

Supplementary Figure 1. ROC Curve Analyses of the Full Nomogram Model Incorporating NPS and Additional Prognostic Factors for Predicting 1-, 3-, and 5-Year Overall Survival.

ROC curve analyses evaluating the discriminatory performance of the full nomogram model, which incorporates the NPS along with age, BMI, tumor differentiation, AJCC stage, extranodal extension (ENE), and perineural invasion (PNI), for predicting overall survival (OS) at 1 year (a), 3 years (b), and 5 years (c). Each panel includes curves for both the development and validation cohorts.

Supplementary Table 1. Supplementary Table 1. CONUT score.

Supplementary Table 2. Univariable and multivariable Cox regression analyses of prognostic factors for DFS based on the mNPS.

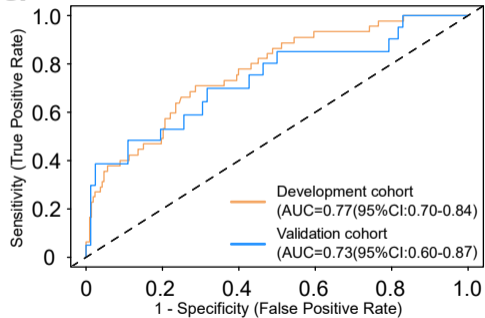
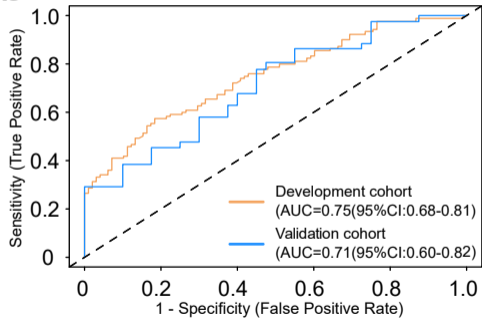
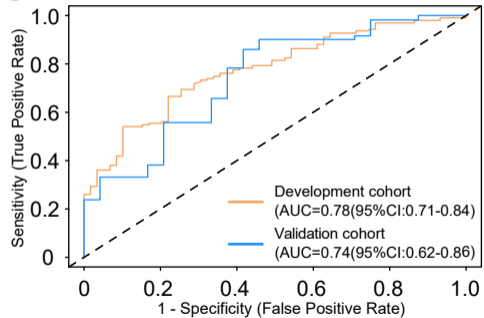
Supplementary Table 3. Univariable and multivariable Cox regression analyses of prognostic factors for DSS based on the mNPS.

Supplementary Table 4. Concordance index (C-index) of prognostic nomogram models incorporating mNPS or NPS for predicting OS, DFS, and DSS in development and validation cohorts.

Supplementary Table 5. Univariable and multivariable Cox regression analyses of prognostic factors for OS based on the conventional NPS.

Supplementary Table 6. Univariable and multivariable Cox regression analyses of prognostic factors for DFS based on the conventional NPS.

Supplementary Table 7. Univariable and multivariable Cox regression analyses of prognostic factors for DSS based on the conventional NPS.

a**b****c**

Supplementary Table 1. CONUT score

	Malnutrition			
	Absent 0-1	Mild 2-4	Moderate 5-8	Severe 9-12
Albumin, g/dl (score)	≥3.5 (0)	3.0-3.4 (2)	2.5-2.9 (4)	<2.5 (6)
Total cholesterol, mg/dl (score)	≥180 (0)	140-179 (1)	100-139 (2)	<100 (3)
Lymphocyte count, 10 ⁹ /L (score)	≥1.60 (0)	1.20-1.59 (1)	0.80 - 1.19 (2)	<0.80 (3)

Supplementary Table 2. Univariable and Multivariable Cox Regression Analyses of Prognostic Factors for Disease-free Survival in Patients with OSCC.

