of the burn injury, and percentage of body surface area burned. Moreover, the anatomical site of the burn influenced both the severity of itching and the length of hospitalization.

Conclusion : Conclusions: The intensity and persistence of itching during the acute hospitalization period play a critical role in patients' recovery trajectories and their long-term quality of life after a burn injury



Management of Hypothermia in Burn Patients in the Operating Room

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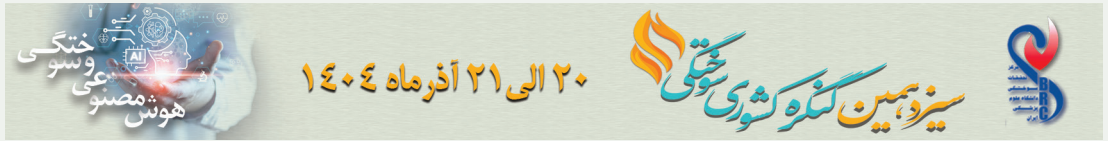
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Purpose : Hypothermia occurrence in the operating room has been identified as a potential risk for patients. Patients under general anesthesia typically experience a temperature decrease of about 4°F (2.2°C) without warming interventions. Burn patients, due to their larger body surface area, skin epidermal barrier destruction, and longer surgical procedures, are at greater risk of hypothermia. This study aims to discuss management strategies for hypothermia in burn patients in the operating room.

Methods : This study was conducted as a literature review using various information databases such as Medline, Google Scholar, and PubMed. Different keywords including “operating room,” “burn management,” and “burns” in both Persian and English were used for the search. Out of 38 articles found, 19 articles related to the research topic were selected.

Results : Hypothermia in burn patients can result from various factors such as removing clothing and burn dressings during patient preparation, irrigating burn wounds with antiseptics, leaving the donor site open for autograft, low operating room temperature, administering cold intravenous fluids, inhalation of gases, contact with cold surfaces, and disturbances in thermoregulation during anesthesia induction. Previous studies have shown that patients with higher surface area burns (greater percentage of burns) or full-thickness burns are more prone to temperature drops.

Conclusion : The findings indicate that burn patients in the operating room are at significant risk of hypothermia. To address this issue, it is essential to develop protocols for preventing hypothermia in the operating room. Additionally, preventive measures such as active and passive warming before surgery, warming of fluids, maintaining the operating room at an optimal temperature, using thermal intervention devices, and having a dedicated burn surgery nurse in the operating room can improve safety and help prevent hypothermia. Training operating room nurses about the latest innovations in burn surgery and methods to prevent hypothermia in the operating room can also be beneficial.



Integrated Approaches to Pain and Pruritus Management in Burn Patients: A Comprehensive Review of Pharmacological and Non-Pharmacological Interventions

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Purpose : Burn injuries often lead to intense pain and pruritus (itching), significantly affecting patients' quality of life and hindering their recovery and rehabilitation. Addressing these symptoms remains a complex aspect of burn care, necessitating a comprehensive approach that considers both physical and psychological factors. This review aims to provide an overview of the existing evidence on both pharmacological and non-pharmacological methods used to manage pain and itching in individuals with burn injuries.

Methods : An extensive search was performed across PubMed, Scopus, and Web of Science databases, covering publications from 2014 to 2024. Eligible studies included randomized controlled trials (RCTs), systematic reviews, meta-analyses, and observational studies. The search utilized terms such as “burn pain,” “burn pruritus,” “itching,” “analgesia,” “antipruritic,” “non-pharmacological therapy,” and “multimodal management.” Data were systematically extracted and thematically analyzed to identify commonly employed treatment strategies and their effectiveness.

Results : The findings highlighted that multimodal strategies combining opioids, non-opioid analgesics (e.g., acetaminophen, NSAIDs), gabapentinoids, and regional anesthesia play a crucial role in managing both acute and chronic burn pain. For itch control, commonly used interventions included antihistamines, gabapentinoids, selective serotonin reuptake inhibitors, and topical treatments like menthol and capsaicin. Additionally, non-pharmacological approaches, including massage therapy, cognitive-behavioral therapy (CBT), transcutaneous electrical nerve stimulation (TENS), and virtual reality (VR) distraction, were found to offer supportive benefits in managing pain and itching. The evidence supports the need for personalized, patient-centered care plans to enhance symptom control.

