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A comprehensive approach to assessing and reducing neuropsychic burden in the work activity of driver examination center employees

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Abstract: Driver examination center employees perform high-responsibility cognitive-emotional work under tight time pressure, intense client interaction, and continuous regulatory oversight. Following the digitisation and procedural simplification of national driver licensing in Uzbekistan, the throughput and workload of these centres have grown substantially, raising concerns about chronic occupational stress and burnout among staff. This article proposes a three-level integrated assessment framework that combines validated psychometric instruments (MBI-GS, PSS-10), objective physiological biomarkers (heart rate variability, salivary cortisol), and cognitive-behavioural indicators. Drawing on established occupational stress models (Karasek; Siegrist; Demerouti et al.) and prior transport-sector occupational studies, the proposed framework classifies stressors into organisational, interpersonal, and individual domains and maps each domain to evidence-based mitigation strategies. The model offers a structured methodological basis for monitoring employee well-being and supports the broader goal of improving road traffic safety through human-factor management.

Keywords: neuropsychic burden, occupational stress, burnout, emotional labour, driver examination, road safety, heart rate variability, MBI-GS, PSS-10, human factor, transport safety

Haydovchilik imtihon markazi xodimlari mehnat faoliyatida asab-ruhiy yuklanishni baholash va kamaytirishga kompleks yondashuv

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Annotatsiya: Haydovchilik imtihon markazi xodimlari yuqori mas'uliyatli kognitiv-emotsional mehnatni qat'iy vaqt bosimi, mijozlar bilan jadal muloqot va doimiy normativ nazorat sharoitida bajaradi. O'zbekistonda milliy haydovchilik guvohnomasini rasmiylashtirish jarayonini raqamlashtirish va soddalashtirishdan so'ng ushbu markazlarning xizmat ko'rsatish hajmi va xodimlardagi yuklama sezilarli darajada oshdi, bu surunkali kasbiy stress va kasbiy kuyish xavfini kuchaytiradi. Mazkur maqolada uch darajali kompleks baholash modeli taklif etiladi: u tasdiqlangan psixometrik metodikalarni (MBI-GS, PSS-10), ob'yektiv fiziologik biomarkerlarni (yurak urish tezligi o'zgaruvchanligi, so'lakdagi kortizol) va kognitiv-xulqiy ko'rsatkichlarni birlashtiradi. Klassik kasbiy stress nazariyalari (Karasek; Siegrist; Demerouti va b.) hamda transport sohasi xodimlari salomatligiga oid mavjud tadqiqotlarga tayanib, taklif etilayotgan model stress omillarini tashkiliy, shaxslararo va shaxsiy guruhlariga ajratib, har biri uchun ilmiy asoslangan kamaytirish strategiyalarini belgilaydi. Taklif etilgan yondashuv xodimlar farovonligini monitoring qilish uchun metodik asos bo'lib, inson omilini boshqarish orqali yo'l harakati xavfsizligini oshirishga xizmat qiladi.

Kalit so'zlar: asab-ruhiy yuklanish, kasbiy stress, kasbiy kuyish, emotsional mehnat, haydovchilik imtihoni, yo'l harakati xavfsizligi, yurak urish tezligi o'zgaruvchanligi, MBI-GS, PSS-10, inson omili, transport xavfsizligi

1. Kirish

Yo'l harakati xavfsizligi davlatning ijtimoiy-iqtisodiy barqarorligini ta'minlovchi muhim omillardan biri bo'lib, uning markaziy bo'g'ini haydovchilarni nazariy va amaliy imtihon orqali baholash hisoblanadi. O'zbekiston Respublikasi Vazirlar Mahkamasining 2023-yil 12-

apreldagi 152-son qarori bilan milliy haydovchilik guvohnomasini rasmiylashtirish tartibi soddalashtirildi va raqamli xizmatlarga keng o'tildi [1]. Bu islohot fuqarolar uchun qulaylik yaratish bilan birga, yagona imtihon markazlarining xizmat ko'rsatish hajmini va xodimlarga tushadigan ish yuklamasini sezilarli darajada oshirdi.