Characteristics ^a	HR(95% CI); P value	
	Univariate Analysis	Multivariable Analysis
Sex		
Female	Reference	
Male	0.86 (0.63 ~ 1.18);0.35	
Age		
<60 years	Reference	
≥60 years	1.37 (0.99 ~ 1.88);0.06	
BMI(kg/m ²)		
18.5-24	Reference	Reference
<18.5	1.69 (1.16 ~ 2.45);0.006	1.33 (0.90 ~ 1.97);0.145
≥24	1.40 (0.94 ~ 2.08);0.10	1.33 (0.88 ~ 2.01);0.172
Tobacco use		
NO	Reference	
Yes	1.18 (0.86 ~ 1.62);0.30	
Alcohol use		
NO	Reference	
Yes	0.82 (0.57 ~ 1.16);0.26	
Hypertension		
NO	Reference	
Yes	1.30 (0.91 ~ 1.85);0.16	
Diabetes		
NO	Reference	
Yes	1.38 (0.91 ~ 2.09);0.13	
Location		
Tongue	Reference	
Buccal mucosa	1.07 (0.72 ~ 1.58);0.74	
Gingiva	0.94 (0.57 ~ 1.54);0.79	
Lip	0.69 (0.39 ~ 1.23);0.21	
Other sites	0.59 (0.30 ~ 1.14);0.12	
Adjuvant treatment		
NO	Reference	Reference
Yes	1.65 (1.20 ~ 2.29);0.002	1.02 (0.68 ~ 1.52);0.93
Differentiation		
Well-differentiated	Reference	
Moderately differentiated	1.15 (0.80 ~ 1.67);0.45	
Poorly differentiated	2.04 (1.32 ~ 3.15);0.001	
AJCC stage		
I	Reference	Reference
II	2.00 (0.99 ~ 4.04);0.05	1.63 (0.80 ~ 3.34);0.18
III	2.72 (1.33 ~ 5.56);0.006	2.00 (0.93 ~ 4.33);0.08
IV	4.72 (2.28 ~ 9.77);<.001	2.51 (1.10 ~ 5.73);0.03
ENE		

Negative	Reference	Reference
Positive	3.06 (1.84 ~ 5.11);<.001	2.55 (1.36 ~ 4.77);0.003
DOI		
<10 mm	Reference	
≥10 mm	1.65 (1.20 ~ 2.29);0.002	1.57 (1.06 ~ 2.33);0.02
PNI		
Negative	Reference	Reference
Positive	1.38 (1.01 ~ 1.89);0.04	1.58 (1.14 ~ 2.20);0.006
CONUT score ^c		
<3	Reference	
≥3	1.19 (0.66 ~ 2.15);0.56	
mNPS		
Group 0	Reference	Reference
Group 1	1.93 (1.22 ~ 3.05);0.005	2.06 (1.26 ~ 3.34);0.004
Group 2	3.16 (1.96 ~ 5.08);<.001	3.03 (1.74 ~ 5.27);<.001
SII ^e ,	1.00 (1.00 ~ 1.00);0.95	
SIRI ^e ,	1.35 (1.11 ~ 1.65);0.003	1.08 (0.84 ~ 1.38);0.55

Abbreviations: BMI, body mass index; AJCC,American Joint Committee on Cancer;ENE,extranodal extension;DOI,Depth of invasion;PNI:Perineural invasion;SII:Systemic Immune-Inflammation Index;SIRI,Systemic inflammation response index;COUNT:Controlling nutritional status.

Supplementary Table 3. Univariable and Multivariable Cox Regression Analyses of Prognostic Factors for Disease-Specific survival in Patients with OSCC based on modified NPS