Conclusion : Managing pain and pruritus in burn patients demands a holistic, interdisciplinary, and multimodal approach that integrates both medical and non-medical interventions. Future studies should prioritize the creation of standardized treatment guidelines, the exploration of new therapeutic options, and the assessment of long-term outcomes associated with comprehensive management plans.



Evaluation the relationship between itching and pain caused by burns on the mental health of burn patients in a burn care hospital

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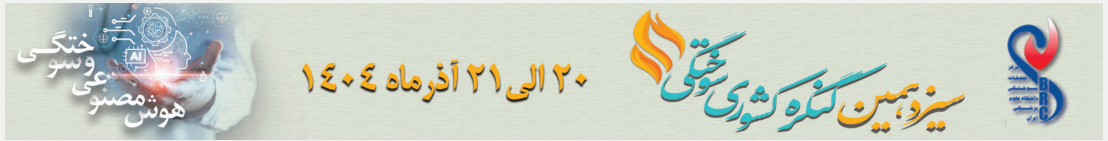
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Purpose : Burn injuries often lead to a range of physical, psychological, and social consequences beyond the visible wounds, including itching and pain, which can significantly impact patients' mental health. This study investigated the relationship between itching, pain, and mental health in burn patients treated at Valiasr Hospital in Rasht.

Methods : A total of 78 patients (45 males and 33 females) with varying degrees of burns, predominantly second- and third-degree (35.9%), were enrolled. The study employed the Numeric Rating Scale (NRS) to assess pain, the Yosipovitch Itch Questionnaire to measure itch intensity, and the General Health Questionnaire (GHQ) to evaluate mental health. Data were collected at one, three, and six months post-burn during follow-up visits. Standard burn treatments were administered under the supervision of pain specialists and plastic surgeons.

Results : Results revealed a significant improvement in mental health scores over time, with notable differences observed between all measured intervals (1 vs. 3 months, 3 vs. 6 months, and 1 vs. 6 months). Similarly, itch intensity showed a significant decrease across these time points. Pain intensity did not differ significantly based on gender or burn severity. Importantly, an inverse relationship was found between the intensity of itching, pain, burn percentage, and mental health scores at all three time points, indicating that higher physical symptom severity corresponded to poorer mental health.

Conclusion : The study highlights that as time progresses after a burn injury, patients experience reductions in itching and pain alongside improvements in mental health. These findings emphasize the importance of addressing both physical symptoms and psychological well-being in burn care to enhance overall recovery outcomes.



A Narrative Review of Nursing Interventions for Pain Management in Burn Patients

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Purpose : Burn pain is among the most severe and persistent types of pain. In addition to the injury itself, routine treatments such as wound care and surgical procedures often worsen the pain, negatively affecting patients' physical, psychological, and social well-being. This leads to a decline in quality of life. Nurses, as the largest group in burn care teams, play a vital role in providing continuous and comprehensive care. However, choosing and implementing effective pain management strategies remains a global challenge. This review aims to examine the role and effectiveness of nursing interventions in managing pain in burn patients.

Methods : A comprehensive search was conducted across multiple databases, including PubMed, Google Scholar, and the Cochrane Library. Articles published between 2010 and 2025 were retrieved using the keywords “ Burns,” “ Pain Management,” “Pain,” “wound healing,” and “Nursing Care.” After reviewing the titles and abstracts, twenty articles focusing on the nursing interventions for pain management in burn patients were selected and subjected to content analysis.

Results : Although the reviewed studies employed various non-pharmacological nursing interventions to manage pain in burn patients, the most commonly reported strategies included regular breathing techniques, biological/synthetic/traditional dressings, jaw and muscle relaxation, music therapy, play therapy, massage therapy, aromatherapy, guided imagery, spiritual practices, and virtual reality. Several studies demonstrated that these interventions contributed to significant reductions in pain intensity, improved patient comfort, and enhanced psychological coping during wound care procedures.