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Imtihon markazi xodimlari — inspektorlar, ma'muriy va mijozlarga xizmat ko'rsatuvchi xodimlar — kun davomida o'nlab, ba'zan yuzlab imtihon topshiruvchilarni qabul qiladi. Ularning faoliyati uchta o'zaro bog'liq kompleks talabni o'z ichiga oladi: (a) qat'iy reglamentlangan protseduralarga aniq amal qilish, (b) imtihon natijasidan qoniqmagan mijozlar bilan emotsional muvozanat saqlash, va (c) qabul qilingan har bir qaror uchun yuqori mas'uliyatni his qilish. Bunday mehnat shakli xizmat ko'rsatish sohasi uchun xos bo'lgan "emotsional mehnat" toifasiga kiradi [2; 3], va u kasbiy kuyishning eng kuchli omillaridan biri sifatida tan olingan [4; 5].

Transport sohasidagi turli kasb egalari salomatligi va kasbiy stressi mavzusi so'nggi yillarda jadal o'rganilmoqda. Jumladan, lokomotiv brigadalar xodimlarining gigienik holati maxsus tadqiqot ob'yekti sifatida ko'rib chiqilgan [6], vagon yig'uvchilarning (poyezd tuzuvchilarning) mehnat faoliyatida mexanik quvvat sarfini hisoblash uchun matematik model ishlab chiqilgan [7], aeroport infratuzilmasi xavfsizligini boshqarish uchun raqamli xavf matritsasi taklif etilgan [8]. Biroq haydovchilik imtihon markazi xodimlari mehnatida asab-ruhiy yuklanish, uning manbalari va kamaytirish strategiyalari integratsiyalashtirilgan ko'rinishda hozircha tizimli o'rganilmagan.

Mazkur maqolaning maqsadi — haydovchilik imtihon markazi xodimlari mehnat faoliyatida asab-ruhiy yuklanishni baholash va kamaytirishning kompleks metodologik asoslarini ishlab chiqishdir. Tadqiqot vazifalari quyidagilardan iborat: (1) kasbiy stress va kuyishning klassik nazariy modellari ushbu kasbiy guruh kontekstida sintez qilish; (2) sub'yektiv, fiziologik va kognitiv darajalarni qamrab oluvchi uch komponentli baholash modelini taklif qilish; (3) stress omillarini tasniflash va har bir guruh uchun ilmiy asoslangan kamaytirish strategiyalarini belgilash; (4) taklif etilgan yondashuvni transport sohasidagi mavjud kasbiy salomatlik va xavfsizlikni boshqarish yondashuvlari bilan moslashtirish.

2. Tadqiqot metodologiyasi

Ushbu maqola konseptual-metodologik tadqiqot bo'lib, quyidagi bosqichlardan iborat. Birinchidan, kasbiy stress, kuyish va emotsional mehnatga oid xalqaro manbalar tahlil etildi va imtihon markazi mehnatining o'ziga xos jihatlarga moslashtirildi. Ikkinchidan, baholashning uchta darajasi (sub'yektiv-psixometrik, ob'yektiv-fiziologik va kognitiv-xulqiy) integratsiyalashtirildi. Sub'yektiv darajada Maslach kasbiy kuyish so'rovnomasining umumiy versiyasi (MBI-GS) [4; 5], Cohen, Kamarck va Mermelsteinning idrok etilgan stress shkalasi (PSS-10) [14] va uning psixometrik tahlili [15] tavsiya etiladi. Ob'yektiv darajada yurak urish tezligi o'zgaruvchanligi (HRV) tavsiya etiladi: Järvelin-Pasanen, Sinikallio va Tarvainenning tizimli sharhiga ko'ra,

