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The development of an HIV risk environment scale of exotic dance clubs

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Keywords

HIV risk environment; exotic dance clubs; strippers; validation

Introduction

Over the past decade, researchers have increasingly focused on the nature of the environments in which HIV and sexually transmitted infection (STIs) risk behaviors are produced and transmission occurs. Such a focus minimized the formerly singular emphasis on individual behaviors and cognitions, and ignored the contexts in which individuals are positioned (1-5). The important shift not only expands our lens to include downstream drivers such as poverty and homelessness in characterizing HIV/STI risk, but also indicates the types of environments that have the potential to foster risk or facilitate risk reduction. Tim Rhodes offers a useful framework for exploring types of risk environments, defined as “the space, either social or physical, in which factors increase the risk of harm occurring” (5, 6). The risk environment framework delineates four types of environments: physical, economic, social, and policy. These operate at the micro-level of interpersonal relationships, meso-level of social interactions (i.e., group norms) or institutions, and macro-level of social structures such as laws and social inequities. The risk environment is dynamic, in that it is a product of the interplay of the three levels which produce environmental conditions that can generate risk (4).

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There are no conflicts of interest.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent was obtained from all individual participants included in the study.

Rhodes' framework was developed to characterize environmental risks for HIV among people who inject drugs. This framework has also been used to examine characteristics of environments on HIV transmission among sex workers (7-12). For example, studies have implicated the role of physical spaces in which sex is sold (e.g., street-based, brothel-based, massage parlors), the legality of sex work, and the role of police. However, the preponderance of risk environment literature is theoretical, conceptual, qualitative, or uses "proxy" measures as indicators for environmental risk. (5, 6, 9, 13) This body of work could be strengthened by quantitative studies aimed to directly measure environmental domains.

There has been limited research investigating the nature of exotic dance clubs (EDCs) as indoor HIV/STI risk environments (13-18), despite many functioning as illicit indoor sex exchange venues. An estimated 4,000 EDCs are operating in the United States, which predominantly feature female exotic dancers (FEDs). These EDCs offer an array of services varying from stage or lap dancing, drinking with dancers, or the sale of sex which can range from non-penetrative to penetrative (18-21). We and others have found that some EDCs that feature FEDs are characterized by sex exchange and illicit drug use. In our pilot research conducted on a concentrated block of urban and socially marginalized EDCs called "The Block" in Baltimore City, we found that among the 43% of FEDs (N=101) who reported selling sex, 92% began doing so after initiating dancing (14). Among the 50% who reported heroin and/or cocaine use, over half initiated this drug use while dancing. These data informed subsequent ethnography comprised of observations, key informant interviews, and in-depth interviews that explored the nature of the complex EDC risk environment (13, 16).

Grounded within the risk environment framework (4-6) and guided by our previous ethnographic work within EDCs (13, 16, 17), the current study examined the validity and reliability of a scale aiming to measure the EDC risk environment as well the four risk environment subdomains (e.g., policy, social, economic, drug), focusing on the micro- and meso- environments within individual EDCs. In order to assess reliability, we looked at the internal consistency of the four subdomains as well as the overall scale. Through confirmatory factor analysis, we then assessed whether each of the four subdomains contributed significantly to one single broad assessment of the HIV/STI risk environment. Further, through multi-group confirmatory factor analysis, we examined if FEDs, the group most exposed to HIV/STI risk within EDCs, organize these environmental risk domains in different ways compared to other EDC staff (e.g., bartenders, managers, doormen) that are exposed to less HIV/STI risk. The study laid the foundation for the subsequent use of this scale in ranking EDCs in terms of risk (high, medium, low) in order to examine the effects of the EDC risk environment on new FEDs.

Methods

Study population and data collection

Field staff visited 32 EDCs operating in Baltimore City and County from March 2013 through to September 2013. EDCs were identified through our past work as well as a national website of EDCs. Management working at each club were approached by a pair of study staff and informed of the study goals. Twenty-six EDCs (81%) agreed to participate. Pairs of study staff recruited and screened EDC staff during two to six visits per club. Club

visits differed by time of day, shift (e.g., day or night), and day of the week as much as possible to maximize diversity of survey participants. On occasion when study staff were denied entry, the study team arranged another time to visit and complete study activities. Reasons for temporarily being denied entry included needing to obtain additional permission from management, the club being too busy at the time of visit, and managers not being on duty.