Conclusion : Given the harmful effects of pain on the health of burn patients, the potential side effects of pharmacological treatments, and the significant role of nurses in alleviating pain, it is recommended that nurses incorporate complementary and non-pharmacological interventions into routine nursing care for burn patients. These approaches can serve as effective adjuncts in managing burn-induced pain.



Novel Approaches in the Management of Pain and Pruritus in Burn Patients: Enhancing Quality of Life and Improving the Treatment Process

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Purpose : Pain and pruritus are common and distressing complications in burn patients, negatively affecting quality of life and rehabilitation. This systematic review aimed to explore evidence-based pharmacological and non-pharmacological interventions and their impact on symptom control and patient outcomes.

Methods : This systematic review was conducted according to the PRISMA 2020 guidelines. A comprehensive and structured search was performed in the following scientific databases: PubMed, Scopus, Web of Science, Cochrane Library, and Google Scholar. A combination of Persian and English keywords was used, including: “burn pain,” “pruritus in burn patients,” “pain management,” “itch treatment,” “quality of life,” “rehabilitation,” “non-pharmacological interventions,” and “novel therapies.” The search covered articles published from 2010 to 2024. After initial screening, removal of duplicates, and abstract review, studies meeting the following criteria were included in the final analysis: experimental studies (randomized clinical trials, quasi-experimental, and interventional designs), focus on moderate to severe burn patients, and acceptable methodological quality assessed by standard tools such as CONSORT and CASP. In total, 31 high-quality and relevant articles were included in the final analysis.

Results : The results revealed that novel non-pharmacological interventions such as photo biomodulation therapy, acupuncture, cognitive-behavioral therapy, and transcutaneous electrical nerve stimulation (TENS) significantly reduced pain and pruritus and improved sleep quality. New pharmacological treatments, including gabapentin, pregabalin, duloxetine, and naloxone, were effective in managing neuropathic pain and resistant pruritus. Combined approaches (pharmacological + non-pharmacological) showed the greatest effectiveness in enhancing patient participation, improving quality of life, and reducing the use of opioid medications. Nurse education and the design of multidisciplinary interventions played a critical role in treatment success.

Conclusion : Integrative and innovative strategies significantly improve symptom control, enhance quality of life, and support faster rehabilitation in burn patients. Implementing these methods in clinical care protocols is highly recommended

(PTSD) symptoms in patients with burns caused by fires in Ali Ibn Abi Taleb (AS) Hospital in Zahedan

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Purpose : Burns are among the most severe physical injuries that can lead to widespread psychological consequences. One of the most common psychological reactions after burns is post-traumatic stress disorder (PTSD), which is accompanied by symptoms such as reexperiencing the event, avoidance, increased arousal, and mood and cognitive impairment in the first weeks after the accident. Early diagnosis and intervention in this disorder can prevent it from developing into post-traumatic stress disorder (PTSD). The aim of this study was to investigate the prevalence of acute post-traumatic stress in patients with fire burns, and to compare it between men and women

Methods : This descriptive-cross-sectional study was conducted on 82 patients with burns caused by fire who were hospitalized at Ali Ibn Abi Taleb (AS) Hospital in Zahedan between 1399 and 1403. Of these, 51 were male and 31 were female. The diagnosis of symptoms of post-traumatic stress disorder (PTSD) was made using a clinical assessment based on DSM-5 criteria and by a clinical psychologist. The data were analyzed using descriptive statistics

Results : Of the 51 men, 34 (66.7%) and of the 31 women, 21 (67.7%) showed symptoms of posttraumatic stress disorder. Overall, 55 of the 82 patients (67%) met criteria for posttraumatic stress disorder. There was no significant difference in the prevalence of this disorder between the two sexes

Conclusion : The results of the present study show that the prevalence of acute post-traumatic stress disorder in burn patients is very high, and there is no significant difference between men and women in this regard. This finding highlights the importance of immediate attention to the psychological state of burn patients and early psychological interventions. Psychological screening is recommended in the early days of hospitalization to prevent the persistence of symptoms and their chronicity



Effects of an Occupation-Based Intervention on Hand and Upper Extremity Function, Daily Activities, and Quality of Life in People With Burn Injuries: A Randomized Controlled Trial

