Supplementary information (including supplementary tables)

- **Final SPSI items and response options presented in Supplementary Table 6 below**

Data analysis

Preliminary analyses identified only mild-moderate univariate skewness values (<1.0) for the SPSI items (see Supplementary Table 1 for all items and Supplementary Table 2 for skewness values). As survey items were set as mandatory, there was no missing data. The athlete sample was randomly partitioned into an athlete calibration sub-sample (n=169) and an athlete validation sub-sample (n=168), using a random number generator. Sample demographics were evaluated using descriptive statistics. Exploratory factor analysis (EFA; principal axis factoring) with direct quartermin (delta=0) rotation was undertaken with data from the athlete calibration sample to identify the factor structure of the SPSI with data provided by the athletes. The item pool (see Supplementary Table 1) for the SPSI includes several negatively valenced items, which were reverse scored prior to analysis. Prior to factor extraction, parallel analysis was conducted to identify the number of underlying factors. The Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's test of sphericity were undertaken to examine factorability and measure of sampling adequacy (e.g., sufficient sample size), where >.60 is viewed as acceptable. Regarding retained item factor loadings, the cut-off of 0.32 is considered the minimum rule of thumb,[34] however, Comrey and Lee[35] indicate that as loadings of 0.32 reflect only 10% overlapping item variance they should be considered to load on the overarching factor poorly. We instead opted to retain loadings ≥0.56, reflecting 30% overlapping variance, which are considered a 'good' approximation of the overarching factor.[35,36] Any cross-loading or under-loading items ≤0.55 were omitted and the analysis reiterated, including parallel analysis. Tabachnick, Fidell and Ullman[36] argue that interpretation of factors with only two contributing variables can be hazardous, and are unlikely to report stable internal consistency, hence we retained only those factors with ≥3 items. Analyses were re-run until a final factor solution was identified absent of any cross-loading or poorly performing items.

Supplementary Table 1

Supplementary Table 2

Confirmatory factor analysis (CFA) was undertaken on data from the athlete validation sample and the coaches/HPSS according to the factor model established using the calibration sample. To account for the violation of multivariate normality (Doornik-Hansen $\chi^2(22)=176.17, p<.001$), maximum likelihood parameter estimates with standard errors and a mean- and variance-adjusted chi-square test statistic robust to non-normality was used (MLMV). Evaluation of model fit indices followed established guidelines;[37] χ^2 test of model fit can be inaccurate in samples <300 with non-normality and was interpreted with caution, RMSEA <.05 as indicating close fit as indicated by the associate *p*-close value, TLI and CFI ≥.90 for acceptable fit and ≥.95 for excellent fit, and SRMR ≤.08. Bi-factor analysis was subsequently undertaken to determine if the SPSI total score should be considered, based on model fit indices outlined above in addition to auxiliary fit indices; the estimated common variance index (ECV) ≥.70 (a conservative criteria), percentage of uncontaminated (PUC) variance ≥.70, and average relative parameter bias ≤.15[38] (ARPB) using methods outlined by Dueber[39]. Internal consistency for subscales of the SPSI were evaluated using Cronbach alpha (α) and McDonald omega (Ω) maximum likelihood coefficients, with coefficients ≥.70 indicting acceptable reliability.[40]

SPSI percentile distributions were examined separately for athletes and coaches/HPSS, with those scoring ≤25% quartile (e.g., low perceived psychological safety) examined on distress and wellbeing outcomes. Multivariate analysis of variance (MANOVA) with follow-up univariate tests examined mean differences between athletes and coaches on SPSI domains. Spearman correlations were examined between outcome variables. Generalised linear regression examining binary logistic models (α= .01, 99% odds ratios; OR's) explored the three SPSI domains as predictors of K10 (≥16) and APSQ (≥15) moderate distress cut-off thresholds. SPSS 26.0, and Mplus 8.2 were used for analyses.

Results

Internal consistency

Internal consistency coefficients for the three SPSI domains and total score were all in the satisfactory range (see Supplementary Table 3). For each SPSI subscale, omega coefficients were marginally higher than alpha coefficients. Coefficients were consistent across the athlete calibration and validation samples, and the coach / HPSS sample.