EDC staff were eligible if they were employed as a dancers or other club staff (e.g., bartenders, doormen, managers, bouncers) for at least six months in the EDC in which they were recruited. A six-month tenure was an inclusion criterion because of the associated familiarity with the specific EDC, given the survey content. Upon screening, eligible and interested participants provided verbal consent to join the study and completed a brief anonymous survey. Women who reported staff positions (e.g., bartender) in addition to dancing were considered dancers. Survey participants were excluded from analysis if they confirmed during the survey that they had worked less than six months (n=18) in the EDC, were from participating EDCs with less than four study participants (n=8), or responded to 40% or less of questions about any single domain (n=11). We excluded clubs with less than four participants since we did not feel that four participants could sufficiently characterize the EDC risk environment.

Instrument/Scale

The risk environment measure was comprised of social, economic, policy, and drug domains, with the first three identified by Rhodes as dimensions of the risk environmental risk. The drug domain was not a part of Rhodes' original risk environment framework given that the construct was developed specifically with injection drug users in mind; however, we added this domain to the original typology in recognition of the prominent role of drug use in EDCs in Baltimore (5, 6). A separate tool, not included in this analysis, was developed to measure the physical environment (e.g., lighting, presence of private rooms) that was measured by staff observations given the nature of the dimension.

The anonymous survey contained demographic and EDC employment questions as well as 57 statements representing the four environmental risk domains: policy (8 items), drugs (13 items), social (19 items), and economic (17 items). Survey items were based on our previous ethnography conducted in Baltimore EDCs (13) as well as extensive discussions with several long-term exotic dancers.

Each item offered 4-point Likert-type responses (i.e., strongly agree, agree, disagree, strongly disagree or extremely common, somewhat common, somewhat uncommon, extremely uncommon) plus options for deferring (i.e., does not happen here, refuse to answer, and don't know). Response categories “don't know” and “refuse” were set to missing. After extensive analysis of the pattern of responses, “does not happen here” was re-coded as least risky, resulting in five response options ranging from 1 (least risk) to 5 (most risk). To avoid response bias, six items were worded positively, which were reversed in data analysis.

Examples of survey items in the drug section include, “how common is heroin injection among dancers in this club?” and “is dancers' use of hard drugs in this club discouraged by management?” The economic domain included items such as, “dancers having sex with customers in this club make more money if they have sex without a condom” and “dancers can negotiate their tips from lap dances with customers in this club.” Examples of survey items included in the social domain were: “dancers talk to each other about using condoms with customers” and “dancers compete with each other for customers.” Examples of survey items included in the policy domain were: “dancers who are too high or too drunk are asked to leave their shift” and “the club management support the dancers having safe sex.”

Statistical Analysis

Demographic (e.g., age) and EDC employment characteristics (e.g., length of time working as a dancer) were analyzed for the entire sample and stratified by staff status (dancer vs. other staff), with chi-squared tests of significance used to examine differences.

Reliability—Internal consistency reliability was assessed through Cronbach's alpha (α) for each of the four sub-domains and the broader overall latent risk factor. Internal consistencies were computed after missing data were deleted pairwise. Items detracting from internal consistency (i.e., $\alpha < 0.70$) were removed through an iterative process of comparing the alpha between two random split halves of the data (22). Composites of the remaining individual item scores were generated, and observed variables were built to reflect the average standardized score of each domain. Reliability was also evaluated separately for dancer and staff subgroups. Comparable reliability of individual domains across these two groups would support the suitability of making comparisons between dancer and staff subgroups.

Confirmatory Factor Analysis—Confirmatory factor analysis (CFA) was used to validate our hypothesis that each of the four risk domains reflects a single, broader, latent risk factor of environmental risk. Two models were estimated, with the second model allowing the errors associated with the social and the economic domains to correlate. Allowing this error correlation seemed advisable given the strong correlation between the two sets of items. Parameter estimates included factor loadings of the four environmental domains on the latent overall risk construct and associated R-squared values (i.e., communality), with the latter specifying the proportion of the domain variance accounted for by the overall latent risk factor. Error variances for each domain were also estimated. Significance testing of coefficients linking each domain to latent risk and the size of the coefficients informed conclusions about whether each observed environmental risk domain contributed to the overall latent risk factor. After estimating a model for all participants, separate CFA model estimation and parameter testing were conducted for dancers and staff.