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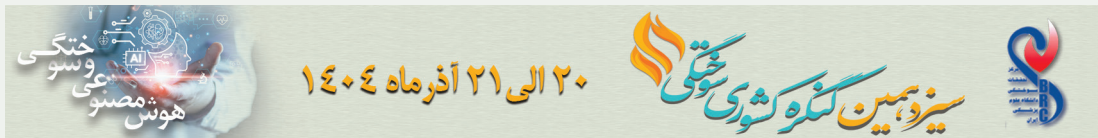
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Purpose : Background: Occupational performance and function are affected in people with burn injuries to the hand and upper extremity; this can lead to the development of some disabilities and endanger quality of life. Objective: To investigate the effects of occupation-based intervention on hand and upper extremity function, daily activities, and quality of life in people with burn injuries.

Methods : Interventions: The control group received only traditional rehabilitation, and the intervention group received traditional rehabilitation and took part in the Cognitive Orientation to daily Occupational Performance (CO-OP) protocol (18 sessions, 45 min/day, for both groups). Measures: Assessments included the CO-OP; Michigan Hand Outcomes Questionnaire; Shortened Disabilities of the Arm, Shoulder and Hand Questionnaire; Modified Barthel Index; World Health Organization Quality-of-Life Scale–Brief; a visual analogue scale; measurements with a goniometer and dynamometer; and the figure-of-eight method. These evaluations were conducted with both groups before the rehabilitation program commenced and at Wk 2, 6, and 14 (follow-up).

Results : Results: The results showed that there were notable changes in all the study variables except edema in both groups. However, these changes ($p [V] ? .05$) were not statistically significant between the two groups.

Conclusion : Conclusions and Relevance: According to the results, the occupation-based interventions are as effective as traditional therapeutic interventions for the improvement of hand and upper extremity function, ability to perform daily activities, and quality of life in people with burn injuries.



The Impact of Sleep Disorders on the Recovery of Burn Patients and the Role of Nursing Care in Their Management

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Purpose : Sleep disorders are one of the common problems among burn patients, which can negatively affect both physical and psychological recovery. Targeted nursing care focusing on sleep hygiene, pain management, and psychological support may improve sleep quality and accelerate the healing process. The aim of this study was to investigate the effect of sleep disorders on the recovery of burn patients and the role of nursing interventions in their management.

Methods : This descriptive-analytical study was conducted on 70 patients with second- and third-degree burns admitted to the Burn Unit of Shohada-ye Mehrab Hospital, Yazd, over 5 months. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) and quality of life with the SF-36 questionnaire. Clinical parameters including wound healing time, pain intensity, anxiety, and complications were recorded. Nursing interventions included sleep hygiene education (environmental adjustment, regulating sleep/wake schedules), appropriate pain management, and psychological counseling to reduce anxiety. Data were analyzed using SPSS version 24 with independent t-test and chi-square test.

Results : Seventy-eight percent of patients experienced some degree of sleep disturbance. Patients with poor sleep had significantly longer hospital stays (15.6 ± 3.2 days vs. 12.4 ± 2.7 days; $P < 0.01$) and reported lower quality of life (mean score 61.2 vs. 74.5; $P < 0.01$). After implementing nursing interventions, PSQI scores improved significantly (from 10.5 to 6.3; $P < 0.001$), along with reductions in pain severity and anxiety. The incidence of secondary infections was 25% lower in the group with improved sleep.

Conclusion: Sleep disorders have a negative impact on wound healing and quality of life in burn patients. Specialized nursing interventions in the areas of sleep hygiene, pain control, and psychological support can improve sleep quality, reduce complications, and accelerate recovery.



The investigation of the effects of occupation- based intervention on anxiety, depression, and sleep quality of subjects with hand and upper extremity burns: A randomized clinical trial

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Purpose : Burn injuries can create numerous barriers and have many consequences such as physical, psychological, social, and emotional subsequences for these patients. These challenges could endanger the patients' health and compel them to experience multiple difficulties. In addition to the negative effects of burns in almost all aspects of daily functions in patients with burn injuries, mental health is known as a main concern for these patients, especially in whom Post-Traumatic Stress Disorder (PTSD) is very common.