Characteristics ^a	HR(95% CI); P value	
	Univariate Analysis	Multivariable Analysis
Sex		
Female	Reference	
Male	1.04 (0.71 ~ 1.52);0.85	
Age		
<60 years	Reference	Reference
≥60 years	1.49 (1.02 ~ 2.18);0.04	1.60 (1.06 ~ 2.40);0.03
BMI(kg/m ²)		
18.5-24	Reference	Reference
<18.5	1.75 (1.13 ~ 2.72);0.01	1.43 (0.89 ~ 2.29);0.14
≥24	1.38 (0.85 ~ 2.23);0.19	1.26 (0.76 ~ 2.11);0.37
Tobacco use		
NO	Reference	Reference
Yes	1.50 (1.03 ~ 2.18);0.04	1.44 (0.95 ~ 2.16);0.08
Alcohol use		
NO	Reference	
Yes	1.00 (0.66 ~ 1.50);0.99	
Hypertension		
NO	Reference	
Yes	1.30 (0.85 ~ 1.98);0.23	
Diabetes		
NO	Reference	
Yes	1.21 (0.72 ~ 2.03);0.47	
Location		
Tongue	Reference	Reference
Buccal mucosa	1.40 (0.90 ~ 2.18);0.14	1.59 (0.99 ~ 2.56);0.05
Gingiva	1.25 (0.71 ~ 2.20);0.44	1.43 (0.77 ~ 2.65);0.25
Lip	0.33 (0.12 ~ 0.91);0.03	0.50 (0.17 ~ 1.42);0.19
Other sites	0.78 (0.37 ~ 1.64);0.51	1.27 (0.56 ~ 2.86);0.56
Adjuvant treatment		
NO	Reference	Reference
Yes	1.81 (1.22 ~ 2.68);0.003	1.27 (0.77 ~ 2.08);0.35
Differentiation		
Well-differentiated	Reference	Reference
Moderately differentiated	1.11 (0.71 ~ 1.74);0.64	0.99 (0.61 ~ 1.61);0.97
Poorly differentiated	2.19 (1.31 ~ 3.64);0.003	2.08 (1.18 ~ 3.67);0.01
AJCC stage		
I	Reference	Reference
II	1.40 (0.62 ~ 3.18);0.42	1.21 (0.52 ~ 2.83);0.66
III	2.35 (1.04 ~ 5.30);0.04	1.78 (0.73 ~ 4.39);0.21
IV	4.09 (1.81 ~ 9.23);<0.001	2.50 (0.96 ~ 6.51);0.06
ENE		

Negative	Reference	Reference
Positive	2.64 (1.48 ~ 4.72);0.001	1.95 (0.95 ~ 4.03);0.07
DOI		
<10 mm	Reference	Reference
≥10 mm	1.62 (1.11 ~ 2.37);0.01	1.18 (0.74 ~ 1.91);0.49
PNI		
Negative	Reference	Reference
Positive	1.81 (1.24 ~ 2.63);0.002	1.94 (1.29 ~ 2.93);0.001
CONUT score ^c		
<3	Reference	
≥3	0.95 (0.44 ~ 2.06);0.91	
mNPS		
Group 0	Reference	Reference
Group 1	1.67 (0.98 ~ 2.86);0.06	1.81 (1.01 ~ 3.26);0.048
Group 2	2.91 (1.68 ~ 5.05);<0.001	2.65 (1.36 ~ 5.18);0.004
SII ^e ,	1.00 (1.00 ~ 1.00);0.74	
SIRI ^e ,	1.35 (1.07 ~ 1.72);0.01	1.06 (0.77 ~ 1.46);0.71

Abbreviations: BMI, body mass index; AJCC,American Joint Committee on Cancer;ENE,extranodal extension;DOI,Depth of invasion;PNI:Perineural invasion;SII:Systemic Immune-Inflammation Index;SIRI,Systemic inflammation response index;COUNT:Controlling nutritional status.

**Supplementary Table 4. Concordance index (C-index) of Prognostic Nomogram Models
Incorporating mNPS or NPS for Predicting OS, DFS, and DSS in Development and Validation Cohorts**

		OS	DFS	DSS
conventional NPS	development cohort	0.70 (0.66 - 0.75)	0.69 (0.65 - 0.73)	0.71 (0.66 - 0.76)
	validation cohort	0.69 (0.61 - 0.77)	0.68 (0.61 - 0.76)	0.73 (0.66 - 0.80)
mNPS	development cohort	0.73 (0.69 - 0.78)	0.72 (0.68 - 0.76)	0.73 (0.68 - 0.79)
	validation cohort	0.74 (0.66 - 0.82)	0.71 (0.64 - 0.79)	0.76 (0.68 - 0.83)

Abbreviations: OS, Overall survival; DFS, disease-free survival; DSS, disease-specific survival.