To evaluate how adequately the parameter estimates for each CFA model reproduce the observed data patterns, the following goodness-of-fit tests were estimated and compared to recommended cutoffs for good fit (23-27): 1) chi-square test (χ^2, $p>0.05$); 2) root mean square error of approximation (RMSEA< 0.06); 3) standardized root mean square residual (SRMR < 0.08); 4) Comparative Fit Index (CFI > 0.90); and 5) Tucker-Lewis Index (TLI >

0.90). Fit statistics were interpreted collectively to inform conclusions about model fit (28). Fit indices were examined for the overall sample, and for the separate models for dancer and staff subgroups. For the whole sample, and for each group-specific model, an alternative model with error covariance between social and economic domain was produced for comparison, yielding a total of six models under evaluation, using the asymptotic distribution free estimator given that we did not assume joint normality. To further investigate whether dancers and staff construct risk differently by linking specific environmental domains to overall latent risk in different ways, subgroup invariance tests compared estimates from dancer and staff models. Specifically, we assessed whether the fit of the model to the data was statistically significantly worse (29) for a constrained model -- domain factor loadings constrained to equality for both groups -- compared to an unconstrained model where each group had its own loading. A statistically significant loss of model fit when comparing a constrained vs. unconstrained model suggests dancers and staff link at least some of the four environmental domains to overall latent risk in different ways. We expect this to be the case since dancers' exposure to HIV/STI risks are so much higher and possibly prioritize risk differently from staff.

Descriptive analyses were conducted using SAS version 9.3 and confirmatory factor analysis (CFA) was performed using Stata/IC version 12.1. The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Results

Sample

The resulting sample was comprised of dancers and staff (N=279) from 22 EDCs. The number of participants per club ranged from six to 20 (median per EDC =13, IQR: 10-14). Sixty-two percent reported working as dancers (n=172) and 38% were staff (n=107). The median age reported by all personnel was 27 years (IQR: 23-24). Dancers were significantly younger (median=25 years) than staff (median=34 years) ($p< 0.001$) and staff were 65% male. The median length of time worked in EDCs was significantly shorter for dancers (4.4 years) than staff (6.8 years, $p< 0.001$). Dancers, however, had been employed in more EDCs in their lifetime (n=4) than staff (n=3). The most common staff positions reported were: doormen (25%), bartenders (22%), managers (10%), and owners (4%). Staff categories were not mutually exclusive.

Reliability

Tests of reliability are displayed in Table I. The drug, economic, and social domains generated indices with Cronbach's α above 0.80 and the Cronbach's α for the policy domain was 0.65. The four domains together created an internally consistent overall observed general risk score (α = 0.77). Internal consistency was not significantly different between dancers (α = 0.77) and staff (α = 0.78) for the overall scale or for each domain (data not shown). Descriptively, the bivariate associations between domains varied. The policy domain had a low correlation with the other three domains (r=0.25-0.34). The economic domain had a fairly strong correlation with the other two domains ($r_{econ/drug}$=0.54; $r_{econ/pol}$=0.34), and demonstrated the strongest relationship with the social domain ($r_{econ/soc}$=0.79).

Confirmatory Factor Analysis

Figure 1 illustrates the path diagram of the CFA model using all dancers and staff and correlated errors between the social and the economic domain. Factor loadings of the four environmental domains (box) on the latent factor of overall environmental risk (oval) are shown within the first set of arrows. Each domain contributed significantly ($p < .001$) to overall latent risk. This confirms the construct-relevance (30) of each domain to the broader risk assessment. Magnitudes of the factor loadings varied from 0.81 (economic) to 0.42 (policy) but were all sizable and positive. For example, a standardized unit increase in overall risk was associated with a 0.69 standardized score increase in the drug domain. Proportions of each domain's variance explained by the overall latent risk factor ranged from 65% (economic) to 17% (policy). Standardized error variances (bottom of the path diagram) ranged from 0.35 for economic to 0.83 for policy.