Supplementary Table 3

Percentile distribution and group differences

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Item distribution according to percentiles is displayed in Supplementary Table 4. Suggestive of higher mean scores, subscale and total scores at each percentile tended to be higher for coaches/HPSS relative to athletes. Athletes scoring below the 25th percentile for the SPSI total score (≤23) reported large effects for higher general distress (M=23.9, SD=10.5 versus M=16.3, SD=5.8, $t(36.9)$=4.05, p<.001, d=1.33), higher athlete-specific distress (M=22.6, SD=8.6 versus M=15.5, SD=5.4, $t(36.9)$=4.44, p<.001, d=1.46) and a medium effect for lower wellbeing (M=42.9, SD=9.4 versus M=50.4, SD=8.2, $t(163)$=4.48, p<.001, d=0.70). Similarly, coaches/HPSS scoring below the 25th percentile for the SPSI total score (≤27) reported a large effect for higher general distress (M=18.4, SD=5.9 versus M=14.9, SD=4.6, $t(80.8)$=4.09, p<.001, d=0.91) relative to coaches and HPSS at and above the 25th percentile (≥28).

Supplementary Table 4

Consistent with the percentile distribution, when SPSI subscale mean scores (see Supplementary Table 2) were examined in a MANOVA, a small multivariate effect was observed favouring higher scores for coaches/HPSS relative to athletes (Λ=.958, $F(3, 571)$=8.27, p<0.001, η^2=.042). Consistent with this, small univariate effects were observed for higher scores for coaches / HPSS on the three domains of Mentally Healthy Environment $F(1, 573)$=6.700, p=0.010, η^2=.012, Mental Health Literacy $F(1, 573)$=20.31, p<0.001, η^2=.034, and Low Self-Stigma $F(1, 573)$=9.68, p=0.002, η^2=.017.

Item-level endorsement

Descriptive statistics for the SPSI are presented in Supplementary Table 2. Overall, responses tended to be relatively favourable, with proportionally more respondents endorsing 'agree' or 'strongly agree' relatively to the disagree categories. Nonetheless, around 20-50% of respondents tended to indicate neutral / unsure responses, and responses for the Low Self-Stigma subscale items tended to be less favourably endorsed relative to the other subscales.

Convergent and divergent validity

Spearman correlations are reported in Supplementary Table 5. The three SPSI domains and total score were positively intercorrelated for both the athlete group and coaches / HPSS. SPSI domains positively correlated with wellbeing scores for athletes, demonstrating convergent validity. Negative associations were observed between SPSI domains and general psychological distress for both groups, demonstrating divergent validity. Athletes also exhibited negative correlations between athlete-specific distress and the SPSI domains.

See Supplementary Table 5

Supplementary Table 1: Full item pool for the SPSI

Please respond to the statements below in terms of how strongly you agree or disagree with each according to: **'**Strongly Disagree' (0), 'Disagree' (1), 'Neutral/Unsure' (2), 'Agree' (3) 'Strongly Agree' (4).

1. My sport setting is a safe space to disclose MH problems
2. My sport setting provides a supportive environment to disclose MH problems
3. Leadership staff in my sport take MH seriously
4. I would not be willing to make known my MH in my sport setting (r)
5. I have good knowledge of MH problems in sport settings
6. I know the MH signs I should keep an eye on in sport settings
7. If I experienced a MH problem, I would be aware of the symptoms
8. I know how to maintain good MH in the sport setting
9. Those in my sport setting would be supportive about MH problems
10. MH problems would reflect poorly on me in a sport setting(r)
11. I think that MH problems in sport settings communicate weakness(r)
12. I would think I'd failed if I experienced any MH problems(r)
13. It's better if I don't tell anyone about my MH problems(r)
14. In sport settings MH problems can be managed effectively
15. Seeking help for a MH problem is a good thing to do for anyone in a sport setting
16. I would be willing to actively seek help for a MH problem
17. If someone else in my sport has a MH problem, it's best to avoid them so I don't develop the problem(r)
18. I would be concerned that someone with MH problems would be dangerous or unpredictable(r)
19. If you make a mistake in my sport setting it's often held against you(r)
20. It is safe to take a risk in my sport
21. People in my sport sometimes reject others for being different(r)
22. No one in my sport would deliberately act to undermine my efforts
23. My unique skills and talents are valued and utilised in my sport
24. My sport setting provides a supportive environment for learning from mistakes/failure
25. It is difficult to ask others in my sport for help(r)

Note. (r)=reverse scored item

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Supplementary Table 2: Scale item and subscale descriptive statistics