Supplementary Table 5. Univariable and multivariable Cox regression analyses of prognostic factors for OS based on the conventional NPS

Characteristics ^a	HR(95% CI); P value	
	Univariate Analysis	Multivariable Analysis
Sex		
Female	Reference	
Male	1.01 (0.71 ~ 1.44);0.95	
Age		
<60 years	Reference	Reference
≥60 years	1.52 (1.07 ~ 2.15);0.02	1.64 (1.13 ~ 2.40);0.01
BMI(kg/m ²)		
18.5-24	Reference	Reference
<18.5	2.19 (1.47 ~ 3.27);<.001	1.94 (1.26 ~ 2.97);0.002
≥24	1.74 (1.13 ~ 2.69);0.01	1.60 (1.01 ~ 2.53);0.04
Tobacco use		
NO	Reference	Reference
Yes	1.46 (1.04 ~ 2.06);0.03	1.22 (0.84 ~ 1.76);0.30
Alcohol use		
NO	Reference	
Yes	0.99 (0.68 ~ 1.44);0.94	
Hypertension		
NO	Reference	
Yes	1.32 (0.89 ~ 1.94);0.17	
Diabetes		
NO	Reference	
Yes	1.42 (0.91 ~ 2.23);0.13	
Location		
Tongue	Reference	
Buccal mucosa	1.31 (0.86 ~ 2.00);0.21	
Gingiva	1.30 (0.77 ~ 2.19);0.32	
Lip	0.87 (0.47 ~ 1.63);0.66	
Other sites	0.77 (0.38 ~ 1.55);0.46	
Adjuvant treatment		
NO	Reference	Reference
Yes	1.48 (1.04 ~ 2.10);0.03	1.28 (0.83 ~ 1.97);0.27
Differentiation		
Well-differentiated	Reference	Reference
Moderately differentiated	1.22 (0.82 ~ 1.84);0.33	1.38 (0.90 ~ 2.13);0.14
Poorly differentiated	2.41 (1.52 ~ 3.83);<.001	2.41 (1.48 ~ 3.93);<.001
AJCC stage		
I	Reference	Reference
II	1.75 (0.83 ~ 3.71);0.14	1.61 (0.74 ~ 3.48);0.23
III	2.37 (1.11 ~ 5.06);0.03	2.03 (0.90 ~ 4.56);0.09
IV	3.74 (1.73 ~ 8.06);<.001	2.93 (1.27 ~ 6.73);0.01
ENE		

Negative	Reference	Reference
Positive	2.21 (1.24 ~ 3.93);0.007	1.69 (0.86 ~ 3.32);0.13
DOI		
<10 mm	Reference	
≥10 mm	1.26 (0.88 ~ 1.80);0.20	
PNI		
Negative	Reference	
Positive	1.59 (1.12 ~ 2.24);0.009	
CONUT score ^c		
<3	Reference	
≥3	0.90 (0.44 ~ 1.84);0.77	
NPS		
Group 0	Reference	Reference
Group 1	2.18 (1.33 ~ 3.57);0.002	2.03 (1.21 ~ 3.43);0.008
Group 2	3.30 (1.87 ~ 5.83);<.001	2.05 (1.04 ~ 4.05);0.04
SII ^c ,	1.00 (1.00 ~ 1.00);0.78	;
SIRI ^c ,	1.46 (1.18 ~ 1.80);<.001	1.21 (0.92 ~ 1.58);0.17

Abbreviations:HR:hazard ratio; BMI, body mass index; AJCC,American Joint Committee on Cancer;SII:Systemic Immune-Inflammation Index;SIRI: Systemic Inflammation Response Index;PNI:Prognostic Nutritional Index.