We also examined the factor loadings of the environmental domains on the latent overall risk factor for dancer-only and staff-only models, with errors for the social economic domains allowed to correlate given theoretical similarity in the items (Table II). For both groups, each domain contributed significantly to the overall latent construct, confirming the construct relevance of each domain to the broader latent construct. Magnitudes of the factor loadings varied for each group. For dancers, economic matters had the highest loading (0.81) and policy the lowest (.41). Among staff, drugs had the highest loading (.84) and policy the lowest (.48). Correlated residuals between social and economic domains for dancers were not statistically significant (δ_{24} =0.31, p=0.544) when variance was set at 1 for the completely standardized solutions. In contrast, correlated errors for staff were significant (δ_{24} =0.552, p<0.001) suggesting that they share variance accounted for by the residual not predicted by the latent factor risk, reflecting similar perceptions of social and economic risk within EDCs. Comparing the two group models, the economic domain contributed more to the latent risk construct for dancers than for staff (95% CI: staff=0.88, 1.56; dancer=1.74, 2.83, Wald test p=0.001). The social domain had a significantly stronger link to overall risk for dancers than staff (95% CI: staff=0.81, 1.36; dancer=1.19, 1.86, Wald test p=0.047).

Turning to measures of fit as a group, fit indices for the entire sample suggest that one latent construct fits the data well (Table III). SRMR values were well under the recommended cutoff as were CFI/TLI values. RMSEA values did not fall within the recommended cutoff below 0.06. But as Kenny et al. (31) point out, RMSEA bias may occur in models with a low number of cases or low degrees of freedom. Chi-square results did not suggest good fit for models with correlated (χ^2=4.549, p-value=0.033, df=1) errors between social and economic domains. The Chi square fit test, however, has been criticized as one that can sometimes over-reject adequate models (32).

Evaluation of fit by subgroup using chi-squared tests revealed that a one-factor risk model fit the dancer data well with correlated (χ^2=1.752) errors. For the staff-only model a one-factor model only fit the data well with correlated errors (χ^2=2.493). For the dancer models, RMSEA values fell within the recommended cutoff of < .06 while the staff model did not. SRMR values and CFI/TFI values were within acceptable ranges for both dancer and staff models, with the exception of TLI for the uncorrelated staff model (data not shown).

Invariance test statistics, comparing the parameter estimates between dancer and staff subgroups, are summarized in Table IV. Results of invariance testing of models with (models 1a/2a) and without correlated errors (models 1b/2b) are shown for comparison. With ($\Delta\chi^2$=9.96; Δd=3) or without ($\Delta\chi^2$=11.08; Δd=3) correlated errors, forcing the dancers' loadings and the staff's loadings to match in their respective models resulted in significantly poorer fit. Failure to achieve metric invariance suggests that dancers and staff linked the environmental domains to overall risk in different ways. As noted earlier, economics loomed larger for dancers and drugs for staff. These results confirm that these and other differences contribute to different constructions of broader risk.

Discussion

The “risk environment” framework is widely used to characterize the structural context in which HIV/STI risk is engendered among people who inject drugs and sex workers (5, 6, 9, 11). The current study is the first to examine the psychometric properties of a risk environment scale. We developed and validated an innovative measure that is internally consistent among dancers and other EDC employees. Through confirmatory factor analysis, we found that each of the four risk domains reflected a single, broader, latent risk factor of environmental risk. A number of tests supported our hypothesized differences between dancers' and staff's risk perceptions. Dancers' and staff's conceptualization of risk differed on key dimensions, reflective not only of their unique perspective but also of their divergent experiences within EDCs. As evidenced by the factor loadings stratified by employment group, staff viewed drug risks as most problematic while the dancers, who are on the receiving end of organizational pressures to make more money, considered economic matters as most troublesome. These distinctions indicate the importance of understanding the varied nature of risk perceptions and experiences of populations within the same physical environment. Such a nuanced understanding could inform tailored interventions that potentially are more impactful in targeting the specific, salient mechanisms that engender risk. In this case, the unique perspective on the environmental root causes of exotic dancers' HIV/STI risk within EDCs. The exotic dance space is a gendered space that reflect traditional power dynamics in the broader society. The club management, ownership, and other staff is predominantly although not exclusively male and all dancers are women. Bartenders and managers receive payments for all things sold in the clubs (e.g., alcohol, lap dances, time in private rooms for sexual activity). The risk experienced by exotic dancers occurs in the context of and is fueled by gender dynamics in which the majority of those who hold the financial and decision making power, such as employment termination, are men. Although we do not directly measure this, it is an important macro structural factor that operates within the EDCs and is related to dancers' risks. These traditional gender power dynamics are also played out by the fact that all of the customers who purchase sex and alcohol for themselves and for the dancers, are men. Although an analysis of the way gender operates in the EDC space is beyond the scope of the current study, it is an important exogenous construct that warrants further study.