	M(SD)	Skew	Strongly disagree % (n)	Disagree % (n)	Neutral / Unsure % (n)	Agree % (n)	Strongly agree % (n)
Athletes (n=337)							
Mentally Healthy Environments	10.21 (3.64)	-.671	–	–	–	–	–
My sport setting provides a supportive environment to disclose MH problems (2)	2.37 (1.08)	-.474	5.0 (17)	9.5 (32)	30.0 (101)	41.8 (141)	13.6 (46)
My sport setting is a safe space to disclose MH problems (1)	2.50 (1.01)	-.608	7.1 (24)	11.6 (39)	31.8 (107)	35.9 (121)	13.6 (46)
Leadership staff in my sport take MH seriously (3)	2.66 (1.06)	-.722	4.7 (16)	9.2 (31)	22.6 (76)	41.8 (141)	21.7 (73)
Those in my sport setting would be supportive about MH problems (9)	2.68 (0.95)	-.827	3.6 (12)	6.8 (23)	24.0 (81)	49.6 (167)	16.0 (54)
Mental Health Literacy	10.86 (2.87)	-.683	–	–	–	–	–
I know the MH signs I should keep an eye on in sport settings (6)	2.70 (0.90)	-.908	2.7 (9)	8.6 (29)	17.8 (60)	57.6 (194)	13.4 (45)
I have good knowledge of MH problems in sport settings (5)	2.68 (0.89)	-.605	1.8 (6)	8.0 (27)	26.4 (89)	48.4 (163)	15.4 (52)
If I experienced a MH problem, I would be aware of the symptoms (7)	2.78 (0.88)	-.697	1.2 (4)	8.0 (27)	20.8 (70)	51.9 (175)	18.1 (61)
I know how to maintain good MH in the sport setting (8)	2.71 (0.81)	-.739	1.5 (5)	5.6 (19)	25.8 (87)	54.9 (185)	12.2 (41)
Low Self-Stigma	7.37 (2.66)	-.391	–	–	–	–	–
I think that MH problems in sport settings communicate weakness (11r)	2.63 (1.14)	-.575	4.7 (16)	13.4 (45)	21.1 (71)	35.9 (121)	24.9 (84)
I would think I'd failed if I experienced any MH problems (12r)	2.74 (1,07)	-.604	2.7 (9)	12.8 (43)	19.9 (67)	37.7 (127)	27.0 (91)
MH problems would reflect poorly on me in a sport setting (10r)	2.01 (1.11)	-.071	9.2 (31)	24.9 (84)	29.7 (100)	28.2 (95)	8.0 (27)
Coaches / HPSS (n=238)							
Mentally Healthy Environment	10.95 (2.95)	-.837	–	–	–	–	–
My sport setting provides a supportive environment to disclose MH problems (2)	2.54 (0.90)	-.593	2.9 (7)	9.7 (23)	27.3 (65)	50.4 (120)	9.7 (23)
My sport setting is a safe space to disclose MH problems (1)	2.50 (0.90)	-.734	2.1 (5)	13.0 (31)	26.9 (64)	49.2 (117)	8.8 (21)
Leadership staff in my sport take MH seriously (3)	3.08 (0.84)	-1.055	1.7 (4)	2.1 (5)	15.1 (36)	48.7 (116)	32.4 (77)
Those in my sport setting would be supportive about MH problems (9)	2.83 (0.81)	-.839	1.7 (4)	3.4 (8)	22.3 (53)	55.5 (132)	17.2 (41)
Mental Health Literacy	11.85 (2.07)	-.069	–	–	–	–	–
I know the MH signs I should keep an eye on in sport settings (6)	3.03 (0.62)	-.526	0 (0)	2.1 (5)	11.8 (28)	67.6 (161)	18.5 (44)
I have good knowledge of MH problems in sport settings (5)	2.97 (0.68)	-.546	0 (0)	2.9 (7)	16.0 (38)	62.6 (149)	18.5 (44)
If I experienced a MH problem, I would be aware of the symptoms (7)	2.98 (0.68)	-.794	0.4 (1)	2.5 (6)	13.9 (33)	65.1 (155)	18.1 (43)
I know how to maintain good MH in the sport setting (8)	2.87 (0.66)	-.854	0 (0)	4.6 (11)	14.7 (35)	69.3 (165)	11.3 (27)
Low Self-Stigma	8.08 (2.66)	-.620	–	–	–	–	–
I think that MH problems in sport settings communicate weakness (11r)	2.97 (1.10)	-.1.010	2.9 (7)	11.3 (27)	9.7 (23)	37.4 (89)	38.7 (92)
I would think I'd failed if I experienced any MH problems (12r)	2.80 (1.07)	-.734	2.9 (7)	10.9 (26)	18.1 (43)	39.1 (93)	29.0 (69)
MH problems would reflect poorly on me in a sport setting (10r)	2.30 (1.10)	-.363	6.7 (16)	17.2 (41)	27.7 (66)	36.1 (86)	12.2 (29)

Note. r=items have been reversed so that higher scores indicate greater psychological safety.