^cThe SII was computed as Platelet count×Neutrophil count/Lymphocyte count.

^dThe SIRI was derived using

^eThe PNI was calculated as $10 \times \text{Serum albumin (g/dL)} + 0.005 \times \text{Total lymphocyte count (cells/mm}^3)$

Supplementary Table 6. Univariable and Multivariable Cox Regression Analyses of Prognostic Factors for Disease-free Survival in Patients with OSCC based on original NPS

Characteristics ^a	HR(95% CI); P value	
	Univariate Analysis	Multivariable Analysis
Sex		
Female	Reference	
Male	0.86 (0.63 ~ 1.18);0.35	
Age		
<60 years	Reference	
≥60 years	1.37 (0.99 ~ 1.88);0.06	
BMI(kg/m ²)		
18.5-24	Reference	Reference
<18.5	1.69 (1.16 ~ 2.45);0.006	1.40 (0.95 ~ 2.06);0.09
≥24	1.40 (0.94 ~ 2.08);0.10	1.34 (0.89 ~ 2.03);0.16
Tobacco use		
NO	Reference	
Yes	1.18 (0.86 ~ 1.62);0.30	
Alcohol use		
NO	Reference	
Yes	0.82 (0.57 ~ 1.16);0.26	
Hypertension		
NO	Reference	
Yes	1.30 (0.91 ~ 1.85);0.16	
Diabetes		
NO	Reference	
Yes	1.38 (0.91 ~ 2.09);0.13	
Location		
Tongue	Reference	
Buccal mucosa	1.07 (0.72 ~ 1.58);0.74	
Gingiva	0.94 (0.57 ~ 1.54);0.79	
Lip	0.69 (0.39 ~ 1.23);0.21	
Other sites	0.59 (0.30 ~ 1.14);0.12	
Adjuvant treatment		
NO	Reference	Reference
Yes	1.65 (1.20 ~ 2.29);0.002	1.05 (0.70 ~ 1.56);0.82
Differentiation		
Well-differentiated	Reference	
Moderately differentiated	1.15 (0.80 ~ 1.67);0.45	
Poorly differentiated	2.04 (1.32 ~ 3.15);0.001	
AJCC stage		
I	Reference	Reference
II	2.00 (0.99 ~ 4.04);0.05	1.70 (0.83 ~ 3.49);0.15
III	2.72 (1.33 ~ 5.56);0.006	2.10 (0.97 ~ 4.53);0.06
IV	4.72 (2.28 ~ 9.77);<0.001	2.79 (1.23 ~ 6.35);0.01
ENE		

Negative	Reference	Reference
Positive	3.06 (1.84 ~ 5.11);<0.001	2.43 (1.30 ~ 4.52);0.005
DOI		
<10 mm	Reference	
≥10 mm	1.65 (1.20 ~ 2.29);0.002	1.49 (1.01 ~ 2.20);0.05
PNI		
Negative	Reference	Reference
Positive	1.38 (1.01 ~ 1.89);0.04	1.52 (1.09 ~ 2.11);0.01
CONUT score ^c		
<3	Reference	
≥3	1.19 (0.66 ~ 2.15);0.56	
NPS		
Group 0	Reference	Reference
Group 1	1.76 (1.16 ~ 2.68);0.008	1.75 (1.12 ~ 2.74);0.01
Group 2	2.49 (1.51 ~ 4.10);<0.001	1.89 (1.05 ~ 3.41);0.03
SII ^e ,	1.00 (1.00 ~ 1.00);0.95	
SIRI ^e ,	1.35 (1.11 ~ 1.65);0.003	1.19 (0.93 ~ 1.52);0.16

Abbreviations: BMI, body mass index; AJCC,American Joint Committee on Cancer;ENE,extranodal extension;DOI,Depth of invasion;PNI:Perineural invasion;SII:Systemic Immune-Inflammation Index;SIRI,Systemic inflammation response index;COUNT:Controlling nutritional status.