kasbiy stress HRV pasayishi va parasimpatik aktivatsiyaning kamayishi bilan bog'liq [16]. So'lakdagi kortizol esa gipotalamus-gipofiz-buyrak usti gormonal o'qi faoliyatining noinvaziv biomarkeri sifatida ishlatiladi [17]. Kortizol o'lchashda namuna olish va analiz qilish bo'yicha ekspert konsensus yo'l-yo'riqlariga rioya etiladi [22]. Kognitiv-xulqiy darajada e'tibor barqarorligi, reaksiya tezligi va xato darajasini baholashga qaratiladi. Stroop testi qabul qilingan ijroviy nazorat o'lchovi sifatida [23; 24], oddiy va tanlangan reaksiya tezligi esa kognitiv ishlov berish tezligining tasdiqlangan ko'rsatkichi sifatida [25] tavsiya etiladi. Uchinchidan, har bir baholash darajasi stress omillarining tashkiliy, shaxslararo va shaxsiy guruhlar bilan moslashtirildi va mos kamaytirish strategiyalari belgilandi. Qo'llaniladigan metodikalarning to'liq ro'yxati va ularning psixometrik xususiyatlari 1-jadvalda umumlashtirilgan.

3. Natija va muhokamalar

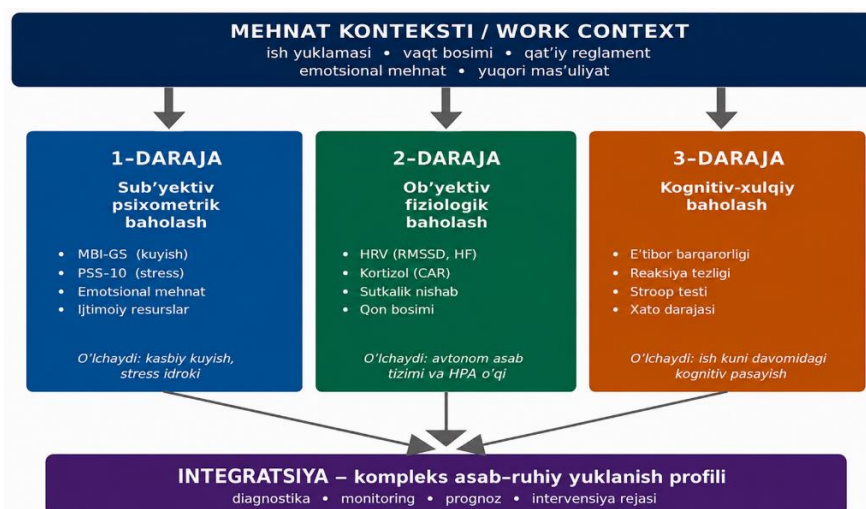
3.1. Uch darajali kompleks baholash modeli.

Adabiyotlar tahlili va transport sohasidagi qiyosiy yondashuvlar asosida imtihon markazi xodimlari uchun uch darajali kompleks baholash modeli ishlab chiqildi. Modelning birinchi darajasi — sub'yektiv psixometrik baholash — kasbiy kuyish (MBI-GS), idrok etilgan stress (PSS-10), emotsional mehnat (yuzaki va chuqur harakat shkalalari) va ijtimoiy qo'llab-quvvatlash darajasini o'lchaydi. Bu instrumentlar standartlashtirilgan, psixometrik xususiyatlari ko'plab populyatsiyalarda tasdiqlangan [4; 5; 14; 15]. Modelning umumiy sxemasi 1-rasmda, har bir darajada qo'llaniladigan metodikalarning psixometrik xususiyatlari 1-jadvalda keltirilgan.

Ikkinchi daraja — ob'yektiv fiziologik baholash — sub'yektiv hisobotlarning ijtimoiy maqbullik xatosini kompensatsiya qiladi. HRV ko'rsatkichlari (RMSSD, HF-quvvat) avtonom asab tizimining muvozanati va parasimpatik tonusni aks ettiradi [16]. Ertalabki va kechqurungi so'lak kortizoli sutkalik ritm profilini chizish imkonini beradi [17]. Ushbu yondashuv metodologik jihatdan lokomotiv brigadalar gigienik tekshiruvda [6] qo'llanilgan ob'yektiv o'lchov mantig'iga mos keladi va imtihon markazi sharoitiga moslashtiriladi.