Methods : In this randomized controlled intervention trial, a total of 20 patients were randomly assigned to one of the control group or intervention group. The control group only received traditional rehabilitation. However, the intervention group received traditional rehabilitation and Cognitive Orientation to daily Occupational Performance (CO-OP), respectively (during 18 sessions, 45 min/day in both groups). Occupational therapy sessions were held three times a week for a six-week duration. Occupational performance and satisfaction, anxiety, depression, and sleep quality were measured before the intervention and in weeks 2, 6, and 14 (follow-up) using Canadian Occupational Performance Measure, Beck Anxiety Inventory, Self-rating Depression Scale, and Pittsburgh Sleep Quality Index, respectively.

Results : The results of the present study show that there were significant changes in all the studied variables in the two groups. However, these changes ($P \leq 0.05$) were not statistically significant between these two groups.

Conclusion : The results of this study show that occupation-based interventions are as effective as traditional therapeutic interventions on improving the anxiety, depression, and sleep quality in patients with hand burn injuries.

Lived experiences of mothers caring for children with burn-induced disabilities

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Purpose : Burn itself is a highly painful phenomenon, but even well after the burn wounds have healed, the resultant disabilities in children continue to tax the patience and the ability to care of the mothers of handicapped children. The present study was conducted to explain and interpret mothers' experiences in caring for children with burn-induced disabilities with the interpretive phenomenological method.

Methods : The research population included the mothers of children with burn-induced disabilities selected through purposive sampling. Face-to-face unstructured interviews were conducted and recorded with an interview guide, and data saturation was achieved after interviewing six mothers. Data were analyzed based on Dickelman's method.

Results : The analysis of the data extracted from the interviews revealed that mothers' lived experience of caring for children with burn-induced disabilities could generally be divided into five themes: 1) psycho-emotional breakdown, 2) trying to maintain increasing distress, 3) life continuation in the meaning of care and compensation, 4) raising the child in the care bed, and 5) attention and trying to reach the goal despite the disability.

Conclusion : Mothers of children with burn-induced disabilities experience a wide range of emotions, concerns, and experiences. It's important to acknowledge and understand these feelings to ensure the well-being of both the mothers and their children.

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Social Determinants of Burn Injuries: A Narrative Review

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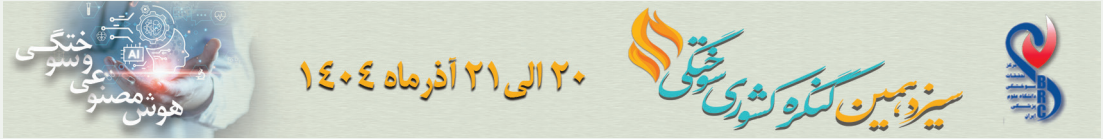
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Purpose : Burn injuries remain a significant public health issue worldwide. In recent years, contemporary health approaches have increasingly emphasized the role of social determinants in the incidence and outcomes of injuries. Despite the growing body of evidence regarding the impact of these factors on burn injuries, substantial gaps persist in the research literature. This study aims to review the social determinants associated with burn injuries.

Methods : This study was conducted using a non-systematic narrative review approach. A comprehensive search was carried out in international databases including PubMed, Scopus, and Web of Science, as well as national databases such as SID, Magiran, and Noormags. Keywords used individually and in combination included: Burn, Burn injuries, Social determinants, and Social risk factors in both English and Persian. Google Scholar was also utilized to supplement the search. Inclusion criteria consisted of studies directly related to the social determinants of burn injuries, published between 2015 and 2025. A total of 89 articles were initially identified. After screening, removing duplicates and irrelevant studies, and excluding those without full-text access, 19 studies were selected for final analysis.

Results : The findings of this narrative review reveal a strong association between burn injuries and various social and structural factors. Key contributors to the incidence and severity of burns include poverty, low educational attainment, unequal access to healthcare, housing instability, discrimination, and residence in underprivileged areas. These factors can be analyzed within the framework of Social Determinants of Health (SDOH), which encompass five main domains: economic stability, education, healthcare access and quality, social and community context, and physical environment.