The relationship (i.e. factor loadings) between each domain and the overall risk factor was different between the two groups as demonstrated by invariance testing, supporting our hypothesis of their different experiences. Further, this factor loading inequality signifies an

interaction and suggests that separate models for dancers and staff should be considered when creating composite scores. The study is the first to apply Rhodes' risk environment framework to develop a measure that directly quantifies the micro- and meso- HIV/STI risk environment. Although EDCs are a unique type of risk environment, the method for developing a quantitative risk environment measure to examine the structure and role of environmental domains could be useful in other settings, as well as instructive in developing related measures.

The overall scale was highly reliable as were the drug, economic, and social domains, which were all highly correlated with one another. The highest correlation was between economic and social domains, likely attributed to the innate social nature of economic transactions around sex within the EDCs. The items in the policy domain did not perform well in terms of having a modest reliability. Further, the policy domain was not correlated well with the other three domains, and had a low factor loading which indicated a low level of contribution to the overall scale. During the scale's development, the policy items were the most challenging to articulate given the consistent lack of policy within the EDCs. It is possible that policy items did not accurately reflect actual policies that may determine actual risk or how workers within EDC conceptualize risk. Policies were generally not expressed to dancers unless they were broken, and were extremely malleable depending on the manager on a given shift. Many of the statements overlapped with other domains (e.g., “the club has a set pay scale for services that dancers provide”) and were likely not tied to the club's risky nature (e.g., “dancers are expected to get customers to buy them drinks”). But given the role of policies, albeit often implicit, on risk behaviors, we included it in the final measure.

Policy implications from these findings include the need for explicit EDC-level policies from the onset of employment. However, implementation of the most effective recommendations is highly unlikely in reality given the illegality of a major source of income for many of the EDCs in our study – selling sex. Health promoting policies, such as expected condom use during transactional sex, could be employed if not specifically stated if, for example, condoms were readily available in all of the women's dressing rooms and private rooms in the clubs. This would effectively promote norms around condom use in the clubs, thereby tacitly creating an expectation of safe sex with both dancers and patrons.

The relationship between the observed domains and the latent risk factor was strong, as there was little variation in risk scores between the factor-based (observed) scores with estimated latent factor scores for evaluating overall club risk. Across the sample, the economic and social domains had the highest two factor loading scores, respectively. This indicates a high degree of association between the latent risk and these two domains. Analyses indicated that dancers and staff constructed risk differently including findings from the stratified CFA by employment type as well as the invariance testing, the latter of which determined that the construct's latent properties (e.g., factors, factor loading) reflected different characteristics between the two groups. In the stratified CFA analyses, the economic domain had the highest factor loading and percent variance explained for dancers, while the drug domain had the highest factor loading and percent variance explained for staff. The salience of these domains among dancers and staff are supported by our earlier qualitative and quantitative work in these EDCs (13-15, 34). In our previous qualitative study of 40 dancers and staff,