Uchinchida daraja — kognitiv-xulqiy baholash — ish kuni mobaynida e'tibor, reaksiya tezligi va xato darajasidagi o'zgarishlarni o'rganadi. Imtihon qabul qilish mas'uliyatli kognitiv mehnat bo'lganligi sababli, charchoq natijasida yuzaga keladigan kognitiv funksiyalar pasayishi nafaqat xodim salomatligi, balki imtihon natijalarining ob'yektivligi uchun ham tahdid hisoblanadi. Ushbu daraja vagon yig'uvchilar mehnatida mexanik quvvat sarfini modellashtrishga o'xshash son-sifat yondashuvini [7] taqozo etadi.





1-rasm. Haydovchilik imtihon markazi xodimlari uchun uch darajali kompleks baholash modeli (muallif yondashuvi)

1-jadval

Uch darajali baholash modelida qo'llaniladigan metodikalarning psixometrik xususiyatlari

Daraja	Metodika / sub-shkala	Asosiy ko'rsatkich	Ishonchlilik	Manba
1-daraja	MBI-GS: Emotsional charchoq (EE)	<i>kasbiy kuyish (emotsional charchoq)</i>	$\alpha = 0,86-0,92$	Maslach va b. [4; 5]
	MBI-GS: Sinisizm / depersonalizatsiya	<i>kasbiy kuyish (kognitiv masofalanish)</i>	$\alpha = 0,74-0,84$	Maslach va b. [4; 5]
	MBI-GS: Shaxsiy yutuqlar (PA)	<i>kasbiy samaradorlik hissi</i>	$\alpha = 0,70-0,78$	Maslach va b. [4; 5]
	PSS-10 (Perceived Stress Scale)	<i>idrok etilgan global stress</i>	$\alpha = 0,74-0,91$	Cohen [14]; Lee [15]
	Emotsional mehnat shkalasi: yuzaki harakat	<i>display qoidalariga zo'riqib moslashish</i>	$\alpha = 0,79-0,91$	Grandey [3]; Hülshager [13]
	Emotsional mehnat shkalasi: chuqur harakat	<i>haqiqiy his-tuyg'ularni shakllantirish</i>	$\alpha = 0,74-0,85$	Grandey [3]; Hülshager [13]
2-daraja	HRV — RMSSD, HF quvvat	<i>avtonom asab tizimi muvozanati</i>	ICC = 0,55–0,85 (qisqa muddatli yozish)	Järvelin-Pasanen va b. [16]
	So'lakdagi kortizol — CAR	<i>HPA o'qi reaktivligi (uyg'onish)</i>	ICC = 0,39–0,62	Hellhammer va b. [17]
	So'lakdagi kortizol — sutkalik nishab	<i>sutkalik HPA ritmi</i>	ICC $\approx$ 0,46–0,65 (5-kunlik o'rtacha)	Hellhammer va b. [17]; Stalder va b. [22]
3-daraja	Stroop testi (interferensiya)	<i>e'tibor barqarorligi, ijroviy nazorat</i>	$\alpha = 0,64-0,85$; test-qayta test $r = 0,69-0,88$	Strauss va b. [23]; Savaş va b. [24]



	Oddiy/tanlangan reaksiya tezligi	kognitiv ishlov berish tezligi	ICC = 0,81–0,90 (kompyuterlashtirilgan SRT/CRT)	Woods va b. [25]
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Izohlar: α — Cronbach's alpha (ichki uyg'unlik); ICC — intraklass korrelyatsiya koeffitsiyenti (qayta-takror ishonchliligi). Diapazonlar tegishli manbalardagi meta-tahlillar va validatsiya tadqiqotlaridan olingan.