Supplementary Table 3: SPSI internal consistency coefficients

	Calibration Sample (n=169)		Validation sample (n=168)		Coaches / HPSS (n=238)	
	α	Ω	α	Ω	α	Ω
Mentally Healthy Environment	.90	.90	.92	.92	.87	.88
Mental Health Literacy	.87	.88	.81	.83	.79	.80
Low Self-Stigma	.74	.75	.72	.75	.75	.75
SPSI Total Score	.86	.84	.80	.75	.82	.80

Supplementary Table 4: Percentile distribution of SPSI subscales and total score

	Min	5th	10th	25th	50th	75th	90th	95th	Max
				Range / Percentiles					
Athletes									
Mentally Healthy Environments	0	2	6	8	11	12	15	16	16
Mental Health Literacy	0	5	7	9	11	12	14	16	16
Low Self-Stigma	0	3	4	6	8	9	11	12	12
SPSI Total Score	4	16	19	24	29	33	37	38	44
Coaches / HPSS									
Mentally Healthy Environments	0	6	7	9	12	13	14	15	16
Mental Health Literacy	5	8	9	11	12	12	15	16	16
Low Self-Stigma	0	3	4	7	9	10	11	12	12
SPSI Total Score	11	21	23	28	31	34	37	41	44

Note. Possible score range is 0-16 for Mentally Healthy Environment and Mental Health Literacy; 0-12 for Low Self-Stigma; 0-44 for SPSI total score.

Supplementary Table 5: Spearman correlations between study outcomes

	1.	2.	3.	4.	5.	6.
1. Mental Healthy Environments	–	.263***	.417***	.780***	–	-.280***
2. Mental Health Literacy	.243***	–	.227***	.573***	–	-.188**
3. Low Self-Stigma	.319***	.282***	–	.769***	–	-.362***
4. SPSI Total Score	.768***	.619***	.705***	–	–	-.369***
5. Wellbeing (WEMWBS)	.398***	.344***	.335***	.493***	–	–
6. Psychological distress (K10)	-.371***	-.233***	-.279***	-.417***	-.680***	–
7. Athlete distress (APSQ)	-.360***	-.271***	-.311***	-.424***	-.627***	.786***

Note. ***=*p*<.001, **=*p*<.01; Athlete coefficients below the diagonal, coach / HPSS coefficients above the diagonal.

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Supplementary Table 6: The Sport Psychological Safety Inventory

Please respond to the statements below in terms of how strongly you agree or disagree with each according to: **'**Strongly Disagree' (0), 'Disagree' (1), 'Neutral/Unsure' (2), 'Agree' (3) 'Strongly Agree' (4).

	Strongly Disagree	Disagree	Neutral/ Unsure	Agree	Strongly Agree
1. My sport setting is a safe space to disclose MH problems	0	1	2	3	4
2. My sport setting provides a supportive environment to disclose MH problems	0	1	2	3	4
3. Leadership staff in my sport take MH seriously	0	1	2	3	4
5. I have good knowledge of MH problems in sport settings	0	1	2	3	4
6. I know the MH signs I should keep an eye on in sport settings	0	1	2	3	4
7. If I experienced a MH problem, I would be aware of the symptoms	0	1	2	3	4
8. I know how to maintain good MH in the sport setting	0	1	2	3	4
9. Those in my sport setting would be supportive about MH problems	0	1	2	3	4
10. MH problems would reflect poorly on me in a sport setting(r)	0	1	2	3	4
11. I think that MH problems in sport settings communicate weakness(r)	0	1	2	3	4
12. I would think I'd failed if I experienced any MH problems(r)	0	1	2	3	4

Note. (r)= item to be reverse scored

Scoring:

Mental Healthy Environment Subscale: Sum items 1, 2, 3, 9

Mental Health Literacy Subscale: Sum items 5, 6, 7, 8

Low Self-Stigma Subscale: Sum items 10r, 11r, 12r