Conclusion : The results underscore the need for multi-level social interventions and policy development aimed at burn prevention. Efforts to improve social infrastructure, enhance education and awareness, facilitate access to healthcare services, and support vulnerable populations can significantly contribute to reducing the incidence of burn injuries.



Post-Traumatic Growth Among Adult Burn Survivors: A Review of Psychological Outcomes and Rehabilitation

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Purpose : Burn injuries lead to significant physical damage and psychological distress, including PTSD, anxiety, and depression. However, some survivors report PTG—positive changes such as increased personal strength and renewed appreciation for life. Research specifically addressing PTG in burn populations remains limited. This review aims to examine current evidence on PTG in adult burn survivors, identify psychological and social predictors, and discuss implications for clinical practice and rehabilitation.

Methods : A systematic search was conducted in PubMed, Scopus, Web of Science, and Google Scholar for peer-reviewed English articles from 2015 to 2025. Keywords included “post-traumatic growth,” “burn injury,” “psychological adaptation,” and “coping.” Empirical studies focusing on adult burn survivors were included. From 145 initial articles, 15 relevant studies were selected for narrative synthesis based on study design, sample characteristics, and main findings.

Results : PTG is common among burn survivors, manifesting as increased personal strength, improved relationships, and spiritual growth. Effective coping strategies, social support, self-efficacy, and positive personality traits like optimism significantly predict growth. Cognitive processing and meaning-making help survivors reconstruct their identity despite ongoing distress. PTG often coexists with PTSD symptoms, reflecting complex psychological adaptation. Integrating PTG into rehabilitation can enhance recovery and quality of life.

Conclusion : Burn injuries impose significant physical and psychological challenges, yet many survivors demonstrate PTG. Facilitating PTG through targeted interventions and social support may improve rehabilitation outcomes. Future research should prioritize longitudinal studies and culturally sensitive approaches to better understand and promote PTG in diverse burn populations worldwide.



The rate of burnout, depression, and anxiety among burn care team members in a tertiary burn hospital: A descriptive cross-sectional study

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Purpose : Working in burn units has its unique challenges and may increase the rate of depression, anxiety, and burnout in burn care staff. We aimed to estimate the rate of depression, anxiety, and burnout among the members of the burn care team.

Methods : This descriptive cross-sectional survey was conducted from 1 January 2024 to 22 February 2024 in a tertiary burn hospital. The measurement tools of study were the validated Farsi versions of Beck's Depression Inventory (BDI), Beck's Anxiety Inventory (BAI), and Copenhagen Burnout Inventory (CBI).

Results : We found that the rate of depression, anxiety, and burnout was 54.2%, 62.7% and 50.7% in respondents, respectively. The correlation between burnout (CBI), depression (BDI), and anxiety (BAI) scores was significantly positive ($p < 0.01$). The rate of burnout was significantly higher in younger staff, females, bachelor's degree holders, and burn ICU staff ($P < 0.05$). Female burn care providers had higher anxiety ($P < 0.05$). The rate of depression was significantly higher in younger participants and in those with incomes less than 300 dollars ($P < 0.05$).

Conclusion : Our results indicated that a significant number of burn care team members met the criteria for anxiety, depression, and burnout. The relationship between anxiety, depression, and burnout was significantly positive. Timely and proper intervention is necessary to reduce anxiety, depression, and burnout in burn care providers.



۲۰ الی ۲۱ آذرماه ۱۴۰۴

سازمان سوزش و سوختگی



Epidemiological study of burns in children under 7 years of age admitted to Amir al-Momenin Burn and Trauma Hospital

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Purpose : Children under 7 years of age are the most susceptible group to thermal injuries due to their inherent unlimited curiosity to explore the environment, high mobility and lack of experience in understanding danger. It is necessary and essential to examine cases of burns in children in each region and province. Since all care and education are limited to the family, we decided to conduct a study on the prevalence and epidemiology of burns in this age group in the province so that we can adopt important and effective strategies to prevent and solve this social problem by being aware of the causes and risk factors for burns in this group of people.

Methods : The present study was conducted on hospitalized patients admitted to Amir al-Momenin Burn and Accident Hospital. Gender, age, percentage of burns, place of residence, burn agent, place of accident, cause of accident, and rate of recovery will be studied and analyzed, and statistical analyses will be performed using SPSS software.