3.2. Stress omillarining tasnifi.

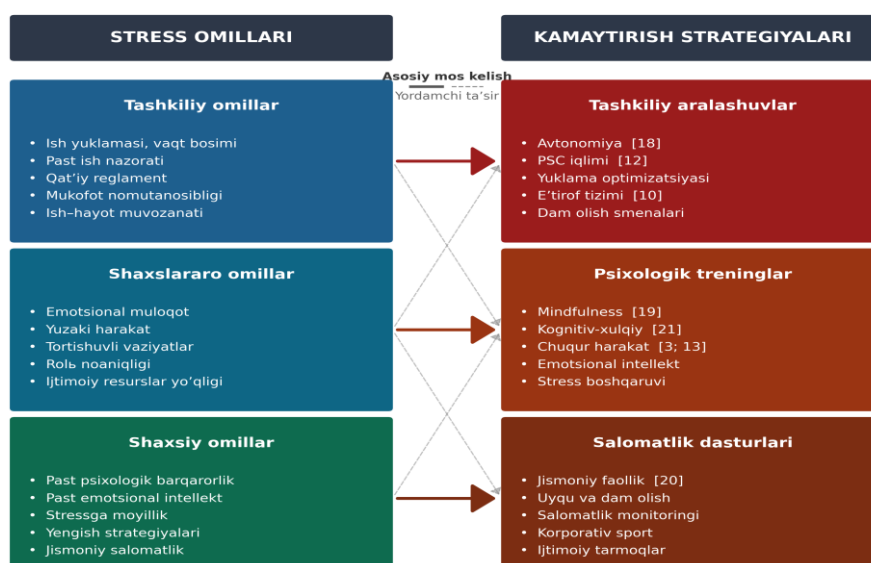
Olib borilgan adabiyotlar tahlili va kasbiy mehnatning o'ziga xosligi imtihon markazi xodimlari uchun stress omillarini uch guruhga ajratish imkonini beradi. Tashkiliy omillar guruhiga ish yuklamasi va vaqt bosimi, ish jarayoni ustidan past nazorat, qat'iy reglament, qaror qabul qilish bo'yicha cheklangan avtonomiya, axborot oqimi, ish va shaxsiy hayot muvozanati buzilishi, shuningdek harakat-mukofot nomutanosibligi kiradi [9; 10]. Shaxslararo omillar guruhi imtihon natijasidan qoniqmagan mijozlar bilan emotsional muloqotni boshqarish, tortishuvli vaziyatlarda "yuzaki harakat" zarurati, hamkasblar va rahbariyat tomonidan ijtimoiy qo'llab-quvvatlash darajasi, hamda rol noaniqligi va mojarosi bilan ifodalanadi [2; 3; 13]. Shaxsiy omillar guruhiga psixologik barqarorlik, emotsional intellekt, stressga moyillik, yengish strategiyalari va jismoniy salomatlik resurslari kiradi.

3.3. Kamaytirish strategiyalari.

Har bir stress omillari guruhi uchun ilmiy asoslangan kamaytirish strategiyalari taklif qilinadi. Tashkiliy darajada Spectorning meta-tahlili xodimga ish jarayoni ustidan idrok etilgan nazorat berish ish qoniqishi va salomatlikning eng kuchli prediktorlaridan biri ekanligini ko'rsatadi [18]. Dollard va Bakker ishlab chiqqan psixososial xavfsizlik

iqlimi (PSC) konsepsiyasi rahbariyatning xodim salomatligiga e'tibori organizatsion darajada eng asosiy resurs ekanligini ta'kidlaydi [12]. Amalda bu — ish yuklamasini optimallashtirish, smenalar oralig'ida yetarli dam olish, qarorlar shaffofligi, e'tirof va rag'bat tizimi orqali amalga oshiriladi.