the majority expressed a strong expectation that dancers sell a range of sexual services, as it was the single most profitable EDC service for the dancers, staff, and management (13). The potential for HIV/STI risk was inextricably linked to the sale of sex, whereby women were paid based on the quantity of sexual services that they provided. While selling sex alone does not equate to HIV/STI risk, in this environment, barriers to safe sex were evident, thereby heightening the risk for women engaging in sex exchange. Condoms were sold for $1-$2 in most EDCs, although they were freely available at the needle exchange van, which parked on the street where the majority of clubs were located every Thursday evening. It is well accepted that an array of economic drivers facilitate many women and female sex workers' engagement in HIV/STI risk behaviors (35-38). In the context of drug use, economic necessity as a driver of HIV/STI risk is magnified. In the current study, among both staff and dancers, drugs were viewed as one of the largest contributing factors in women changing the boundaries of their engagement in risk behaviors. This is not to say that drugs were the only facilitator of risk, but given the cost of illicit drugs, staff supported statements around their use being associated with unsafe sex. Our previous qualitative research in this population as well as other literature among exotic dancers has identified the moving line in the sand of what women were “willing to do” in the context of a drug habit (13, 39).

Study findings should be viewed in light of several limitations. We collected data in 81% of EDCs in Baltimore City and County, limiting the study's findings to the remaining 20% given our lack of familiarity about the nature of their risk environments. Further, social desirability bias could have influenced the participants' responses to numerous questions regarding illegal activity, threatening the study's validity. This bias could have operated differently for staff compared to dancers, with staff having less incentive to be honest given that they both propagate and benefit from much of the illicit drug and sexual activity that occurs within the EDCs. This bias could have been mitigated by the collection of data on tablets as well as the anonymous nature of the surveys. The high levels of internal consistency together with the results of the factor analysis provide us with confidence in the study results' validity and reliability. Additionally, we did not sufficiently capture the relevant aspects of the club's policies that engender risk to FEDs, limiting this domain's utility in the overall risk profile. The lack of inclusion of EDC patrons is a study deficiency, as they are a key player in the EDCs' risk environment. Having their perception of the social, economic, drug and policy environments would have provided additional depth to our understanding of these dimensions and enhanced to the validity of the risk environment model. Lastly, there remain debates in the field surrounding the appropriate use of and cut off values for fit indices (25, 40).

This study possesses a number of strengths and contributes to a growing articulation of the nuanced and complex risk environment for populations at risk for HIV/STIs. Although based in Rhodes' risk environment framework, this type of scale is nimble and able to respond to the specifics of a given context (i.e., inclusion of a drug domain). Further, in addition to the scale's substantive contribution, data collection was novel and instructive. Brief anonymous surveys administered on a tablet were perceived as nonthreatening by both EDC management and potential participants, represented by the large proportion of EDCs to which we were given permission to collect data as well as a high response rate. The method

could be used in other risk settings including confined (e.g., massage parlors, bars) and outdoor (e.g., small geographic areas) settings. We used the scores resulting from this scale in a subsequent study phase, in which we ranked EDCs in order of risk to develop a sampling frame of high, middle, and low risk EDCs. We then recruited new exotic dancers from these EDCs to follow over time to understand the nature of exposure to the EDCs on their HIV/STI risk profile. The ranking was vital in our attempt to understand the full range of influence of these kinds of environments on dancers' risk profiles. Such a rapid assessment is not only useful in advance of a larger observation or intervention study, but could be used as a quick and inexpensive method to obtain the intervention's effects over time throughout the duration of the intervention.