Supplementary Table 7. Univariable and Multivariable Cox Regression Analyses of Prognostic Factors for Disease-Specific survival in Patients with OSCC based on original NPS

Characteristics ^a	HR(95% CI); P value	
	Univariate Analysis	Multivariable Analysis
Sex		
Female	Reference	
Male	1.04 (0.71 ~ 1.52);0.85	
Age		
<60 years	Reference	Reference
≥60 years	1.49 (1.02 ~ 2.18);0.04	1.64 (1.08 ~ 2.47);0.02
BMI(kg/m ²)		
18.5-24	Reference	Reference
<18.5	1.75 (1.13 ~ 2.72);0.01	1.43 (0.89 ~ 2.29);0.14
≥24	1.38 (0.85 ~ 2.23);0.19	1.26 (0.76 ~ 2.11);0.37
Tobacco use		
NO	Reference	Reference
Yes	1.50 (1.03 ~ 2.18);0.04	1.41 (0.94 ~ 2.12);0.10
Alcohol use		
NO	Reference	
Yes	1.00 (0.66 ~ 1.50);0.99	
Hypertension		
NO	Reference	
Yes	1.30 (0.85 ~ 1.98);0.23	
Diabetes		
NO	Reference	
Yes	1.21 (0.72 ~ 2.03);0.47	
Location		
Tongue	Reference	Reference
Buccal mucosa	1.40 (0.90 ~ 2.18);0.14	1.54 (0.96 ~ 2.48);0.08
Gingiva	1.25 (0.71 ~ 2.20);0.44	1.29 (0.69 ~ 2.39);0.42
Lip	0.33 (0.12 ~ 0.91);0.03	0.50 (0.17 ~ 1.44);0.20
Other sites	0.78 (0.37 ~ 1.64);0.51	1.07 (0.48 ~ 2.42);0.86
Adjuvant treatment		
NO	Reference	Reference
Yes	1.81 (1.22 ~ 2.68);0.003	1.30 (0.78 ~ 2.16);0.31
Differentiation		
Well-differentiated	Reference	Reference
Moderately differentiated	1.11 (0.71 ~ 1.74);0.64	1.10 (0.67 ~ 1.79);0.71
Poorly differentiated	2.19 (1.31 ~ 3.64);0.003	2.12 (1.20 ~ 3.76);0.01
AJCC stage		
I	Reference	Reference
II	1.40 (0.62 ~ 3.18);0.42	1.23 (0.52 ~ 2.88);0.64
III	2.35 (1.04 ~ 5.30);0.04	1.83 (0.75 ~ 4.48);0.19
IV	4.09 (1.81 ~ 9.23);<0.001	2.69 (1.04 ~ 6.96);0.04
ENE		

Negative	Reference	Reference
Positive	2.64 (1.48 ~ 4.72);0.001	1.83 (0.89 ~ 3.75);0.10
DOI		
<10 mm	Reference	Reference
≥10 mm	1.62 (1.11 ~ 2.37);0.01	1.16 (0.72 ~ 1.87);0.54
PNI		
Negative	Reference	Reference
Positive	1.81 (1.24 ~ 2.63);0.002	1.84 (1.21 ~ 2.79);0.004
CONUT score ^c		
<3	Reference	
≥3	0.95 (0.44 ~ 2.06);0.91	
NPS		
Group 0	Reference	Reference
Group 1	2.13 (1.25 ~ 3.63);0.006	2.01 (1.13 ~ 3.59);0.02
Group 2	3.21 (1.73 ~ 5.95);<0.001	2.19 (1.03 ~ 4.64);0.04
SII ^e ,	1.00 (1.00 ~ 1.00);0.74	
SIRI ^e ,	1.35 (1.07 ~ 1.72);0.01	1.12 (0.82 ~ 1.55);0.48

Abbreviations: BMI, body mass index; AJCC,American Joint Committee on Cancer;ENE,extranodal extension;DOI,Depth of invasion;PNI:Perineural invasion;SII:Systemic Immune-Inflammation Index;SIRI,Systemic inflammation response index;COUNT:Controlling nutritional status.