Shaxslararo va shaxsiy darajada eng samarali aralashuvlar sifatida ongli e'tibor (mindfulness) treninglari va jismoniy faollik dasturlarini ko'rsatish mumkin. Spinelli, Wisener va Khouryning tasodifiy boshqaruvli klinik tadqiqotlar meta-tahlili mindfulness asoslangan treninglar sog'liqni saqlash xodimlari va o'qituvchilarda stress, kuyish va emotsional charchoqni statistik ahamiyatli darajada kamaytirishini tasdiqladi [19]. Schuch va boshqalarning prospektiv kogortali tadqiqotlar meta-tahlili esa muntazam jismoniy faollik depressiya rivojlanishi xavfini kamaytirishini ko'rsatdi [20]. Richardson va Rothsteinning kasbiy stressni boshqarish aralashuvlari samaradorligi bo'yicha meta-tahlili kognitiv-xulqiy aralashuvlar eng yuqori ta'sir o'lchamiga ega ekanligini aniqladi [21]. Stress omillarining tasnifi va ularning kamaytirish strategiyalari bilan moslashtirilgan umumiy xaritasi 2-rasmda taqdim etilgan.



2-rasm. Stress omillarining tasnifi va ularning kamaytirish strategiyalari bilan o'zaro bog'liqligi (muallif yondashuvi)

3.4. Transport xavfsizligini boshqarish konteksti.

Taklif etilayotgan model nafaqat alohida xodim farovonligini, balki butun imtihon tizimining samaradorligi va imtihon natijalarining ob'yektivligini ham oshirishga xizmat qiladi. Salmorbekova va Talipov tomonidan aeroport infratuzilmasi uchun ishlab chiqilgan raqamli xavf matritsasi va xavfsizlikni boshqarish ish oqimi transport sohasida xavf-xatarni tizimli baholashning yaqinda chiqqan namunasi

hisoblanadi [8]. Mazkur yondashuv inson omilini, ya'ni xodimlar asab-ruhiy holatini boshqarish uchun kengaytirilganda, yo'l harakati xavfsizligi tizimining yagona, ko'p qatlamli xavf boshqaruvi vujudga keladi: infratuzilma → protsedura → inson omili. Lokomotiv brigadalari gigienik tekshiruv misolida ko'rsatilganidek [6], xodim salomatligi va xavfsizligi transport tizimining yagona muhandislik-tibbiy masalasidir.



4. Xulosa

Mazkur maqolada haydovchilik imtihon markazi xodimlari mehnat faoliyatida asab-ruhiy yuklanishni baholash va kamaytirishga uch darajali kompleks yondashuv taklif etildi. Yondashuv klassik kasbiy stress nazariyalarini (Karasek; Siegrist; Demerouti va b.) va emotsional mehnat tushunchasini (Hochschild; Grandey) imtihon markazi mehnatining o'ziga xos ko'p tomonli xususiyatlariga moslashtiradi. Taklif etilgan model sub'yektiv psixometrik, ob'yektiv fiziologik va kognitiv-xulqiy darajalarda baholashni integratsiya qilib, stress omillarini tashkiliy, shaxslararo va shaxsiy guruhlariga ajratadi va har biri uchun ilmiy asoslangan kamaytirish strategiyalarini belgilaydi. Amaliy jihatdan ushbu model imtihon markazi rahbariyati uchun xodimlar farovonligini monitoring qilish va boshqarishning metodik asosini, davlat darajasida esa transport xavfsizligini inson omili nuqtai nazaridan mustahkamlashning yangi yo'nalishini taqdim etadi.

Kelgusi empirik tadqiqotlar taklif etilayotgan modelni O'zbekistondagi turli hududlardagi yagona imtihon markazlarida sinab ko'rishi, aralashuvlarning amaliy samaradorligini uzunlamasiga dizaynda baholashi, hamda natijalarni boshqa davlat xizmati ko'rsatish sohalari (pasport, soliq, davlat xizmatlari markazlari) bilan qiyoslashi maqsadga muvofiq.

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