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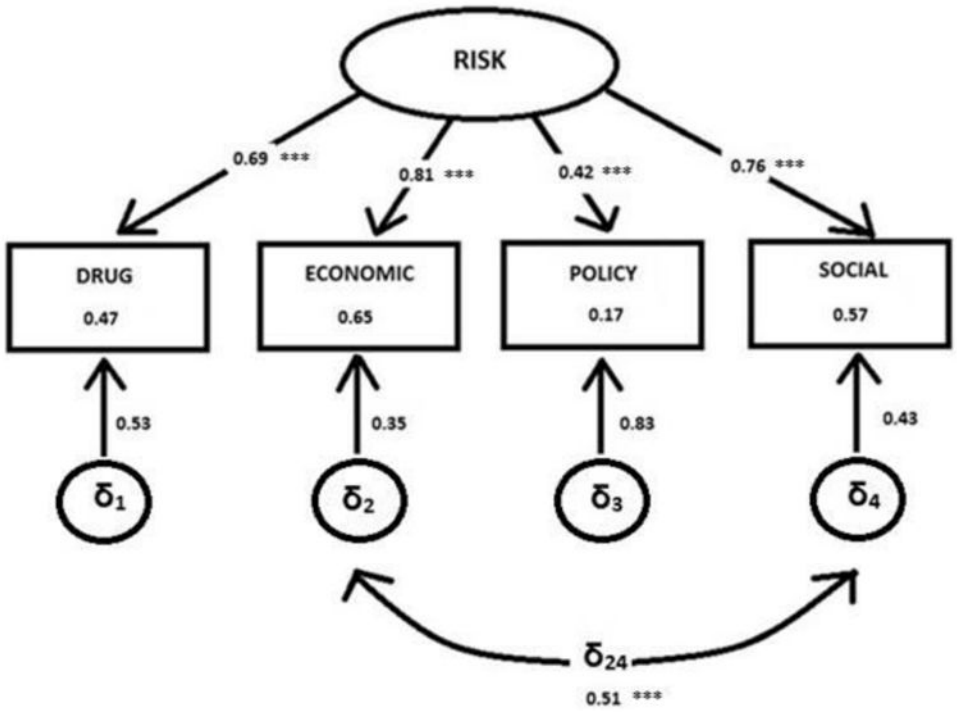

Figure 1.

Path diagram of confirmatory factor analysis EDC risk environment model, all dancers and staff (N=279).

Note. *** = $p < 0.001$

Table I

Cronbach's alpha and correlations across risk domains

Observed Domains (number of items)	Drug (n=13)	Economic (n=17)	Policy (n=8)	Social (n=19)
Drug	1	-	-	-
Economic	0.54**	1	-	-
Policy	0.26**	0.34**	1	-
Social	0.55**	0.79**	0.25**	1
Cronbach's α	0.82	0.93	0.65	0.86
SD	0.57	0.69	0.54	0.53

Note. Observed domains reflect the mean of standardized item scores.

** $p<0.01$.

Table II

Standardized loadings of risk domains on latent overall risk construct for dancer-only and staff-only models

	Dancers			Staff		
Risk domain (observed)	**λ**	**R^2**	**δ**	**Λ**	**R^2**	**Δ**
1. Drugs	0.58***	0.34	0.66	0.84***	0.71	0.29
2. Economic	0.91***	0.83	0.17	0.69***	0.48	0.52
3. Policy	0.41***	0.17	0.83	0.48***	0.23	0.77
4. Social	0.81***	0.66	0.34	0.70***	0.49	0.51

Note. Models shown included correlated errors (δ_{24}) between economic and social domain. Dancer standardized $\delta_{24} = 0.310$; staff standardized $\delta_{24} = 0.552$.

*** $p < 0.001$

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Table III

Goodness-of-Fit statistics for confirmatory factor analyses

Model	n	*df*	χ^2	$\Delta\chi^2$(df)	RMSEA	SRMR	CFI	TLI
All	279	2	6.762 *		0.092	0.027	0.977	0.930
All[a]	279	1	4.549 *	2.213(41)	0.113	0.023	0.983	0.896
Dancer	172	2	1.888		0.000	0.016	1.000	1.002
Dancer[a]	172	1	1.752	0.136(41)	0.066	0.015	0.995	0.969
Staff	107	2	6.553 *		0.146	0.049	0.934	0.803
Staff[a]	107	1	2.493	4.060(41) *	0.118	0.045	0.978	0.871

Note. RMSEA=root mean squared error of approximation; CFI= comparative fit index; TLI= Tucker-Lewis index; SRMR=standardized root mean square residual.

[a]Model with error covariance between social and economic domain.

*p<0.05.

Table IV

Fit indices for invariance tests.

Model	*df*	χ^2	$\Delta\chi^2$	*RMSEA*	*CFI*	*TLI*
Model 1a	2	4.245		0.090	0.990	0.937
Model 2a	5	14.204*	9.96*	0.115	0.957	0.897
Model 1b§	4	8.441		0.089	0.979	0.938
Model 2b§	7	19.522*	11.08*	0.113	0.942	0.900

Note. Model 1=unconstrained model; Model 2=constrained model

*p<0.05.

§Modeled without correlated errors between economic and social domains.

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