Results : Our studies on children under 7 years of age in burn hospitals showed that the majority of burns occurred in children 1 to 2 years of age, with hot liquids (70%) and at home (92%). The location of the burns in most patients was 30% on the head and neck, and upper limbs and torso.

Conclusion : Due to their curiosity, early age of becoming very active, and lack of experience in understanding danger, children seem to be the most susceptible group to burns, and they are most often burned at home with hot liquids.



Legal Dimensions of Burn Injuries: A Systematic Review of Compensation, Liability, and Policy Frameworks

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Purpose : Burn injuries pose significant medical and legal challenges, particularly concerning compensation, liability, and policy. This study aims to systematically review existing literature to elucidate the legal aspects associated with burn injuries, focusing on compensation mechanisms, liability determinations, and relevant policy frameworks.

Methods : A comprehensive systematic review was conducted following the PRISMA guidelines. Databases including PubMed, Scopus, and Google Scholar were searched for articles published between 2000 and 2024. Keywords such as “burn injuries,” “legal liability,” “compensation,” and “policy” were utilized. Inclusion criteria encompassed studies addressing legal outcomes of burn injuries, while exclusion criteria filtered out articles lacking legal context or relevance.

Results : Out of 1,200 articles identified, 45 met the inclusion criteria. Among these, 60% (27 studies) focused on compensation mechanisms, 40% (18 studies) examined liability issues, and 35% (16 studies) analyzed policy frameworks. The review revealed significant disparities in compensation amounts, with variations ranging from \$5,000 to \$500,000, influenced by jurisdiction and severity of injury. Liability determinations were often complicated by factors such as workplace safety standards and product defects. Policy analyses indicated a lack of standardized legal frameworks, leading to inconsistent outcomes for burn injury victims.

Conclusion : The legal landscape surrounding burn injuries is fragmented and lacks uniformity, resulting in disparities in victim compensation and legal accountability. There is a pressing need for standardized legal frameworks to ensure equitable treatment of burn injury cases. Future research should focus on comparative legal analyses to inform policy development and harmonization of legal standards.



Recent Advances in Nursing Care for Burn Emergencies: From Triage to Stabilization

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Purpose : Burn injuries are life-threatening emergencies requiring prompt, evidence-based interventions. Nurses play a pivotal role in managing burn patients from initial triage to stabilization, yet evolving practices and technologies continuously reshape care paradigms. This review synthesizes recent advancements in nursing care for burn emergencies, focusing on innovations in triage protocols, infection control, pain management, and interdisciplinary collaboration to improve outcomes.

Methods : A systematic literature search was conducted using PubMed, CINAHL, and Scopus (2015–2023). Keywords included “burn emergencies,” “nursing care,” “triage,” “stabilization,” and “innovation.” Inclusion criteria prioritized peer-reviewed articles, clinical guidelines, and meta-analyses. Studies focusing on non-emergency burns or non-nursing interventions were excluded.

Results : 1. Triage Innovations: AI-driven tools (e.g., Burn Navigator Apps) enhance accuracy in assessing burn depth and total body surface area (TBSA), reducing delays in resuscitation (Smith et al., 2021). 2. Infection Control: Antimicrobial dressings impregnated with nanocrystalline silver or honey reduce sepsis rates by 30% compared to traditional methods (Jones & Patel, 2022). 3. Pain Management: Virtual reality (VR) distraction therapy and opioid-sparing protocols decrease reliance on high-dose analgesics, improving patient compliance (Lee et al., 2020). 4. Fluid Resuscitation: Closed-loop fluid delivery systems, guided by real-time hemodynamic monitoring, minimize complications like compartment syndrome (Gupta et al., 2023). 5. Psychosocial Support: Early integration of mental health professionals into burn teams reduces PTSD incidence by 25% (WHO, 2023).

Conclusion : Advances in nursing care for burn emergencies emphasize technology integration, personalized interventions, and holistic approaches. However, challenges persist in resource-limited settings and staff training. Future research should focus on scalable innovations and global guideline standardization.